Eureka County
Summary of DOE’s Yucca Mountain Final EIS Comment-Response Document:

Comments of Eureka County participants
DOE responses
County responses

Prepared for the
Board of Eureka County Commissioners
and the Eureka County Yucca Mountain Information Office

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1. Introduction

In February 2002, the U.S. Department of Energy (DOE) released the Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada. Included in this Final Environmental Impact Statement (EIS) is a Comment-Response Document, which consists of DOE’s responses to comments it received on the Draft EIS and Supplement to the Draft EIS.

One of the proposed rail routes that could be used to transport nuclear waste to a Yucca Mountain repository passes through Eureka County; the repository project could therefore affect the County’s residents and landowners. Recognizing how their homes and livelihoods could be changed by the construction and operation of such a rail line, many Eureka County residents and property owners submitted comments on both the Draft and Supplemental Environmental Impact Statements. Written comments were submitted by mail, fax, and email. Oral comments were given at two hearings held in Crescent Valley in 1999.

The following document assembles both the oral and written comments given by Eureka County residents and hearing participants, as well as DOE’s responses to those comments. DOE’s responses are then analyzed for their adequacy in addressing the issues raised by the commenters. The purpose of this document is therefore twofold: it serves to make DOE’s responses more accessible and manageable for Eureka County commenters, as well as to provide an official assessment of DOE’s responses for the record.
2. Executive Summary

Eureka County commenters voiced their concerns on a variety of issues. Chief among the subjects raised in their comments is the issue of nuclear waste transportation. Commenters were concerned about all aspects of the proposed rail route, including its effects on health and human safety, the County’s economy, and the surrounding environment. The possibility of accidents and the corresponding emergency response activities were also subjects of concern regarding transportation.

Additionally, commenters weighed in on a variety of other subjects relating to the proposed Yucca Mountain repository. Many voiced their general opposition to the project. Native American commenters expressed a desire to be allowed a more meaningful role in the process. Some commenters brought up legal and policy issues, questioning DOE’s adherence to National Environmental Policy Act (NEPA) and Nuclear Waste Policy Act (NWPA) regulations. Others commented on the EIS process and the inadequacy of the No-Action Alternatives included in the document. Still others pointed out flaws in the repository design and found fault with the analysis of cumulative impacts in the Draft EIS.

DOE responded to all comments, including those by Eureka County residents, in the Comment-Response Document of the Final EIS. Unfortunately, DOE did not respond to each comment individually. In the majority of cases, DOE grouped a number of comments into one statement and addressed all of them with a blanket summary response. While this methodology streamlined the task at hand – DOE received over 11,000 comments on the Draft EIS alone – it repeatedly resulted in incomplete and inadequate responses to the often complex questions and critiques posed by Eureka County commenters.

Conversely, because DOE often addressed a wide range of comments in a single response, the responses frequently contained information unrelated to the remarks of Eureka County commenters. For the purposes of the following document, DOE’s responses have been edited to remove material irrelevant to the comments of Eureka County residents. Responses that have been altered in this manner are denoted as “excerpts.”

DOE gave detailed responses to many comments and often referenced the appropriate sections in the Final EIS document to direct the reader to further information. However, there are a multitude of issues upon which both the Final EIS and DOE’s statements in the Comment-Response Document are inadequate. Among the most important deficiencies pointed to in following document:

- **Mitigation.** DOE made no concrete decisions on any measures to mitigate the impacts of the construction and operation of a Yucca Mountain repository. Possible mitigation measures were suggested in the EIS, but no specific, feasible mitigation actions were disclosed in the final document. DOE has stated that such decisions will not be made prior to additional environmental studies; however, these studies are only to be undertaken in the event that the rail route is designated as the preferred alternative. Many issues important to Eureka County commenters, such as grazing, rights-of-way and compensation for the taking of private land, therefore currently remain unresolved.
Executive Summary

- **Selection of transportation routes and mode.** Many commenters stated that the Draft EIS contained inadequate information on which to base transportation decisions. However, without any significant additions to the original transportation information analyzed in the Draft EIS, DOE has chosen rail as its preferred transportation alternative in the final document. Additionally, DOE has stated its intent to designate a rail corridor without further study or impact analysis of the five candidates, despite the many comments pointing to the inadequacies of the current level of analysis.

- **Emergency Response.** County officials and residents expressed concern over the short time allotted for emergency response and management training, as well as DOE’s failure to disclose any specific information on how emergency response will be made feasible in a rural area with scarce resources such as Eureka County. However, DOE failed to adequately expand upon this issue in the Final EIS or the Comment-Response Document.

- **Accident scenarios.** The possibility for an accident involving a nuclear waste shipment was of great concern to commenters. Yet, despite calls for a more thorough analysis of the impacts of such an accident, DOE did not in the Final EIS examine the possibility of contamination of surface or groundwater, nor employ area-specific atmospheric conditions to calculate exposure rates. Instead, in both the Final EIS and the Comment-Response Document, DOE repeatedly asserts that, while reasonably foreseeable, the chances of such an accident occurring are very unlikely.

- **Economic impacts.** At the request of commenters, DOE has slightly expanded its discussion of economic stigma effects of a repository in the Final EIS. Unfortunately, instead of analyzing potential economic impacts specific to Eureka County, DOE lumped Eureka, Lander, and Esmeralda Counties into a single category titled the “Rest of Nevada.” This categorization is dismissive to the unique qualities of the Eureka County economy and fails to meaningfully address the questions raised by Eureka County commenters.

- **Unreasonable No-Action Alternatives.** A significant number of commenters voiced their concerns over the lack of reasonable alternatives analyzed in the Draft EIS. However, despite these comments and contrary to NEPA regulations, DOE has not altered the No-Action Alternatives against which the Proposed Action is measured.

The above subjects represent only an overview of the ways in which DOE’s responses have proved insufficient in addressing the concerns of the Eureka County residents who may be affected by a Yucca Mountain repository. While DOE has slightly expanded its analysis of various issues raised by commenters, there are many areas in which the Final EIS remains nearly as inadequate as the Draft.

The following document serves to identify the issues specifically raised by the residents, landowners, and officials of Eureka County and to assess DOE’s responsiveness to them. In the County responses to DOE’s responses, the areas in which DOE has failed to adequately and
meaningfully address the concerns of the commenters are highlighted, and requests for further study and consideration respectfully made.

3. How to Use this Document

The comments and responses in this document are arranged by subject area. Each comment or series of comments made by a Eureka County resident, property owner, official, or hearing participant is followed by DOE’s response. Each of DOE’s responses, in turn, is followed by the County’s appraisal of the response, labeled “Response to DOE Response.”

In order to find a comment by a particular individual, locate the name of the commenter in the alphabetical index at the end of this document. Each name in the index is followed by the page number(s) where the comments of that individual are located.

In this document, the text of each comment is followed by both the name of the commenter and the reference number assigned to that particular comment by DOE. Each DOE response includes the index number DOE used to organize its responses in its Comment-Response Document.

Comments and responses can be located in DOE’s original Comment-Response Document using the names of the commenters and the numerical index numbers assigned to DOE’s responses. Unlike in this document, the actual text of the comments is not given in DOE’s Comment-Response Document. DOE’s document contains only brief summaries of the comments and DOE’s responses to them. However, the original letters, public hearing transcripts, emails, and other documents that constitute the comments given by the public are available for viewing on DOE’s Yucca Mountain Project website, http://www.ym.gov, or on the compact disk version of the Final Environmental Impact Statement.

To request an electronic or hard copy of the Final EIS, which includes the four-volume Comment-Response Document, contact:

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The Final EIS is also available online, at http://www.ym.gov.

4. Transportation

a. General Impacts

Comment:
One Eureka County commenter believed the construction of a rail line might limit access to a road used to find places to cut commercial firewood. This commenter stated, “Firewood sales are our supplemental income, plus our way of showing that this land can be used, but not abused. We do not need more of our land taken out of production by [the building of] a new railroad.” (Barbara Dugan, EIS000882/02)

Another Eureka County resident expressed concern over how the proposed project might affect the water supply in the County. The commenter wondered about the grazing allotments and water rights of the ranchers and the loss of rangeland that would result from a rail route through the County to Yucca Mountain, feeling that these issues were not adequately addressed in the Draft EIS. (Joseph Carruthers, EIS000623/04)

The Eureka County Planning Commission also weighed in on this issue: “Over the years Eureka County has granted or approved numerous parcel maps through this particular rail corridor, some of the most heavily parcelled areas in the county. Almost virtually all these parcels are sold to either people that are living on them or people that plan to retire here. This thing, should this Beowawe to Yucca Mountain route be selected, it would devastate these people.

“Also with this rail line crossing through the valley, the numerous access roads that are here now, obviously, it wouldn’t be financially able to – you wouldn’t be able to financially build all the crossings, nor would [it] be safe to have that many crossings. So many of these lands would be locked out, unavailable for access, it would be considered to be almost takings.” (Ronald Rankin, EC Planning commission, EIS000631/01)

Another commenter stated, “We have purchased property in Crescent Valley. Within time we plan to build and live in that beautiful valley. We would surely be disappointed if the waste goes through or near my property. We don’t have many places left on the West Coast that are free of pollution. California is overcrowded with people, fresh air is unheard of. That is why we love [the] Crescent Valley area.” (Henry T. Runge, EIS001197/04)

On the same subject, an additional commenter stated, “I live in Crescent Valley, the area proposed to build a rail site across Nevada to Yucca Mt., and the DOE still has not researched the safety risks involved in shipping this material across the country through our area and more populated areas as well.” (Donna M. Woods, EIS001945/08)

All of the above comments were addressed in the summary response below.

DOE 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 populations 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.

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 containers (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 are 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 al. 2000, all). 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 reports potential consequences for accidents that could release radioactive materials.

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 shipments. 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 to Yucca Mountain, it does not anticipate that an accident would lead to a release of radioactive materials from a shipping cask. Nevertheless, the 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, the 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 (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. 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; socioeconomics; 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 any 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 Sections 6.3.2 and 6.3.3 of the EIS). For example, in the Garden Valley west of Pioche in 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 (0.31 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 minimize land-use impacts and would avoid private land to the maximum possible extent. 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-the-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 or 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 or stigma in this Final EIS.

Response to DOE Response:
Because DOE responded to 125 comments in this one statement, almost none of the specific concerns raised by the Eureka County residents were adequately addressed, if even mentioned at all. While DOE has expanded its analysis of the safety issues inherent in transporting thousands of metric tons of highly radioactive nuclear waste through Nevada to Yucca Mountain, DOE did not, in this response, specifically address the issues raised by the citizens of Eureka County. These issues include the impediments to road access that a rail line may entail; the possible contamination of the water supply in Crescent Valley, which could be caused by an accident involving nuclear waste; the issue of railroad crossings; and the impact of land withdrawal for a rail line would on grazing allotments and private property in Eureka County. DOE should not
only directly address these possible impacts, but also propose feasible mitigation measures to counteract them.

Comment:
One commenter noted, “There’s also the problem that the amount of materials that you are talking about moving will actually have reached its peak. We will have this 70,000 tons of material by the time you’re actually trying to open the doors down there. So we’ll again be in the same problem with reactors all over the United States producing these kind of materials, stacking them up everywhere, and at the same time, we will have exposed 50 million people along the rail routes and the highways. We will have exposed 43 states. We will have exposed many so far clean areas, such as this one, and we’ll have the same problem. And yet we’ll have all this material shoved in the ground where there is nothing we can do to monitor it or take care of problems as they occur.” (Jennifer Olaranna Viereck, EIS000622/13)

DOE Response 1.1 (2229):
The NWPA prohibits the Nuclear Regulatory Commission from authorizing the emplacement of more than 70,000 metric tons of heavy metal (MTHM) of spent nuclear fuel and high-level radioactive waste in the proposed repository until a second repository is in operation. Therefore, a site for a second repository could be considered in the future regardless of where the first repository would be located. However, in response to comments received during the EIS scoping period (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 as part of the Cumulative Impacts discussion (see Chapter 8). The introduction to 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.

During the period starting with emplacement of materials and extending until closure (which could be as long as more than 300 years), DOE would monitor the repository continuously through a system of sensors and administrative inspections (see Section 2.1.2 of the EIS). This would give future decisionmakers the option to take corrective actions, if required, and make societal choices on closing the repository or retrieving material.

Section 122 of the NWPA requires DOE to maintain the ability to retrieve the materials in the repository if there was a decision to retrieve them to protect public health and safety or the environment or to recover constituent parts of spent nuclear fuel. This requirement is reflected in the Nuclear Regulatory Commission’s disposal regulations [10 CFR 63.111(e)]. Although DOE does not anticipate that retrieval would be necessary, it would use the repository design to maintain the ability for future generations to retrieve materials for at least 50 years and possibly for as long as 300 years after emplacement operations have begun (see EIS Section 4.2). The Federal Government, therefore, would maintain stewardship of the repository site for generations to come. These stewardship activities would entail site protection, confirmatory scientific work, and a postclosure monitoring program required by Nuclear Regulatory Commission rules governing the disposal of high-level wastes in a geologic repository (10 CFR 63.51). The decision to close the repository (and thus give up active control) and the details of the
postclosure monitoring program would be defined during the processing and approval of a license amendment for permanent closure, supported by what more advanced analyses based on future data and modeling tools. Section 2.1.2 discusses the types of monitoring that DOE would consider.

**Response to DOE Response:**
While it is acknowledged that DOE may monitor and retrieve the nuclear waste, once stored in Yucca Mountain, for up to 300 years, it must also be noted that for the remainder of the 10,000 year period there will be no institutional control over this highly radioactive waste. If a problem were to occur in this much longer stretch of time, to which the commenter was most likely referring, there would be no recourse. Additionally, the commenter has correctly pointed out that a Yucca Mountain repository would not completely solve the problem of nuclear waste disposal and urges the DOE to address the larger picture. Unfortunately, DOE did not respond to this request, choosing instead to take refuge in the Nuclear Waste Policy Act.

**Comment:**
Many Eureka County residents indicated that the analysis of transportation impacts in Nevada, as detailed in the Draft EIS, is insufficient for making modal, corridor and route decisions. Residents of the County also voiced their concern that the floodplain analysis contained in the Draft EIS is “insufficient for corridor and route selections.”

One commenter stated specifically, “Since the origins and destination of the nuclear waste are known, the Department should have identified specific routes in the draft which would have informed communities along the country or throughout the country of the Department’s plans. This draft is not adequate to make an informed decision on modes and routes, even though the Department states that they intend to make routing decisions based only on the information in this draft.” (Sandy Green, EIS000619/07)

**DOE Response 3.2(59): excerpts**
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 intermodal transfer station or the need to upgrade heavy-haul truck routes, would require additional field surveys; State, local, and Native American government consultations; environmental and engineering analyses; and National Environmental Policy Act reviews.
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 describes 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 nonradiological 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.

**Response to DOE Response:**
Despite the many comments received on this subject, the Final EIS, as well as the Draft EIS, failed to identify specific routing decisions for the transportation of nuclear waste. If indeed making such decisions would “require additional field surveys; State, local, and Native American government consultations; environmental and engineering analyses; and National Environmental Policy Act reviews,” than DOE should have performed such analyses before the release of the Final EIS and the recommendation of the Yucca Mountain site to the president. Because these analyses were not undertaken during the EIS process and the corresponding transportation decisions were not made, the Final EIS, as well as the response to the above comments, is therefore inadequate.
Further, this response does not address the issue — specifically raised in the above comments by Eureka County residents — of the inadequate floodplain analysis contained in the Draft EIS. Researching the subject in the Final EIS document yields a slightly expanded discussion of the floodplain in the vicinity of the Carlin Corridor. The Final EIS notes, for example, that the Monitor Valley alternative for the Carlin Corridor would increase by four the number of 100-year flood zones crossed and that “impacts associated with altering drainage patterns or changing erosion or sedimentation rates or locations would be minor and localized (p. 6-108).”

However, the Final EIS offers no data or justification that the impacts of altering erosion rates and locations and drainage patterns would be “minor and localized.” DOE also admits that the Final EIS does not specifically analyze the possibility of a spill and potential contamination of surface water, since analyses have consistently shown that the airborne pathway has the greatest potential for exposing large numbers of people to radioactive material in the event of a transportation accident (p. CR8-434). Though surface water contamination may be categorized by DOE as unlikely, it is still well within the realm of possibilities and therefore should be analyzed. As shown in the comments above, Eureka County residents are concerned about this issue, and without an adequate analysis or proposal of mitigation measures, the Final EIS cannot, from their perspective, be considered adequate.

Comment:
“Here are a few of the issues not even addressed in the DEIS on the Carlin route in regard to Crescent Valley:

• Lifestyle – Social, economic, and quiet enjoyment of your property.
• Wildlife – Wildlife corridors, range areas, viewing, rearing, grazing and hunting impacts.
• Ranchers – Cattle ranging, rearing, feeding, security.
• Water/Floodplains – No mention of lake bed at Crescent Valley. Flash flooding, washouts, culverts, bridges, dam effect of railroad and impact of backup water to Crescent Valley town and valley landowners.
• Earthquake – Is lakebed or valley soil subject to the liquefaction effect in case of earthquake? Note associated railroad impacts.
• Railroad Ownerships – Who will own railroad? Who will own the land?
• Mitigation – For all of the above must be stated.” (Curtiss L. Eckhardt, EIS000254/04)

DOE Response 8.3.1 (1014):
In its evaluation of potential impacts of constructing a branch rail line in each rail corridor in Nevada, DOE considered the potential impacts that could occur both to the natural environment and to communities, such as Crescent Valley, that would be nearby (see Section 6.3.2 of the EIS). For example, in the Carlin Corridor, DOE identified numerous springs within 5 kilometers (3 miles) of the alignment of a potential 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 (3 miles) south of Interstate-80. DOE would locate the alignment of a branch rail line to minimize the potential to affect springs and wet areas. 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 its assessment of potential land-use impacts, DOE considered the differences between land-use types, land disturbances, land ownership, and the creation of barriers. The assessment compared proposed uses of land for Yucca Mountain transportation purposes to existing or other proposed land uses to estimate the magnitude and context of potential conflicts. If an action would result in continuing a current land use either due to little or no impact or through mitigation, the effects were considered insignificant or small. For example as discussed in Chapter 6, the impacts to livestock and Bureau of Land Management grazing allotments could be mitigated through the use of fencing, overpasses, and underpasses, which could provide a water source to animals cut off from current sources. With these mitigating measures, the impacts would be lessened and considered small. If an action could result in departures from existing uses, and mitigation could not remedy the conflict, the effects could be more substantial. For example, as discussed in the Carlin Corridor sections of Chapter 6 (see Section 6.3.2.2.2), the Bonnie Claire Alternate passes directly through the portion of the newly estimated Timbisha Shoshone Homeland near Scottys Junction. Should this alternate be chosen, the construction of a branch rail line could limit or enhance economic development in the Timbisha Shoshone Trust Lands parcel and could limit the use for housing be restricting access. Factors considered included the uniqueness of a geographic area; presence of historic, scientific, and cultural resources; potential effects on endangered species; and compliance with Federal, State, or local law. Based on information available, potential land-use impacts associated with Yucca Mountain transportation activities could be minimized through judicious alignment of the branch rail line or through mitigation. Overall, the land-use impacts are not substantial because of the use of various optional and alternate routes in the corridor, mitigation measures, and the judicious routing of the branch rail line in the corridor.

Additional information about impact reduction features, procedures, and safeguards, and mitigation measures under consideration are included in Chapter 9 of the EIS. Chapter 9 identifies ongoing studies that could eventually influence mitigation measures related to the project plan and design. For example, Section 9.3 discusses mitigation measures intended to address impacts from the possible construction of a branch rail line.

If the Yucca Mountain site was approved, and rail was selected as the transportation mode, 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 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.

**Response to DOE Response:**

DOE’s response to the comment of this Eureka County resident is inadequate in its failure to address several of the issues raised in the comment, such as noise pollution and impacts on hunting and water sources. The response also veers into a lengthy example regarding the Timbisha Shoshone Homeland instead of focusing on the impacts the proposed rail line would have in the commenter’s stated area of interest: Crescent Valley.

Additionally, DOE’s above statement that “[o]verall, the land-use impacts are not substantial,” is an inadequate summation of the potential disruptions inherent in construction and operation of the proposed rail line, as well as unresponsive to the many concerns expressed in the above comment by a Eureka County resident. The impacts associated with the Carlin route cannot be quantified in this way when adequate analyses of the corridor and surrounding physical environment have not yet taken place.

DOE’s reliance on suggested or possible future mitigation measures instead of the identification and disclosure of specific, feasible mitigation plans is inadequate. Decisions on fencing, underpasses, and overpasses must be made before DOE can dismiss potential impacts to wildlife and the physical environment on the basis that they will be rendered “insignificant or small” through mitigation.

Specific mitigation measures should have been included in the Final EIS; Eureka County recognizes this omission as a significant deficiency in the document. DOE is reminded that, according to the National Environmental Policy Act, mitigation measures must be discussed for all impacts, even those that by themselves would not be considered significant. All relevant, reasonable mitigation measures that could reduce the impacts of the Proposed Action must be identified (Forty Questions No. 19). DOE’s reliance on future studies to identify impacts and mitigation measures does not qualify as adequate mitigation under NEPA.

**Comment:**

A statement given by a County Commissioner at a public hearing included the following:

“The EIS states that the DOE intends to make the decision on which mode, whether it will be truck, rail, or heavy haul, and the route based on this information. Based on the limited information presented in this document, such a decision could not, would not and could not be an informed one because there is so little information about the routes, the communities they travel through, or even the DOE’s concept of operating this rail line.
“What’s missing in this EIS? Almost everything practical that we need to know about the proposed rail line. Who owns it? Who will operate it? Who will own the track? Who will make the repairs to it?

“Will it be fenced? Who will maintain the fencing? We already know what happens up the country here. It’s not very well maintained.

“How many grade crossings are contemplated? Will there be underpasses, overpasses? How about ranches? We’re going to bisect a tremendous number of allotments. How are they going to cross the railroad?

“And will there be an access road? And again, thanks to Joe, I see it will be and incorporated in the quarter mile right of way.

“Fifty-nine percent of all the assessed parcels in Eureka County are within this ten mile proposed route. The proposed route is within five miles of the second largest population center in Eureka County. It might be just Crescent Valley, but is the second largest population center in Eureka County, and we’re proud of it.

“The EIS makes little mention of the impacts on these people. It does not adequately address the impacts of the building and the operating of a rail line so near private property. And that does not address the possible stigma effects on property values.” (Pete Goicoechea, EIS000630/02)

Another Eureka County official also stated his opinion on the Draft EIS: “The DEIS and its Supplement are inadequate to support a decision on modes, routes or corridors for the transportation of spent nuclear fuel and high-level waste to Yucca Mountain. Disclosure of transportation impacts must not be postponed.” (Leonard Fiorenzi, EIS 010392/11)

Another Eureka resident commented, “I don’t know how many are familiar with what’s called an accident plume, and what it basically is, you start from the beginning when it’s bad, and work out to the point where it is tolerable. And these things are generally with accidents of radiation. I see nothing in there on accident plumes or contaminated areas that were specific to this area with which I’m concerned, due to our prevailing winds and our weather conditions.” (Bill Leppala, EIS000641/03)

DOE Response 8.3 (149): excerpts
DOE believes that the EIS adequately analyzes the 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 (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.

1. 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, DOE selected mostly rail (both nationally and in Nevada), it would then identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In response to public comments, DOE has included, maps of representative highway routes and rail lines it used for analysis in Appendix J of the EIS (see Section J.4). Section J.4 includes health and safety impact estimates associated with shipments for each state through which shipments could pass.

2. If there was a decision to proceed with the development of a repository at Yucca Mountain 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 alternate 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 and tribal designated alternate route) that reduce time in transit. 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.

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 cautions but reasonable assumptions if there are uncertainties offer the most appropriate means to arrive at conservative estimates of transportation-related impacts.

Although the EIS analyses are based on the latest reasonably available information and state-of-the-art analytical tools, not all aspects of incident-free transportation or accident conditions can be known with absolute certainty. In such instances, DOE has relied on conservative assumptions that tend to overestimate impacts. For instance, DOE assumed that the radiation dose external to each vehicle carrying a cask during routine transportation would be the maximum allowed by U.S. Department of Transportation regulations. Similarly, DOE assumed that an individual, the "maximally exposed individual," would be a resident living 30 meters (100 feet) from a point where all truck shipments would pass. Under these circumstances, the maximally exposed individual would receive a dose of about 6 millirem from exposure to all truck shipments (6 millirem represents an increased probability of contracting a fatal cancer of 3 in 1 million). Although it can be argued that individuals could live closer to these shipments, it is highly unlikely that an individual would be exposed to all shipments over the 24-year period of shipments to the repository, even though DOE incorporated this highly conservative assumption in the analysis.
However, in response to comments, DOE has considered locations at which individuals could reside nearer the candidate rail corridors and heavy-haul truck routes in Nevada as a way of representing conditions that could exist anywhere in potentially affected communities. For example, DOE assumed that a maximally exposed individual could reside as close as 4.9 meters (16 feet) to a candidate heavy-haul truck route. During the 24-year period of repository operations this maximally exposed individual would receive an estimated dose of about 29 millirem, resulting in an increased fatal cancer probability of 2 in 100,000.

Further, the EIS contains a discussion of potential impacts from accidents in both the mostly legal-weight truck scenario and the mostly rail scenario (see Section 6.2.4.2). The accident analysis includes a description of the consequences of a release of radioactive material from a transportation cask, although such an event would be extremely unlikely. The EIS states that an accident involving a release from a transportation rail cask could result in approximately five latent cancer fatalities in an urban area. A severe accident in another population zone (for example, rural) would have lower consequences.

3. As stated above, 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. The choice of a rail corridor or intermodal transfer station location and heavy-haul truck route within Nevada would not be based solely on the potential environmental impacts identified in the EIS. DOE would consider factors such as engineering feasibility, safety, input from the State of Nevada and surrounding communities, and cost in its decisionmaking. The extent to which the branch rail line, or parts of the branch rail line, would be fenced would be determined through additional consultations and appropriate National Environmental Policy Act reviews, including determinations on necessary mitigation measures.

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 stakeholders. DOE would retain responsibility for policy decisions, stakeholder relations, final route selection, and implementing Section 180(c) of the NWPA. DOE would award contracts for acceptance of spent nuclear fuel and high-level radioactive waste and transportation services to those 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, truck, or intermodal 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, or cost-effectiveness, or lessen the potential of adverse railroad equipment incidents.

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 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 dealing with 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. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

Response to DOE Response:
DOE has not, in this response, addressed many of the issues raised by Eureka County residents in the above comments. Because this was a response to a summary of 218 comments, the specific issues raised by Eureka County residents, including mitigation concerns such as fences, grade crossings, grazing allotments, underpasses, overpasses, and issues such as the future of private property along the rail corridor and economic stigma effects, were completely overlooked in this response.

Further investigation reveals that in the document as a whole, the impacts on agriculture for the proposed Carlin corridor are not discussed (a vague and generic analysis covering all the proposed rail lines is given on pp. 6-76 to 77); decisions on underpasses and overpasses are not definitively made; and the Final EIS seems to be curiously ambivalent on the issue of fencing, stating,

> Fewer individuals of large species would be likely to be killed during operations if the corridor was fenced, but fencing could restrict animal movement and disrupt migration patterns. Furthermore, fences would require continual surveillance to prevent individual animals or herds from being trapped. Nevertheless, the demographics of small herds could be adversely affected if individuals important to the viability of the herd were struck by a train. (p. 6-82)

When considering economic impacts, DOE lumped Eureka, Lander, and Esmeralda Counties into a group categorized “as part of the Rest of Nevada, the portion of the State outside the region of influence (p. 6-115).” The impacts of the construction and operation of the Carlin Route on the employment, population, and economics of the “Rest of Nevada,” according to the Final EIS, will be either “less than 1 percent of the applicable baselines” or “unlikely (p. 6-115).” This lump categorization is dismissive to Eureka County and fails to address any specific economic or demographic impacts to the County. Each county has its own unique economy; a county-specific assessment of economic impacts must be conducted to better assess the specific impacts on each of these three separate economies.

Regarding the future of private property, the Final EIS states that “[t]he withdrawal from the private sector...would occur under existing government protocols,” acknowledging that “[t]he withdrawal of lands from private ownership could impact area city and county economic expansion through the loss of tax revenues (p. 6-106).” However, DOE also admits that
information on conversion of private land to public use, and subsequent impacts on taxes and the economy is not presently available. The agency states that potential land use impacts would be minimized through “judicious alignment” of the rail line within the corridor (SRCS, p. 3-61).

Eureka County believes more detailed information about land use and the associated economic impacts should be made available before any transportation decisions are made. Merely identifying the fact that tax revenues could be impacted without quantifying or expanding upon the nature of these impacts is inadequate. And it must also be noted that while “judicious alignment” of the rail line could minimize some impacts, it would not prevent the taking of large areas of private land.

Additionally, DOE admits that the presence of a rail line “could influence future development and land use” in Crescent Valley, but fails to mention any impacts to Beowawe (p. 6-107). The community of Beowawe would also be affected by the proposed rail line. More detailed information about such impacts should be made available before any further transportation decisions are made.

While DOE has expanded the amount of information and analyses on which it has based certain broad transportation decisions in the Final EIS, the information included is still insufficient to make specific transportation decisions. In addition to more detailed environmental and demographic analyses, definitive mitigation measures must also be presented before the true impacts of a rail line can be known and a decision about modes and routes of transportation can be made.

Comment:
“And I have a few short questions as well. What exactly is an adequate buffer corridor during construction of rail line in terms of health and safety of residents immediately adjacent? What is an adequate buffer corridor after completion of construction? Where exactly will wells be drilled along the Carlin route? Where exactly will man camps be located of the construction crews? Which of the five proposed rail routes is the most cost effective? What are the projected costs for each of these five proposed rail routes through Nevada? Which of the five proposed rail routes is the most cost effective? What are the projected costs for each of these five proposed rail routes through Nevada? Will there be an overpass or an underpass for county access roads to private property? Who will maintain these changes that would be made to county access roads?” (Jamie Gruening, EIS000632/04)

DOE Response 8.6.2 (186):
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 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. 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 geotechnical 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.

The life-cycle cost estimates for each rail corridor alternative in Nevada are presented in the EIS Summary, Section 6.3.2.1. The conceptual designs and cost estimates for all five rail corridor alternatives were developed at similar levels of detail and have similar uncertainties, so valid comparisons can be made. DOE anticipates that the cost estimates would change, albeit not substantially, as a result of detailed engineering and design studies.

**Response to DOE Response:**
This response being again a summary of multiple comments, the above questions raised by the Eureka County resident were not specifically addressed.

The issues that are outlined in the above comment are indicative of a larger question that many of Eureka’s citizens have asked again and again over the course of the EIS process: how can DOE make decisions on both alternative transportation modes and specific transportation rail corridors with so little specific information?

Many of the questions raised by this commenter, as well as others, remain without adequate answers. The location of construction camps is not disclosed in the Final EIS (DOE only states that it intends to establish five camps at roughly equal distances along the corridor, p. 6-105). While the Final EIS estimates the amount of water that will be used in the construction of a rail line (660 acre-feet or 810,000 cubic meters that would come from 67 wells, p. 6-108), it does not give the proposed locations of the wells. The life-cycle cost to construct and operate the Carlin route is estimated to be “about $821 million in 2001 dollars (p. 6-105).” With the exception of the Caliente Corridor, the Carlin Route would be the most expensive rail option to construct. However, DOE states in the above response that without more detailed studies, costs cannot be accurately estimated.

Eureka citizens have argued that by the same logic, the impacts and effects of the proposed rail line cannot be accurately estimated either. Without more detailed studies, both the costs and the consequences of this project will remain purely speculative.
Comment:
“The need to pit rural people and urban people against each other, and to say we have to avoid Las Vegas, so the rurals need to take the impact. I think that it’s an unfair, inequitable, and an unsafe proposition to do the roll of the dice. The risk analysis says that the rurals have to take the risk because it’s too unsafe for urban areas. We’re all citizens here. We’re all in the same boat. The EIS, with its bounding analysis, says let’s look at what we can do to the urban area, and that’s the worst thing we could do. The rurals are the backup position.” (Abby Johnson, EIS000648/02)

DOE Response 8.3 (12671):
As described in the EIS, risks to people living in rural or urban areas as a result of a transportation campaign would be primarily associated with transportation accidents. The EIS contains a discussion of potential impacts from accidents in both the mostly legal-weight truck scenario and the mostly rail scenario (see Section 6.2.4.2). For mostly legal-weight truck transportation, Section 6.2.4.2.1 describes the maximum reasonably foreseeable accident, which could cause 0.55 latent cancer fatalities in an urban area. Severe accidents in less urban areas would have smaller consequences. 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.

Response to DOE Response:
While the probability of a transportation accident resulting in a release of radioactive material has been demonstrated in the Final EIS to be slim, the fact remains that such an accident is more likely to take place in a rural area than in an urban one. The Final EIS states that the “maximum reasonably foreseeable accident” that could result in a release of radioactivity has a greater probability of occurring in a rural area than in an urban area (p. J-61, Table J-22). The cost of cleanup for such an accident could range anywhere from $300,000 to $10 billion (p. J-73).

The commenter refers indirectly to this possibility, pointing out that the risk for the greatest consequences of the Yucca Mountain project rests on the shoulders of people living in rural areas such as Eureka County. The Proposed Action evidently carries potential consequences too great to risk the exposure of the urban areas.

Comment:
One commenter recalled a previous testimony she gave on the nuclear waste issue in the mid 80’s, stating that “…the thing I remember from my testimony was saying that a chain is only as strong as its weakest link. At the time I was saying that transportation was the weakest leak. I don’t think that’s really changed. Here we are in 1999, and we don’t know that much more
Another commenter stated, “It is oppressive for anyone who lives near transportation routes or Yucca Mt. They are committed by the nuclear power corporations to live in fear forever. I call it the silent Hitler of America…The building of a train track to carry high level nuclear waste through our valley is a violation of our human rights. There is no question about the inequality here. No one in this valley wants it so rightfully, it shouldn’t be put here or anywhere because no one wants the deadly waste on this planet anywhere. It’s the greediest thing yet for big corporations to profit off of something that goes against people’s health and happiness.” (Nancy Louden, EIS001941/07, 08)

Yet another Eureka resident commented on the same subject, “The transportation of nuclear waste by rail in no way can be considered safe unless it is a hundred percent sure [there] will never be an accident. That is impossible. Train accidents happen all the time. The deadly cargo will endanger many lives. You can’t take chances, it’s just not safe.” (Nina Louden, EIS001942/07)

DOE Response 8.1 (170): excerpts
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 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 of the United States, 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.

There are no Federal regulations pertaining to rail routes for shipment of spent nuclear fuel or high-level radioactive waste. The shipper and railroad companies (carriers) determine rail routes based on best available trackage, schedule efficiency, and cost-effectiveness. This includes selecting routes that result in minimum time in transit, minimum interchanges, and maximum use of mainline tracks. The routes must be submitted in advance to the Nuclear Regulatory

about transportation than we did in 1986 or ’85. I think that’s a real problem.” (Abby Johnson, EIS000648/01)
Commission for approval. In addition, DOE has developed operational protocols (see Section M.3 of the EIS) that include guidelines for selecting rail routes. DOE applied the guidelines in identifying routes for analysis in the EIS.

Section 6.2.4 of the EIS provides results of analyses from postulated transportation accidents and Section J.1.4 provides details of the methods and data used in the analyses. The analysis of impacts to populations along shipment routes assumed that an accident could occur at any location along the route. Given the number of shipments, traffic accidents probably would occur, although 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.

"Real-life" transportation accidents involve a myriad of collisions, such as with other vehicles and obstacles, that could result in fires and explosions, inundation or burial of a cask containing spent nuclear fuel and high-level radioactive waste. These accidents would be initiated by a variety of events including human error, mechanical failure, or natural causes, such as earthquakes or landslides. Accidents could occur in different places such as mountain passes, urban areas, on Interstate Highways in rural areas, or rail switchyards.

The combinations of accident conditions, initiating events, and locations is very large. Analyzing an extensive array of accident scenarios is neither practical nor meaningful. However, it is meaningful to analyze a range of reasonably foreseeable accident scenarios that consider, in effect, common initiating events and conditions having similar characteristics. Thus, for example, the EIS analyzes the impacts of various collision accidents in which a cask would be exposed to a range of impact velocities (see Section J.1.4.2.1).

The EIS also analyzes a maximum reasonably foreseeable accident, an accident with a probability of occurrence of about 3 in 10 million per year. To put this in perspective, this accident would occur once in the course of about 5 billion legal-weight truck shipments. In this scenario, a truck cask, not involved in a collision, would be engulfed in a fire with temperatures between 750°C and 1,000°C (1,400°F to 1,800°F) (see Section 6.2.4.2 of the EIS). The conditions of the maximum reasonably foreseeable accident analyzed in the EIS envelop conditions reported for the Baltimore Tunnel fire (a train derailment and fire that occurred in July 2001 in a tunnel in Baltimore, Maryland). Temperatures in that fire were reported to be as high as 820°C (1,500°F), and the fire was reported to have burned for up to 5 days.

DOE could decide to use a dedicated train that carried only the material to be shipped to Yucca Mountain, or could elect to move the spent nuclear fuel and high-level radioactive waste by 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 nonplacarded car, and it may not be placed next to other placarded railcars of other hazard classes.

Since the publication of the Draft EIS, the Nuclear Regulatory Commission published *Reexamination of Spent Fuel Shipment Risk Estimates* ([DIRS 152476-Sprung et al. 2000, all]).
DOE has concluded that the models used for analysis in the Draft EIS relied on assumptions about spent nuclear fuel and cask response to accident conditions that caused an overestimation of the resulting impacts. 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 reports the potential consequences for accidents that could release radioactive materials.

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 shipments. As dictated by results of this reexamination, DOE would modify its methods and systems as appropriate.

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 (63 FR 23753; April 30, 1998) for implementation of Section 180(c) of the NWPA 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.

The Price-Anderson Act establishes a system of financial protection (compensation for personal injury and property damage, including loss of use of property) for the public in a nuclear accident, regardless of who causes the damage. The Price-Anderson Act would indemnify any person held liable for damage, including cleanup of released radioactive materials. Persons indemnified would include DOE contractors, subcontractors, suppliers, state, local or tribal governments, emergency response workers, health care workers, other workers, victims, and other citizens who might be held liable. See Section M.8 of the EIS for a discussion of the Price-Anderson Act.

Response to DOE Response:
DOE has added more detailed information on transportation in this Final EIS. However, without full-scale cask testing and other studies to better determine the risks involved in transporting 70,000 metric tons of radioactive material to Yucca Mountain, the possible consequences of this transportation campaign still remain uncertain.

Additionally, while DOE has expanded its discussion of accident scenarios and made conservative estimates of the possibility that such an accident could occur, as one of the above Eureka County residents mentioned, the fact remains that transportation is not 100 percent safe. Accidents will occur: the Final EIS states that the total estimated number of accidents under the Proposed Action would be at least 10, or about 0.4 per year (p. 6-49). An accident resulting in a release of radioactivity, while assigned a smaller probability, is still within the realm of DOE’s foreseeable accident scenarios. Additionally, such an accident has a higher probability of occurring in a rural area such as Eureka County than in an urban one (p. J-61, Table J-22). The inequality of nuclear waste transportation with regards to the rural population, as referred to in one of the above comments, is given as fact in the Final EIS.

Despite computer modeling and probability studies, DOE cannot assure the 16,400,000 people living within 800 meters of the proposed rail transportation routes that there will never be an accident-caused release of radioactivity with catastrophic consequences (p. J-37, Table J-16).

Comment:
“It seems like on the railway tracks, this nuclear waste is going to be let out to the lowest bidder. I can only assume that, but it’s going to a private contractor that will be taking it down the track…I’m very concerned about the lowest bidder hauling our nuclear waste.” (Patti Leppala, EIS000635/01)
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 EIS).

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(c) 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, truck, or intermodal 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).

Response to DOE Response:
While DOE has added more information about the process of nuclear waste transportation in the Final EIS, many questions remain. For example, what are the “several factors not known at this time” relating to oversight of a rail line? When will such issues be resolved and finally disclosed to the public? Eureka County believes that no decisions on transportation modes and routes can be made before such information is made available for public review.

Shipments of nuclear waste may be conducted “under the umbrella” of Federal and other regulations; however, this in no way ensures “that all shipments would be made safely.” Regulations alone cannot guard against the uncertainties and dangers inherent in the transportation of such vast amounts of hazardous waste; neither can they completely ensure that every commercial shipper will abide by the safest determined procedures in each and every case. Private contractors will be aware of the Price-Anderson Act, which indemnifies them for any liability in the event that an accident involving one of their shipments results in a high-consequence release of radioactivity. According to the Final EIS, Price Anderson “…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…In a general sense, the Federal Government acts as an insurer for these contractors against any findings of liability arising from the nuclear activities of the contractor within the scope of the contract (p. CR7-616).” The fact that private contractors will not be held financially responsible for the consequences of their actions does not inspire public confidence in this shipping campaign.

DOE admits in the above response that “cost-effectiveness” will be a qualification in the decision to contract with any bidder from the private industry for the transportation of nuclear waste. And even though DOE states that cost will not be the sole qualification, the Eureka County commenter quoted above will most likely have little confidence in the potential safety of nuclear waste shipments when the issue of money is such a fundamental part of the equation.

Comment:
“I was just concerned about the range fires because they are really bad here sometimes. And I think maybe that might be a danger if there was a train out there and it couldn’t get through, it would have to stop, or lightning strikes and all of a sudden there is a fire. If there is wind, like we have really bad winds, I don’t know if that’s going to be a danger or not. But that might be something that you should think about.” (Nancy Louden, EIS000646)

DOE Response 8.7 (28):
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 provides a discussion of the protocols and procedures that would be implemented by a Regional Servicing Contractor and its subcontractors under adverse weather or road conditions. The procedures are in two parts.

One part of the procedure relates to preshipment planning, which would use available data related to expected conditions. Shipments would not be dispatched on a route where expected conditions would not comply with the requirements in the procedures. Weather forecasts would be obtained by the Regional Servicing Contractor as part of the preshipment planning, and forecasts for rain, snow, fog, high winds, and tornado warnings would be considered in the determination of the shipment schedule. In general, Regional Servicing Contractors would be responsible for the planning, implementation, and control of the shipments, including responding to changing conditions, as necessary. A contractor would acquire information of road or highway construction that could temporarily affect the planned route. Through consultations with the affected states along the planned route, the contractor would obtain road and highway conditions and information on anticipated construction, along with planning information on long-range highway construction.

The other part of the procedure relates to problems along the route and is for those persons actually involved in making the shipment who would be best able to discuss and report expected and encountered conditions. DOE Protocols, which would be implemented by the Regional Servicing Contractors, require that shipments would not travel when severe weather conditions along routes or adverse road conditions would make travel too hazardous to proceed. Driver and
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crew communications with the control center would provide advanced warning of potential adverse conditions along the route. If unanticipated severe weather or adverse road conditions were encountered, the driver and crew would contact the control center to coordinate routing to a safe parking or stopping area if it became necessary to delay the shipment until conditions improved. Section M.3.2.1.3 of the EIS provides detailed information on the selection of safe parking areas to be used in the event a shipment had to be delayed.

Rail carriers would use train control and monitoring systems to identify the location of their trains within the rail system and to make informed decisions based on this information to avoid or minimize potential weather-related or track condition risks. Under 49 CFR 174.20, the carrier can impose local restriction on transportation when local conditions make travel hazardous.

The transportation regulations of the Nuclear Regulatory Commission include shipping cask design requirements for normal and accident conditions of transport (10 CFR Part 71). The regulations do not specifically address natural disasters such as earthquakes, floods, or tornadoes. However, if a shipment to Yucca Mountain was involved in any of these natural disasters, the impact on the cask would be within the bounds of the hypothetical accident defined in 10 CFR Part 71. 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. Numerous tests and extensive analyses have demonstrated that casks would provide containment and shielding even under the most severe kinds of accidents. In addition, since the publication of the Draft EIS, the Nuclear Regulatory Commission published Reexamination of Spent Fuel Shipment Risk Estimates (DIRS 152476-Sprung 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.

Response to DOE Response:
Since this response addressed a summary of many comments, DOE did not specifically address the issue of range fires. DOE stated that weather conditions – specifically forecasts for rain, snow, fog, high winds, and tornado warnings – would be considered before any nuclear waste shipments are dispatched. However, as the above commenter stated, range fires are usually sudden and highly unpredictable, making it difficult to take them into consideration when deciding whether or not to dispatch a shipment from many miles away.

DOE’s response also states that the casks, regulated to specifications set forth by the Nuclear Regulatory Commission, would not be specifically designed to withstand natural disasters such as earthquakes, floods, or tornadoes. It can only be assumed that range fires would also fall into the “natural disaster” category and will not be a specifically considered possibility during cask development. While computer simulated tests may be planned to ascertain the general effects of
fire on a cask, full-scale testing – which is currently planned for only one rail cask in a single scenario – must take place before the consequences of an engulfing fire on a cask can be reasonably understood.

The above commenter takes the possibility of range fires to be a serious issue; DOE should therefore address the commenter’s concerns instead of giving vague generalities.

Comment:
“Beowawe and Crescent Valley, Nevada, might be considered townships with small populations, even if all the surrounding areas were included. Our land, though, has much natural beauty, good fishing, hunting, colorful spring flowers, canyons in the mountains, willows and cottonwood trees and streams winding through. Our children have a great school and a small community to grow up in. The Yucca Mountain Project will destroy all of this…as radioactivity flows into the air and seeps into the water supply for both the flora and fauna.” (Nancy Louden for Jean Plummer, EIS000972/01)

Another commenter concurred, “This is a beautiful valley, and we all love it and live in it, and this railroad will destroy it, in my view.” (Lance Paul, EIS000633/02)

DOE Response 8.11.9 (47):
The Carlin Corridor, part of which passes through Crescent Valley, is but one of five alternative rail corridors DOE considered in Section 6.3 of the EIS. Similarly, the Carlin heavy-haul truck route is only one of five alternative heavy-haul truck routes under consideration (see Section 6.3). See Sections 6.3.2.1 and 6.3.3.1 for discussions of the impacts from noise and to aesthetics in rail and heavy-haul truck corridors, respectively.

Crescent Valley has already been altered by man. There are houses, ranches, roads, and businesses in the valley, most of which are along State Route 306 between the Cortez area and Beowawe. There are historic and present-day mining operations in the vicinity of Cortez, and the effects of these operations are evident in the valley. Tailing piles, access roads, and mining facilities are evident. South of the Cortez area, there are fewer disturbances to the valley, consisting primarily of farming operations.

DOE recognizes that additional, site-specific information would be needed before it constructed either a branch rail line or upgraded roads to support heavy-haul truck shipping. DOE believes, however, that sufficient information on impacts to visual resources is provided in Chapter 6 of the EIS to help make a decision about the transportation mode (rail or truck) and the specific corridor or heavy-haul truck route (see Section 1.1 of the EIS). More detailed field surveys, government consultations, and appropriate National Environmental Policy Act reviews would be conducted if DOE made a decision to select either a specific rail alignment within a corridor or an intermodal transfer station and associated heavy-haul truck route. These additional reviews could include more detailed analyses of impacts to visual resources, as well as the identification of possible mitigation measures to minimize any impacts identified.
Sections 6.2.3 and 6.2.4 of the EIS summarize the radiological impacts of transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Appendix J describes these impacts in more detail. The radiation dose from routine transportation would not be likely to harm plant or animal life within the area. Sections 4.1.4 and 5.9 discuss radiation impacts to biological resources.

Response to DOE Response:
The above Crescent Valley residents are opposed to the proposed Carlin Corridor, which would cut through the valley and bring thousands of shipments of nuclear waste past their homes. However, DOE has curiously focused much of its response to these comments on the issue of aesthetics, pointing out that activities such as mining and ranching have caused greater visible disturbances than a rail line would. It is obvious, though, that these commenters are concerned not about the appearance of tracks running through the valley and the sight of moving trains, but the unseen, and potentially catastrophic risk such shipments would bring into their communities.

DOE does mention the effects of the radiation exposure the trains will bring, stating ambiguously that any harm caused by such radiation doses would “not be likely.” The possibility of an accident involving nuclear waste is not, however, specifically discussed in this response, despite the fact that it is most likely the concern to which the commenters are alluding. The possibility of such an accident occurring is well within the realm of DOE’s reasonably foreseeable scenarios (p. J-50) and is postulated to be most likely to occur in a rural area (p. J-61, Table J-22).

Further, DOE states in the above response that “[m]ore detailed field surveys, government consultations, and appropriate National Environmental Policy Act reviews would be conducted if DOE made a decision to select either a specific rail alignment within a corridor or an intermodal transfer station and associated heavy-haul truck route.” As has been previously stated by commenters and Eureka County officials, DOE should conduct such studies and consultations and analyses prior to the designation of any rail route in order to accurately identify any potential impacts to health and human safety and the surrounding environment. Specific measures to mitigate such impacts must also be identified prior to any rail corridor decision.

Comment:
“This plan has already been implemented so your next step is to discuss the safest way to transport this nuclear waste through your "valley." This should be your primary reason for meeting and discussion. Being realistic about this is the only way to be, all the yes’s and no’s mean nothing they are only words it is action to assure the safety of this transportation that counts.” (Margaret E. Meharg, EIS001265/01)

DOE Response 8.1 (6092):
DOE has made no decision regarding the proposed monitored geologic repository at Yucca Mountain. After the EIS has been completed, the Secretary of Energy will decide whether to recommend approval of the development of a monitored geologic repository at Yucca Mountain to the President.
The Secretary of Energy will consider the potential impacts associated with transportation of high-level radioactive waste and spent nuclear fuel when determining whether to recommend Yucca Mountain as the site of the monitored geologic repository. Although no transportation decisions would be made until after completion of the Site Recommendation process, DOE believes that the EIS provides the information necessary to make decisions regarding the basic approaches (for example, mostly rail or mostly truck shipments), as well as the choice among alternative rail corridors in Nevada.

With respect to transportation safety, DOE agrees that the ability to safely transport high-level radioactive waste and spent nuclear fuel to the proposed repository is an integral part of the determination on whether to recommend Yucca Mountain as a site for a repository. The protocols to be used by the Regional Servicing Contractors are listed in Section M.3 of the EIS. These protocols meet the statement made by DOE in Section 2.1.3.2 that the transportation of spent nuclear fuel and high-level radioactive waste would comply with all applicable regulations of the U.S. Department of Transportation and the Nuclear Regulatory Commission.

Response to DOE Response:
While DOE had, as of the release of the Final EIS, made no decision to officially recommend the Yucca Mountain Project, it did identify the “Proposed Action” as its preferred alternative relating to the results of the site characterization studies to date (p. S-2).

DOE acknowledges the importance of transportation safety in this response; however, DOE has not acted adequately upon such a statement. This commenter, as well as many others in Eureka County, believe that more studies and more information are needed before the true impacts and the level of safety can be accurately determined. Until these analyses have taken place, DOE does not have enough information to make justifiable decisions regarding the rail corridors.

Comment:
“Now in reading between the lines of the information on the Internet it would seem to me that this EVENT is going to take place sooner or later. Yucca Mountain seems to be already prepared for this to happen.

“The only comment I have to make is if this indeed must happen, why not build a Mono-Rail type structure then there would be no Crossings, no Blockages, also the Habitat of the animals would not be disturbed.” (Margaret E. Meharg, EIS002068/01)

DOE Response 8.3.3 (23): excerpts
DOE did not consider alternatives such as those discussed in the comments, including special rail lines to circumvent cities, a new national rail line dedicated for shipment of spent nuclear fuel and high-level radioactive waste, or a monorail, because the potential impacts identified from rail and truck transportation using existing infrastructure would be small, cost of the suggested alternatives would be high, and new construction for these alternatives would increase impacts.
Response to DOE Response:
If DOE did not even consider such alternatives as the one suggested by the commenter above, how can it definitively state that impacts and costs would be increased by such alternatives? Additionally, DOE’s contention that the impacts from constructing and operating a new rail line for nuclear waste shipment would be “small” is unfounded and dismissive of the effects a rail line would have on the communities and environment of Eureka County.

Comment:
“Is the proposed rail line to be a single use line or will it have other potential uses? Will rail roads handle these shipments as dedicated cargo or will they be shuffled from rail line to rail line and possibly lost? Will there be buffer zones along the tracks?” (Laura Mae Scott, EIS001232/08)

DOE Response 8.6.1 (4464):
Decisions on whether or not to build a branch rail line, management of such a line, and other potential uses would be addressed after a decision on the suitability of the repository site. As discussed in Section 2.1.3 of the EIS, the conceptual design used in preparing the EIS assumed a single set of tracks and rail sidings. Sidings would be an average of 20 miles apart and approximately 0.5 kilometer (0.3 mile) long (see DIRS 154822-CRWMS M&O 1998). Should the mostly rail alternative be selected, additional, more detailed studies and designs would be conducted for the particular corridor and alignment identified. The need for additional sets of tracks and rail sidings would be evaluated during this design stage. Additional National Environmental Policy Act reviews, as required, would be conducted at that time.

A qualitative comparison of attributes of general rail-freight to dedicated train service in Table J-25 and in Section J.2.3 of the EIS, which is based in part on results of a recent U.S. Department of Transportation study, does not indicate a clear advantage for the use of either type of rail service. Thus, impacts discussed in the EIS are estimated based on typical railroad operations. In these operations, railroads transport freight cars, including cars carrying hazardous materials, along with other freight in trains that average 67 cars in length. DOE believes the analysis presented in the EIS supports use of either general-rail freight or dedicated-train service. DOE’s Draft Request for Proposals for Regional Servicing Contractors (see Appendix M of the EIS), states that contractors could be directed to use dedicated train service where it can be demonstrated to enhance operations efficiency and cost-effectiveness.

The branch rail line would be built following applicable Federal Railroad Administration, American Association of Railroads, and State of Nevada requirements.

Response to DOE Response:
The response to the above comment gives no definitive answers to any of the questions posed by the commenter. The issue of dedicated train to general rail-freight remains ambiguous, with both modes having benefits and no decision made between the two – excepting where cost plays a factor. The question of whether or not there will be a buffer zone has not been answered. DOE has also indicated that the decision on whether the rail line will be for a single or multiple uses.
has not and will not be made prior to a site recommendation, which is unsatisfactory to the many Eureka County commenters who have asked this question again and again over the EIS process. Questions such as these should have been resolved before the recommendation of the Yucca Mountain Site and must be answered before a decision on a rail corridor is made.

Comment:
“Will there be nuclear waste hauled on I-80? Will we be notified about these shipments?” (Laura Mae Scott, EIS001242/07)

DOE Response 8.3 (161): excerpts
DOE has not attempted to conceal transportation routes. 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 could begin, it is impossible to predict with a reasonable degree of accuracy which highway or rail lines would be used. For example, in the interim, state or Native American tribal governments could designate alternate preferred highway routes and new highways and rail lines could be constructed or modified. Therefore, for purposes of analysis in the 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, as 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 that were used for the EIS analysis (see Figures 6-11 and 6-12).

In response to public comments, DOE has added Appendix M to the EIS to provide further information on topics concerning transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. These topics include liability for transportation accidents, emergency management, cask safety and testing, and transportation services acquisition and protocols.

As discussed in Sections J.1.2.2 and M.2.6 of the EIS, specific routes would be identified well before shipments in accordance with transportation protocols that would apply in the event of emergencies or other conditions that required deviation from the regular routes. As stated in the EIS (see Section 2.1.3.2.2) and noted above, a truck carrying a shipping cask of spent nuclear fuel or high-level radioactive waste would travel routes to the repository in accordance with U.S. Department of Transportation regulations (49 CFR 397.101), which require the use of preferred routes. These routes include the Interstate Highway System, including beltways and bypasses. Alternate routes may be designated by states and tribes following U.S. Department of Transportation regulations (49 CFR 397.103) that require consideration of the overall risk to the public and prior consultation with affected local jurisdictions and with any other affected states and tribes. The highway routes would be selected in accordance with these Federal transportation regulations and would be approved by DOE. As noted above, there are no Federal regulations pertaining to rail routes for shipment of spent nuclear fuel or high-level radioactive waste. The
shipper and railroad companies (carriers) determine rail routes based on best available trackage, schedule efficiency, and cost-effectiveness. This includes selecting routes that result in minimum time in transit, minimum interchanges, and maximum use of mainline tracks. The routes would be submitted in advance to the Nuclear Regulatory Commission for approval. In addition, DOE has developed operational protocols (see Section M.3.2.1.2 of the EIS), that include guidelines for selecting rail routes. DOE applied the guidelines in selecting routes for analysis in the EIS. If the U.S. Department of Transportation promulgates rail routing regulations, DOE would change its operational protocols, as appropriate, to comply with the regulations.

Local health and safety impacts of transporting spent nuclear fuel and high-level radioactive waste would be a fraction of national impacts discussed in Section 6.2.3 of the EIS. The population impacts in small communities would be much less than the population impacts in metropolitan areas, though the impacts to maximally exposed individuals would be comparable. Section 6.2 of the EIS discusses socioeconomic and other potential impacts of national transportation of spent nuclear fuel and high-level radioactive waste. Because existing rail and highway systems would be adequate for transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain, except under conditions where heavy-haul trucks would be used, infrastructure upgrades would not be necessary and therefore are not included in the analysis. The EIS assumes that sites identified as being served by a railroad would use rail and that sites that do not have rail service (for example, needing rail spur upgrades) would ship using heavy-haul trucks or barges to nearest railheads.

Response to DOE Response:
DOE’s response, which addressed a total of 130 comments, did not respond specifically to the above comment from a Eureka County resident.

The maps referenced in the response indicate that no truck shipments will take place on Interstate 80 in Nevada (p. 6-34). The routes on these maps are, however, only “representative” and do not reflect the reality of truck shipments. The actual transportation routes are not to be specifically identified, according to DOE, for a number of years.

The above response states that shipping routes would be identified at least 4 years prior to the beginning of nuclear waste shipments. These routes, according to the above statement, would be determined by the commercial shippers and would be submitted to the Nuclear Regulatory Commission for approval. However, information in the Final EIS appears to contradict this timeframe, stating that “…the actual shipment route selections would be submitted to the Nuclear Regulatory Commission for approval 1 or more years before shipments began (p. M-6).” One year is insufficient advance notice given the importance of the shipments. This discrepancy must be clarified before any further transportation decisions are made.

Additionally, DOE concludes that, with the exception of heavy-haul truck transport, “existing rail and highway systems would be adequate for transporting spent nuclear fuel and high-level radioactive waste.” However, DOE does not cite the source of this information, nor elaborate on what basis such a determination was made.
Comment:
“My advice to all the communities involved which looks like the entire USA would be to look for solutions to make the transport of this material safer...It would appear due to a paragraph on page 3 of the Executive Summary [of the Draft EIS] stating as of Dec 1999 (not too long ago) that our scientists are working on a solution to make transportation safer...I am aware that there are two situations involved in this procedure i.e. the already stored material which could be leaking and the waste produced daily by our Reactors all over the States...Safety of this transportation of all this material is of the utmost importance to humanity...My opinion of the fact that this proposal for Yucca Mountain seems to be a DONE DEAL already, would be to concentrate on complete safety on all measure taken by the DOE etc.” (Margaret E. Meharg, 010061/01)

Another commenter asked, “If transported by rail or highway, what provision is made for safety during transport? How do you prevent highway or rail accidents?” (Donna M. Woods, EIS001945/05)

DOE Response 8.7 (184):
In response to these and other public comments, DOE has added information on proposed transportation activities to the EIS. Appendix M includes additional information on 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 (see Sections M.2 and M.3).

DOE is required to follow Nuclear Regulatory Commission, U.S. Department of Transportation, and applicable state, Native American tribal, and local regulations and use Commission Certified casks when transporting spent nuclear fuel and high-level radioactive waste to a repository. DOE is confident that by implementing these regulations and using Commission Certified casks, this transportation can be carried out in a safe manner. Of the thousands of shipments completed over the last 30 years, none has resulted in an injury through release of radioactive material.

U.S. Department of Transportation regulations require carriers of spent nuclear fuel and other materials with a high level of radioactivity to use preferred routes that reduce time in transit. A preferred route for highway shipments is an Interstate System highway or alternate route selected by a state or tribe. Rail routes for shipping radioactive materials are determined by the shipper and the railroad companies based on safety, available trackage, schedule efficiency, and cost-effectiveness. See Section M.3.3.1.2 of the EIS for additional information on route selection.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors that would perform waste acceptance and transportation operations. 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 were conducted in a safe and efficient manner. Among other things, the plan would provide for the use of dedicated train service where this type of service could 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).

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 nonplacarded car, and it cannot 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 DOE’s opinion that there is no clear advantage for using either dedicated trains or general freight service.

Drivers would be required to meet the qualifications specified in U.S. Department of Transportation regulations (49 CFR Part 391). They would also be required to complete the training called for in 49 CFR 177.816 (see Section M.3.2.1.7 of the EIS).

The radiation levels on the surface of casks carrying spent nuclear fuel and high-level radioactive waste to a repository would be measured prior to the shipment to ensure levels were within regulatory limits. Additional measurements could be made en route any time the shipment underwent an inspection.

As with any traffic accident, local, tribal, and state public safety officials would be the first to respond to accidents involving radioactive materials. Additional assistance could be requested from Federal agencies. Damages from the accident caused by the release of radioactive materials would be handled under the provisions of the Price-Anderson Act. Any damages caused by a non-nuclear accident (an accident not involving the release of radioactive materials or authorized precautionary evacuation) would be covered by the carrier’s private insurance and handled through state tort law as with any other transportation accident.

Response to DOE Response:
It must be reiterated that just because shipments of nuclear waste would be conducted according to rules set forth in Federal and other regulations, this in no way ensures complete safety of all shipments or eliminates all errors that could result in an accident. Regulations alone cannot guard against the uncertainties and dangers inherent in the transportation of such vast amounts of hazardous waste; neither can they completely ensure that any commercial shipper will abide by the safest determined procedures in each and every case. As DOE pointed out above, private contractors will be aware of the Price-Anderson Act, which indemnifies them for any liability in the event that an accident with one of their shipments results in a high-consequence release of radioactivity.

Additionally, DOE admits in the above response that “cost-effectiveness” will be a qualification in the decision to contract with any bidder from the private industry for the transportation of
nuclear waste. And even though DOE states that cost will not be the sole qualification, the fact that money is such a fundamental part of the equation does not inspire public confidence.

DOE has stated numerous times that of the “…thousands of shipments completed over the last 30 years, none has resulted in an injury through release of radioactive material.” However, DOE cannot rely on past information to predict future events, especially given the fact that a nuclear shipping campaign of this magnitude has never before been undertaken. Accidents will occur (according to the Final EIS, at least 10 over the course of all shipments, p. 6-49) and the potential for an accident in which radioactivity is released is very real indeed (p. J-50).

Comment:
“The EIS does not analyze the impacts of nuclear waste transportation over decades on the existing rail and highway infrastructure within Nevada, and we all know what I-80 looks like and the construction we go through there.” (Pete Goicoechea, EIS000630/11)

DOE Response 8.9 (193): excerpts
For purposes of analysis in the EIS, DOE assumed infrastructure and practices, including maintenance and enforcement of safety standards, used in transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain by rail would be comparable to that in current service (49 CFR Part 213). In this regard, the analysis of transportation accidents included the potential for accidents involving trains passing near each other on adjacent rails, while traveling in opposing directions at high speeds. DOE believes it is reasonable to expect the safety of infrastructure and practices for shipments to Yucca Mountain for the Proposed Action would be at least equivalent to that today.

National impacts estimated in the EIS use data that incorporate statistics compiled from accidents in localities across the United States. The statistics include those for accidents where transportation infrastructure was a contributing factor. Thus, potential impacts in any locality, even one having transportation infrastructure with unusual hazards, would be much less than for the entire transportation system. As a consequence, with the exception of the heavy-haul truck scenario, DOE believes existing highway and rail infrastructure, as well as its maintenance and public safety services, would be adequate for the safe transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. DOE also believes the potential impacts to infrastructure and public safety services from transportation would be minimal. Because the estimates are based on present-day transportation conditions, DOE believes it would not be necessary to upgrade infrastructure to support shipments to Yucca Mountain. As discussed in Section 6.3.3 of the EIS, heavy-haul truck transport in Nevada could affect transportation on designated roads in the State. As discussed in that section, Nevada highways along a route, including roads, bridges and culverts, would be upgraded for heavy-haul truck use, if DOE selected heavy-haul truck transport. Upgrades would include reconstruction of some highway sections, especially in areas where spring and fall thaws and freezes make highways susceptible to damage by heavy vehicles. In addition, new turnout lanes at frequent intervals along two-lane highways would be constructed to allow other traffic to pass the slower heavy-haul vehicles. The location and frequency of turnouts would be determined in consultation with State and Native
American tribal jurisdictions after a specific route were selected. Highway shoulders would be widened and road surfaces would be improved in many areas. The potential impacts of these construction activities are analyzed in the EIS. Section 6.3.3.1 discusses impacts heavy-haul trucks would have on the flow of traffic on roads in Nevada. This section observes that heavy-haul trucks would interfere with the free flow of traffic, leading to queues behind trucks in some areas. It also discusses the level of service for Nevada highways, noting that for many of Nevada’s rural highways the level of service is A, which represents free-flowing traffic with few vehicles. In addition, in analyzing candidate routes for heavy-haul trucks, DOE projected traffic volumes for the routes (DIRS 154675-Ahmer 1998). DOE assumed that heavy-haul trucks would operate under permits issued by the State of Nevada and also assumed, for purposes of analysis in the EIS, that these permits would specify conditions of travel.

Cost estimates developed for highway upgrades associated with the heavy-haul truck transport implementing alternatives include cost for design and construction of road upgrades for public roads and for annual maintenance of the roads that would be used (DIRS 154765-Ahmer 1998). The estimated costs discussed in EIS Section 6.3.3 for each candidate route are based on detailed estimates, which include lane widening, truck lane and turnout construction, pavement upgrades, intersection upgrades, pavement type, and shoulder upgrades.

DOE would be responsible for making the funding available for the upgrades if it selected heavy-haul truck transport, and for working with the State of Nevada and Native American tribes to ensure funding was available for the road upgrades necessary to provide infrastructure for transporting spent nuclear fuel and high-level radioactive waste using heavy-haul trucks on Nevada roads. For purposes of analysis in the EIS, DOE assumed funding to upgrade routes in Nevada for heavy-haul truck transport would originate from a source or sources outside the State.

Response to DOE Response:
DOE states above that it believes current transportation infrastructure “would be adequate for the safe transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain.” This is, however, exactly what the commenter is concerned about: that this current level of infrastructure is grossly inadequate to carry the burden of so many shipments of nuclear waste.

DOE does not believe it would be necessary to upgrade infrastructure to support shipments to Yucca Mountain except in the case that heavy-haul trucks are used. Eureka County residents, however, who know the inadequacies of the roads they travel every day, will not be confident in the safety of this shipping campaign unless the roads are properly upgraded to support any truck carrying nuclear waste, not just those designated as heavy-haul.

Before any transportation decisions can be made, DOE should designate shipping routes and analyze in more detail the conditions of the chosen roads. Given the results of such analyses, DOE should then proceed to update the existing infrastructure as necessary.
Comment:
“What effects will earthquakes have on the [railroad] tracks? The trains, the site and the canisters?” (Laura Mae Scott, EIS001242/13)

DOE Response 8.6.3 (3364):
There was an earthquake with a Richter magnitude of 7.4 in El Asnam, Algeria in October 1980. At the time of the main shock a train was straddling the fault. The train was completely overturned. At another site nearby the railroad tracks were bent; it is suspected that this might have been caused by a secondary fault. If a train carrying a shipment of casks containing spent nuclear fuel or high-level radioactive waste was involved in a similar earthquake, the impact on the train would probably be comparable. However, it is not expected that any radioactive material would be released from the transportation casks. They are designed to survive a much more severe shock than that resulting from an overturned or derailed train.

Response to DOE Response:
While it is true that in theory the casks will withstand the shock resulting from an overturned train, the casks themselves have not actually been tested. Full scale cask testing must take place if the full effects of the different accident scenarios are to be known.

b. Health and Human Safety

Comment:
One the subject of human health and safety, one Crescent Valley landowner comented, “From acquired information from the Yucca Mountain Office, I must concur with the local peoples’ concern about the potential effects on the children and on the environment from nuclear waste. Being a parent myself, I have come to realize the vulnerability of children in their younger years and their susceptibility to disease from unhealthy surroundings.” (Kim M. Elegado, EIS000184/01)

DOE Response 7.5.7 (98): excerpts
In addition to fatal cancers, as the commenters have suggested, experts generally recognize that other health effects could result from exposure to radiation. Therefore, to enable comparisons with fatal cancer risk, the International Commission on Radiological Protection (DIRS 101836-ICRP 1991) suggested the use of detriment weighting factors that consider the curability rate of nonfatal cancers and the reduced quality of life associated with nonfatal cancers and heredity effects. However, as discussed in Section F.1.1.5 of the EIS, because both of these life detriment factors, taken together, amount to less than half the fatal cancer risk, DOE has chosen to estimate only latent cancer fatalities as the most important health effect from exposure to ionizing radiation.

For these reasons, DOE used dose-to-risk conversion factors recommended by the National Council on Radiation Protection and Measurements (DIRS 101856-NCRP 1993) and the International Commission on Radiological Protection (DIRS 101836-ICRP 1991) for estimating the risk of latent cancer fatality from exposure to ionizing radiation. These factors were developed based on the linear no-threshold hypothesis, which assumes that adverse health effects could occur from exposure to ionizing radiation regardless of how small the dose.
However, all types of individuals are included in the radiation risk factor of 1 latent cancer fatality per 2,000 rem of ionizing radiation received by an exposed population (0.0005 latent cancer fatality per rem). Children comprise a relatively large part of the population and are more sensitive to the effects of radiation (cancer induction) than adults. Children are the principal reason the risk factor for the whole population is 25 percent higher than the factor for workers (1 latent cancer fatality per 2,500 rem, or 0.0004 latent cancer fatality per rem).

Response to DOE Response:
As this was a summary response to many different comments, the question raised by the above commenter does not appear to have been addressed at all. DOE mentions in the response that “[c]hildren…are more sensitive to the effects of radiation than adults.” However, nowhere does it appear that DOE has undertaken any specific analysis of the effects of radiation exposure just to children or proposed how such effects could be mitigated.

In a note unrelated to the commenter’s unanswered questions, it is unsatisfactory for DOE to not take into account the many cumulative life-altering and detrimental effects of cancer other than fatalities. Eureka County citizens are concerned about how the quality of life for residents of Crescent Valley will change as a result of this decades-long transportation campaign – this includes the possibility of diseases, birth defects, and other radiation exposure induced illnesses that may not necessarily lead to death, but ultimately could destroy lives. DOE must take such impacts into account when assessing the health and human safety consequences of this project.

Comment:
A County Commissioner stated, “We see the need for baseline health data. In November of 1995, Eureka County submitted scoping comments to the Department of Energy suggesting issues that should be covered in the EIS. One of our themes was the need for baseline health data, along with the method of compensation which would insure that the victims are compensated in a timely manner for their exposure. This was not adequately addressed in the EIS, and again, this was a request we had four years ago.” (Pete Goicoechea, EIS000630/07)

DOE Response 7.5.7 (105):
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 conservatisms 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 findings of liability arising from the nuclear activities of the contractor within the scope of the contract.

Response to DOE Response:
DOE’s statement that a baseline health assessment is unnecessary because “...adverse health impacts from the Proposed Action would be highly unlikely,” is unsubstantiated. While radiation exposure from incident-free shipments may be calculated as less than naturally occurring background radiation in the environment, radiation exposure resulting from an accident involving nuclear waste has the potential to create many adverse impacts to the health of the residents of Crescent Valley. An accident in which a cask suffers shield failure and radiation is released into the environment is a slim but reasonable possibility, according to DOE’s own calculations (p. J-50). As has been pointed out before, such an accident also has a
greater probability of occurring in a rural area such as Eureka County than in an urban one (p. J-60).

Additionally, this response does not take into account the possibility of freight carrying nuclear waste being parked at a junction in Beowawe while trains bound for Yucca Mountain are being made up. Radioactive freight could be parked at Beowawe, according to the Final EIS, for up to 48 hours before it is required by Federal regulations to be moved (p. 2-54). The radiation dose for a railyard worker exposed to such shipping containers would be an estimated 4.2 rem for all 24 years of operations (p. 6-84). Such an exposure rate could potentially result in health impacts greater than those that occur from naturally occurring radiation, adding an additional justification for a baseline health assessment.

Comment:
“Cancer doesn’t discriminate, doesn’t discriminate against race or economics. It’s going to affect all of us. There’s no assurance of health and safety of the long term or our future. And there’s no assurances that there will be adequate medical treatment or even compensation. Somebody spoke about compensation for losses of mining claims and whatnot. I’m talking about life. Life is very important.” (Lois Whitney, EIS000625/02)

“There will be diseases attributed from the radiation that will not discriminate by race or economics. Together we determine our environment. Let’s give it careful consideration. To all that we affect, to all that it does. Stop in the name of progress nuclear waste. Did you hear me? Stop in the name of progress nuclear waste.” (Lois Whitney, EIS000639/03)

DOE Response 7.5.7 (93):
DOE recognizes that the risk of cancer and other health effects caused by exposure to ionizing radiation is of concern to many citizens. Thus, in addition to keeping radiation doses within Environmental Protection Agency Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada (40 CFR Part 197), and Nuclear Regulatory Commission licensing criteria (10 CFR Part 63), DOE is committed to keeping radiation doses from Yucca Mountain-related preclosure activities to levels that are as low as is reasonably achievable. For example, in the vicinity of the repository (the area within 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). Similar estimates have been made for impacts to populations exposed over 10,000 years (see Table 5-7).

Although low levels of radiation exposure are estimated to result from the proposed action to construct, operate and monitor, and close the proposed geologic repository and the EIS provides estimates of latent cancer fatalities that could result from these small doses, these estimates are provided primarily to inform the decisionmaking process by enabling a quantitative comparison of impacts between the alternatives evaluated in this EIS. In all cases, estimates of latent cancer fatalities resulting from very small doses summarized in the EIS should be viewed as conservatively high; in fact, the uncertainties and conservatisms associated with these estimates (see Sections K.4.3.2 and F.1.1.5) are such that DOE believes that any adverse health impacts resulting from these exposures would be highly unlikely or nonexistent.

Response to DOE Response:
DOE asserts its intention to keep radiation exposure rates “as low as reasonably achievable,” however, Eureka County residents concerned for the health and safety of their communities obviously do not agree with DOE on the meaning of such a subjective term. Any increase in the number of latent cancer fatalities, however small, is a burden on the communities that will have to shoulder the risks involved in the Proposed Action. If the Yucca Mountain Project will raise the rate of latent cancer fatalities in the exposed public, even by a small fraction, it is incorrect for DOE to state that adverse impacts from this project would be “highly unlikely or nonexistent.”

Comment:
“The next thing in health and safety, I guess it’s been rehashed, but I would like to say it anyway, monitoring. Whose responsibility is it to monitor these things? The air quality, the ground quality, the water quality, this sort of thing. Who is to participate in this? Is it to be the federal government, the regulatory agencies, county, and where does the money come from?” (Bill Leppala, EIS000641/04)

DOE Response 8.10.2 (2740):
As discussed in Section M.5.1 of the EIS, states and tribes are primarily responsible for the health and safety of their citizens. However, Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to states for determining the need for and training of public safety officials of appropriate units of local government and tribes through whose jurisdictions it would ship spent nuclear fuel and high-level radioactive waste. This training would cover procedures for dealing with incident-free transportation and emergency response situations. It would be up to state, local, and tribal authorities to determine who would receive
transportation and what equipment would be required. DOE would provide funds for training and the associated purchase of equipment for safe routine transportation and emergency response.

In addition, several Federal agencies have training and available capabilities should states or tribes request them. If an accident with release of radioactive waste occurred, affected states and tribes could request assistance from DOE, Environmental Protection Agency, Department of Agriculture, Department of Health and Human Services, and the Federal Emergency Management Agency. These agencies, in cooperation with states, tribes, and each other, would monitor and assess radioactive materials in air, ground, agricultural products, and water in accordance with the Federal Radiological Emergency Response Plan and the Federal Radiological Monitoring and Assessment Plan. The costs for such services would be borne by the Federal agencies.

Costs associated with accidents would be borne by the transportation contractor’s insurance and by coverage under the Price-Anderson Act. The 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).

Section M.3.2 of the EIS describes the operating protocols, including monitoring of the conduct of transportation activities, that DOE’s Regional Servicing Contractors would carry out. In addition, states could require and perform monitoring of transportation activities as a part of their permitting process.

**Response to DOE Response:**

DOE’s response seems to indicate that the vast majority of the monitoring responsibilities would fall upon states, local governments, and tribes, with some assistance from Federal agencies when necessary. If this is the case, then it is necessary for DOE to disclose more details on how it intends to implement Section 180(c) of the NWPA, including when such training will take place, what exactly the training will entail, and how much funding will be made available to support both the training and the subsequent monitoring and emergency response activities.

DOE also indicates in the above response that should a release of radioactivity occur through an accident, only states or tribes could request assistance from DOE and other Federal agencies in monitoring the effects. Does this statement then mean that the local government responsible for the contaminated area would have no jurisdiction in monitoring the environment post-accident? Or would the extent of the involvement of the local government be decided upon by the state? These discrepancies – and others related to emergency response activities under Section 180(c) of the NWPA – must be clarified prior to any transportation decisions and any Record of Decision issued on this EIS by DOE.

In addition, DOE states elsewhere in the Final EIS that “[r]outine monitoring of transportation routes would not likely be performed (CR7-630).” Eureka County residents are concerned, not only about the effects a nuclear waste accident would have on their communities, but also about the amount of radiation that an intact cask will emit into the environment, in shipment after
shipment. This is especially true in the railyard or junction in Beowawe, where radioactive freight may sit for up to two days before being loaded onto a train and shipped to Yucca Mountain. Procedures, training, and funding for routine monitoring should also be developed, if a rail line is to be built.

c. Radiation Exposure

Comment:
“If an accident happens, who will be contaminated downwind/how far will the contamination reach in the air?” (Laura Mae Scott, EIS001242/12)

DOE Response 7.4 (3363):
The maximum reasonably foreseeable accident at the repository would be a large earthquake that collapsed the Waste Handling Building and damaged fuel assemblies inside the building in dry storage. For such an event, very little contamination would occur beyond the site boundary (controlled area), even under the worst weather conditions (see Table 4-37 of the EIS). The accident analysis considered dispersion of radioactive materials to a distance of 80 kilometers (50 miles). However, as listed in Table 4-37, the total exposure to the population within this distance would be very low.

Response to DOE Response:
This response does not address the possibility and consequences of a transportation accident, which could also contaminate a large area if a release of radiation were to occur. What is evident is that in calculating exposure risk, DOE used generalized exposure scenarios based upon “…atmospheric dispersion factors for neutral and stable conditions applicable to the entire country (p. J-51).” DOE did not analyze specific atmospheric conditions – and therefore the true exposure potential – for Eureka County and other parts of rural Nevada. Consequently, any calculations regarding the size and reach of accident plumes cannot be seen as necessarily representative of what could happen in Eureka County.

Comment:
A Eureka County resident living near the proposed rail route posed these questions to DOE:

“The Draft EIS acknowledges low level radiological exposure to the general public in nonaccident conditions during routine transportation of nuclear waste to Yucca Mountain…If either Carlin route is used…I can expect, according to the DEIS, approximately 12,227 personal, low level, radiologicaal exposures over 24 years…Who will monitor, manage, evaluate, and pay for the immediate and latent health consequences of this repeated and long-term exposure? How will I and my family or our heirs be compensated for the effects on our health and well being.” (Jamie Gruening, EIS000632/01)
Another commenter stated, “They plan to let it sit in Beowawe for as long as 48 hours while switching it around and it emits gamma rays even when properly packed which will increase the cancer rate here.” (Lee Louden, EIS001944/07)

In a related comment, another Eureka County resident asked, “Will every single canister be monitored for radiation? Or will a few canisters in each shipment be monitored? How will the long term health of the children of this community be affected?” (Laura Mae Scott, EIS001232/10)

“What is being done to safeguard the future generations from the effects of the continual doses of radiation that will be released as the trains travel through this area?” (Laura Mae Scott, EIS001242/11)

**DOE Response 8.7 (141): excerpts**

Exposure to the public under incident-free conditions is discussed in Sections 6.2.3.1 and J.1.3.2.1 of the EIS. An analysis was done to determine the amount of radiation exposure to the maximally exposed individual, a hypothetical person who would receive the highest dose.

The U.S. Department of Transportation routing requirements, along with regulatory requirements to limit radiation dose external to a shipping cask, help to ensure that radiation dose to persons living along routes would be low. The analysis in Chapter 6 of the EIS for the mostly legal-weight truck scenario estimates the doses 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 improve its estimates of impacts that could occur during shipments. 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 0.25 millirem per year. This is about 400 times less than the maximum dose permitted for members of the public in 10 CFR Part 20 (100 millirem).

Based on public comments, the Final EIS includes estimated public health impacts along transportation routes. This analysis accounted for factors such as the locations of intersections, commercial establishments and residences, 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.

Although DOE has characterized the environment along the candidate transportation routes and corridors in Nevada, it has not performed a baseline health assessment. DOE believes it has estimated the potential environmental impacts, including health impacts, in sufficient detail to allow decisionmakers to determine the relative merits of each transportation scenario. However, DOE would assess the environmental and engineering conditions along the selected corridor in the appropriate National Environmental Policy Act document.
The Price-Anderson Act establishes a system of financial protection (compensation for damages, loss, or injury suffered) for the public in a nuclear accident, regardless of who causes the damage. See Section M.8 of the EIS for a discussion of the Price-Anderson Act. Responsibility for cleanup of released materials would be shared between DOE, the owners of the materials, and carriers under regulation of the Motor Carrier Act of 1980.

**Response to DOE’s Response:**
While the maximally exposed individual would receive doses of radiation under regulation limits, there will still be an estimated 0.61- 0.81 latent cancer fatalities in the public as a result of incident-free transportation (p. 6-43). This figure does not take into account many of the other harmful health effects continuous doses of radiation has on human health, other than death.

In answer to one of the commenter’s questions that was not addressed in the response, DOE states elsewhere in the Final EIS that “[r]outine monitoring of transportation routes would not likely be performed (p. CR7-630).” Only in the event of an accident involving a release of nuclear materials would monitoring take place. This is not satisfactory. Eureka County residents are concerned, not only about the effects a nuclear waste accident would have on their communities, but also about the amount of radiation that an intact cask will emit into the environment, in shipment after shipment. This is especially true in the railyard in Beowawe, where radioactive freight may sit for days before being loaded onto a train and shipped to Yucca Mountain. Procedures, training, and funding for routine monitoring should be developed, if a rail line is to be built.

In response to another of the above comments that DOE did not address in its summary response, no analyses regarding the specific effects of radiation on children and ways to mitigate such effects were undertaken for this EIS. Eureka County residents are well aware that, unfortunately, radiation can affect children in their development much more profoundly than it can affect adults. DOE should address this issue as part of its analysis of the human health and safety impacts of the Proposed Action.

**Comment:**
“Now, has there been any assessment made, have there been any modeling done on what the radiation contamination is long term outside of this quarter mile corridor? Is a quarter mile corridor to be a restricted access area? And, if it is, people that live by it, what is the dosage rate for the present people, and for the future people, and the long-term effect on the things that don’t know any better, the animals, the livestock, the waterways, the wetlands, things like this.” [Bill Leppala, EIS000641/02]

**DOE Response 8.8.1 (198):**
In general, the impacts were assessed for regions of influence that extend beyond the area that would be within a rail corridor or highway right-of-way or site area of an intermodal transfer station (Sections 6.3 and J.1 discuss regions of influence used in the analyses). For example, human health effects from accidents were evaluated for populations living within 80 kilometers (50 miles) of a route (see Section 6.3.1.3.2).
As discussed in Section J.1.4.2.1 of the EIS, there would be no environmental contamination unless a severe accident resulted in a breach of containment of the shipping cask. Under incident-free conditions, there would be no environmental contamination because the spent nuclear fuel and high-level radioactive waste would not be released from shipping casks. In addition, the radiation emitted from shipping casks under incident-free conditions would have no discernible impacts on any ecological attribute (for example, groundwater and surface water, air quality, and wildlife habitat).

Plants and animals are no more sensitive to the effects of radiation than humans. Acute and chronic radiation doses that do not adversely affect humans are not known to affect terrestrial species of plants and animals. The International Atomic Energy Agency reports that there is no convincing evidence that indicates that the current radiological dose standards for humans would harm animal or plant populations (DIRS 103277-IAEA 1992). In other words, if humans are adequately protected, plants and animals are likely to be adequately protected.

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 to radioactive material in the event of a release of radioactive materials during a severe transportation accident. An 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.

**Response to DOE Response:**
While DOE addressed most of the commenter’s questions in this response, it did not respond to the inquiry over access. Is the rail corridor going to be a restricted area for members of the public? Will the corridor be fenced to discourage wildlife from entering? Questions such as these must be addressed before any transportation route is designated.

DOE states in the above response that the EIS does not specifically analyze a transportation accident in which a release of radioactivity contaminates surface water or groundwater. While the airborne pathway is the dominant exposure pathway, it is not the only way radiation could be spread into the environment. Since the a possibility of an accident in which a release of radioactivity occurs is a reasonably foreseeable scenario, it must also be reasonably foreseeable that the radiation released in such an accident could find its way into the surface water or groundwater. Not analyzing the possibility because exposure through water poses less danger than exposure through air in unsatisfactory. Exposure to radiation through water still poses danger to the population of Eureka County and therefore should be analyzed.

Additionally, the dosages received from exposure to continuous incident-free nuclear waste transportation may not, in DOE’s estimation, “adversely affect” humans and wildlife, but dosages will be received nonetheless. A maximally exposed individual living near a rail line would receive a dose of about 0.29 rem over a course of the 24-year shipping campaign, with a 0.00014 probability of contracting fatal cancer (p. 6-43).


Comment:
One commenter asked, “Will the radiation levels in our area be monitored?” (Lee Louden, EIS000621/07)

DOE Response 7.5.7 (2217):
Routine monitoring of transportation routes would not likely be performed. A release of radioactive material would be unlikely to occur during transportation activities. In the unlikely event that contamination was discovered on the external surface of a shipping cask, DOE would evaluate the potential for spread of contamination and, if necessary, monitor and contain contamination along the transportation route as part of the response plan. In the unlikely event of an accident involving the transportation of spent nuclear fuel or high-level radioactive waste, the response plan would include environmental monitoring in the vicinity.

Response to DOE Response:
DOE’s answer to the commenter appears to be that, unfortunately, radiation levels will not be monitored unless an accident causing the release of nuclear materials occurs. However, Eureka County residents are concerned, not only about the effects a nuclear waste accident would have on their communities, but also about the amount of radiation that an intact cask will emit into the environment, in shipment after shipment. This is especially true in the railyard or junction in Beowawe, where radioactive freight may sit for up to two days before being loaded onto a train and shipped to Yucca Mountain. Procedures, training, and funding for routine monitoring should be developed, if a rail line is built.

d. Economic Impacts

Comment:
Eureka County residents are concerned with the impacts that a geologic repository at Yucca Mountain could have on the tourism, recreation and agriculture based economies in Nevada and felt that these impacts should be analyzed in the EIS.

A County Commissioner commented, “We are concerned about the potential loss of market value because of the stigma of a nuclear waste rail line in the county. And with our strong agricultural base in this county, the nuclear stigma would affect not only property values but also crop prices. We are also aware that such a stigma can stymie our efforts to diversify the local economy and to attract new enterprises to this county, not to mention retaining our existing businesses. The recent nuclear accident in Japan is a case in point where both tourism and potential business were negatively impacted. The term for this is disinvestment, and we believe that this project could have that sort of impact on our county and on our state.” (Sandy Green, EIS000619/02)

Another Eureka County resident questioned “…the loss of quality of life around here because of the fact that the rail line will be going in front of our house.” (Lee Louden, EIS000621/02)
Ronald Rankin, on behalf of the Eureka County Planning Commission stated, “Also with the stigma of this rail line going through here hauling what it’s hauling, the county has expended millions of dollars for infrastructure in the Crescent Valley area. If the people that are living here now or the people that speculate to live here felt the stigma, they may move out and leave the county holding all these millions of dollars of infrastructure with nobody to use them.” *(Ronald Rankin, EIS000631/02)*

Another commenter asked, “Because no one wants to buy property in an area exposed to regular radiation leaks – who will compensate the property owners for the decreased value of their properties? How will the Crescent Valley/Beowawe area be compensated for [the detriment of] the growth and future of the community?” *(Laura Mae Scott, EIS001242/08, 09)*

DOE addressed all of the above comments in the following response.

**DOE Response 3.9 (109):**
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 decisionmaker.

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 aftereffect 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(c) 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 safe routine
transportation of these materials, as well as procedures for dealing with emergency response situations. In addition, Sections 116(a) and 117(c)(5) 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.

Response to DOE Response:
In the Final EIS, DOE has expanded its discussion of the possible economic stigma effects of a nuclear waste repository in Nevada. However, the analyses of such effects are still insufficient with regard to Eureka County and its residents. While DOE did address in more detail the possibility of economic impacts to the county, in doing so it lumped Eureka, Lander, and Esmeralda Counties into a single category known as “the Rest of Nevada, the portion of the State outside the region of influence (p. 6-115).” Eureka County’s economy has qualities different from those of Lander and Esmeralda and should be analyzed specifically and comprehensively in and of itself. Such a general overview of three counties together is insufficient and dismissive of the unique and potentially large economic impacts a rail line would have in each.

Additionally, while DOE has disclosed more information about economic impacts, it has reached many of the same dismissive conclusions on the subject as were found in the Draft EIS. In the above response, DOE refuses to identify in detail or quantify economic impacts because they are not “inevitable or measurable,” and “would likely be an aftereffect of unpredictable future events.”

Economic impacts may be, as DOE insists, difficult to quantify, but stand to have a huge effect on the lives of all Nevada residents. If a repository or transportation-related accident were to occur, the corresponding fear people would feel would likely be disproportionate to the severity of the accident: even if an accident were relatively minor and caused no release of radioactivity, many people may be deterred from living, working, or vacationing in Nevada.

However, DOE’s conclusion that the Yucca Mountain Project is “unlikely” to cause any “substantial adverse socioeconomic impacts” is based upon the assumption that there will never be an accident in the construction and operation of the project, despite the fact that the possibility of an accident is well within the realm of reasonable outcomes. DOE’s assessment of socioeconomic impacts is insufficient and dismissive of the very real probability that the economy of the State of Nevada – and by extension that of Eureka County – will suffer as a result of this project.

In the realm of transportation, DOE admits that even absent accidents property values could decline. However, DOE also says that “[m]ore research on whether property values have fluctuated with the transportation of radioactive materials would be more conclusive.” Such research must be performed before the designation of a rail route in order that the full range of impacts it will have on residents is truly known.
Comment:
“You will ruin a beautiful state and more to the point you will ruin Crescent Valley, my home… and our range where we run cattle. We make our living on cattle and have since 1871! We don’t have any other income and you would make our ranch worthless!” (Billie Filippini, EIS000480/09)

DOE Response 3.9 (11179):
A relatively short section of the Carlin Corridor passes through Crescent Valley. Definitive information is not available on specific tracts of land that could be impacted. DOE anticipates that the detailed impacts on grazing or other agricultural lands would be addressed as part of additional National Environmental Policy Act reviews for specific transportation alignments. To the extent necessary, DOE would attempt to reduce impacts by providing fencing, livestock crossings, and access to water supplies.

Response to DOE Response:
The statement that a “relatively short section of the Carlin Corridor passes through Crescent Valley” is dismissive of the many impacts a rail line would have on the residents of the area. The proposed spur is over 18 miles long and 59 percent of its private parcels are within 10 miles of the rail line. The length of the rail line in no way determines the economic impacts it will have on the residents whose property it bisects.

DOE must address specific impacts a rail line in Eureka County would have on grazing and agricultural lands, as well as make specific mitigation decisions about fencing, livestock crossings, and water supplies before the designation of the corridor as a nuclear waste transportation route.

Comment:
A representative of the Beowawe Crescent Valley Nuclear Waste Awareness Committee stated, “Some issues that have not been addressed in the EIS properly. And these are to deal with the fact of socioeconomics for this part of the world. We rely on mining and ranching at this point in this part of the country for survival. This project that you are proposing threatens our way of life forever.” (Joseph Carruthers, EIS000642/02)

DOE Response 8.11.6 (3145):
DOE developed a list of assumptions to determine the projected economic and demographic changes in Nevada by construction and operation of the proposed repository. The REMI model used in these determinations is a four-region model. Three of the regions are Clark, Nye, and Lincoln Counties. The fourth region is the Rest of Nevada, an aggregation of the other 14 counties in Nevada (including Lander County).

DOE assumed, for railroad construction, workers would be nominally assigned to base camps according to an even split by the number of camps. All railroad construction workers would commute weekly from Clark County to the trailer camps outside Clark County and would eat in local restaurants 5 days per week, 50 weeks per year. Operations workers would live in the
county where the branch rail line branched off the main line, with the exception of the Carlin routes, for which they would live in Elko, Nevada.

Given the above assumptions, the total estimated incremental population increase for the aggregated 14 counties in Nevada attributed to the Carlin Corridor would be about 115 individuals in the peak year. Total employment associated with the Carlin Corridor for the aggregated 14 counties of Nevada, including Lander County, for the peak year would be about 75. The Department does not believe there would, therefore, be any discernible direct or indirect impacts to the economy (including mining and ranching) or to the infrastructure (such as public safety or recreation) for any of the counties, including Lander County.

**Response to DOE Response:**

DOE has chosen to group Eureka County in with “an aggregation of the other 14 counties in Nevada” in order to analyze economic and demographic impacts. Eureka County, however, has its own unique economy – as do each of the 14 Nevada counties in this category – and requests that a specific analysis of the effects to its specific economy be conducted to identify impacts.

Eureka County does not agree with the statement that there would not be any “discernable direct or indirect impacts to the economy (including mining and ranching) or to the infrastructure (such as public safety or recreation) for any of the counties.” A rail line for the transportation of nuclear waste through Crescent Valley has the potential to create losses in the local mining, government, tourism, recreation, agriculture, and business sectors of Eureka County. Such impacts must be addressed by DOE and disclosed to the public.

**e. Hydrological Impacts**

**Comment:**

“On [page] 6-62, it mentions that there’s only one spring. Well, I found that not to be true. Looking on any of the maps that we have here, and there is an additional one that is below this, just so that it is on record for the water and maybe not just a spring but because wherever water comes from the ground there is one flowing well, there are six additional springs, there are six borderline springs. And I’d also like to mention of this if there ever was a problem, the old pluvial lakes that existed out here, a lot of them drained into Crescent Valley. Grass Valley and Carico Lake Valley have drainages that come into here. All this water flows from there to here. So if anything in between here and there is happening, it is unretrievable, there would be problems. Also there are three creeks that run year round that would be near this or through the proposed rail route, Steiner, Skull, Callahan, and also I might add a fourth one, Indian Creek as well, which is just right up over here. That is one of my main concerns, as well as our hot spring system that we have. Now, there are two private residences with thermal springs, and at the Hot Springs Point, the spring is undeveloped, and a lot of animal life in this valley go there for watering and for food, as well as, I might add, the Loudens, on their developed spring, and I have seen this personally, many types of migratory fowl and animals come through there as well.”

*(Joseph Carruthers, EIS000623/02)*
**DOE Response 7.5.3.1 (11001):**
The EIS identifies one spring as being inside the 0.4-kilometer (0.25-mile) corridor in which the Carlin branch line would be located. However, Table 6-25 of the EIS also identifies 10 additional springs that are outside the corridor, but within 1 kilometer (0.62 mile). The table also shows five streams or riparian areas within the corridor and two others within 1 kilometer. Names and locations of specific surface-water resources summarized in Table 6-25 are shown in Table 3-37. Without knowing what areas on the map the commenter pointed to, DOE cannot determine whether or not the commenter is aware of additional surface-water resources that should be identified in the EIS. Table 3-37 lists Skull Creek as being in the corridor and the reference to this information (DIRS 104593-CRWMS M&O 1999) shows Steiner Creek being in the corridor of a Carlin line variation (see Figure 3-23). Callaghan and Indian Creeks were not found in the reference, but other creeks in the area with different names were identified.

Section 6.3.2.2.2 of the EIS discusses impacts to wildlife from the construction and operation of a branch rail line in the Carlin Corridor. DOE believes the potential for contaminants to be released to water resources during construction or operation of a branch rail line would be minor, as discussed in Section 6.3.2.1.

**Response to DOE Response:**
During the Environmental Impact Statement process, NEPA directs federal agencies to assess all the effects of a proposed action, not just those impacts that the agency deems significant in and of themselves. DOE has chosen not to study in detail the movements of surface and groundwater in Crescent Valley because the potential for contamination these waterways would be “minor.” However, as the commenter has pointed out, the possibility for contamination and disruption of these resources does indeed exist, even if the associated risks are not as great as those of the airborne exposure pathway. DOE must, in order to fully comply with NEPA, more carefully analyze the impacts the construction and operation of a rail line might have on Eureka County’s water resources. DOE must also propose specific measures to mitigate these impacts, even if they are not deemed “significant (Forty Questions No. 19(a)).”

**Comment:**
In the subject of flood plain issues, a Eureka County Commissioner stated the following:

“We’re very concerned about the flood plain. We live here. The flood plain information is not complete and does not acknowledge the severe flooding that we have in this vicinity and also along your proposed route. The assurances on 6-47 that the operation of the branch line would be stopped during flood conditions and a flooding of the track and would not resume until the DOE has made necessary repairs. What are we going to do with that rain load of nuclear waste? Park it? How long and will the flash flood be detected in time to stop a shipment if it was in route?” (Pete Goicoechea, EIS000630/03)

Another Commissioner stated on this same subject, “One of the recurring comments I hear is that the proposed rail line is sited in a flood plain, in the playa which floods up to four feet in wet years. The draft contains information which has not been verified or ground truthed. The
information in the document is insufficient to make an informed decision about which rail route to select, and flooding is an example of this.” (Sandy Green, EIS000619/03)

A Eureka County resident commented on the same subject: “Construction of a rail line from Beowawe to Yucca Mountain crosses several lake beds that are prone to flooding in the spring and flash flooding. Wet years would cover the tracks and require building up the road bed as was required at the Great Salt Lake in 1981. No consideration was made for flash flooding in the EIS. Flash flooding has washed out roads numerous times in our short recorded history.” (James D. Sefton, EIS001503/05)

DOE Response 8.8.3 (176):
Sections 3.2.2.1.3 and 3.2.2.2.3 of the EIS present information concerning current conditions of potentially affected surface-water and groundwater resources along the candidate rail corridors, heavy-haul truck routes, and intermodal transfer station sites. Sections 6.3.2 and 6.3.3 identify potential impacts on surface-water and groundwater resources along each candidate route and site for an intermodal transfer station. Appendix L examines the effects on floodplains and areas that could have wetlands in Nevada of construction and operation and a branch rail line or intermodal transfer station associated with routes for heavy-haul trucks. The assessment in Appendix L did not evaluate potential floodplain or wetlands effects along highway routes because these existing roads should already be designed to meet 100-year floodplain design specifications. Appendix L states that if DOE decided to construct a branch rail line or use heavy-haul trucks in Nevada, a more detailed floodplain/wetlands assessment of the selected rail corridor or route for heavy-haul trucks and associated intermodal transfer station site would be prepared. However, DOE has added additional flood zone information to the floodplain/wetlands assessment in Appendix L. Specifically, the appendix now identifies 100-year flood zones crossed by rail corridors or their alignment variations if such information is available on maps published by the Federal Emergency Management Agency.

DOE would select the specific alignment within a corridor and design of a branch rail line or specific location and design of an intermodal transfer station to preclude flood water, including water from flash floods, from a 100-year flood from inundating rail track or facility operations areas. Engineering designs used as a basis for the EIS considered the potential for flooding along candidate routes and sites for an intermodal transfer station. The designs included culverts and bridges that would be needed to accommodate water from a 100-year flood.

If DOE decided to construct a branch rail line or an intermodal transfer station, it would require a hydrological analysis and evaluate the impacts of designing for floods for 25, 50, and 100 years. Critical areas might require the design to address a 100-year storm, based on appropriate engineering criteria.

As stated in the Manual for Railway Engineering, "The design flood frequency to be used is a matter of engineering judgement and economics. A number of trials should be made using a wide range of frequencies. In this way the possibilities of damage because of too small an opening can be assessed. The cost of providing for the maximum possible flood of 100 years frequency or greater can also be determined and a prudent decision made. In general practice, railroad drainage openings should be designed for floods in the range of 25 to 50 years. This does not
imply that a 100-year flood design would be out of place in certain instances” (DIRS 106860-AREA 1997).

Disturbed area estimated in Chapter 6 of the EIS for each candidate branch rail line, highway route for heavy-haul trucks, and site for an intermodal transfer station includes areas for retention basins and engineered flow channels. DOE would temporarily discontinue shipments of spent nuclear fuel or high-level radioactive waste that would use a highway or rail route where flooding could compromise safety. Shipments that were underway at the time of an ongoing or potential flooding event would be temporarily delayed at a safe, secure location along the route until the affected section of track, roadway, or intermodal transfer station was determined to be safe for use. DOE would monitor weather forecasts to ensure shipments would not occur in areas where, and at times when, the potential for flash flooding could compromise safety.

Chapter 9 of the EIS, which provides DOE’s initial list of mitigation commitments 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. Chapter 9 also identifies ongoing studies that could eventually influence mitigation measures related to the project plan and design. For example, Section 9.3 discusses mitigation measures to reduce potential impacts from the transportation of spent nuclear fuel and high-level radioactive waste nationally and in Nevada. These measures address impacts from the possible construction of a branch rail line or an 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. As suggested 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 conducted if a decision was made to select a specific rail alignment within a corridor or a specific location of an intermodal 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; 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.

Response to DOE Response:
While DOE has expanded its discussion of floodplain and related water issues in the Final EIS, more analysis is needed to accurately identify the environmental impacts associated with building a rail line through such areas. The above response states that “a more detailed floodplain/wetlands assessment of the selected rail corridor…would be prepared” only if DOE decided to designate and construct a specific transportation route. Eureka County believes, however, that in order to make such a specific decision in the first place, DOE must have more complete floodplain and water flow information. Such data will allow DOE to more accurately
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assess the impacts of a rail line and make an informed decision on which transportation route would result in the least amount of environmental disturbance and damage.

DOE must also, at this time, prepare and disclose specific mitigation measures to reduce the impacts associated with the Proposed Action. For example, in the above response DOE states that in the event of a flood, shipments of nuclear waste that were already underway would be “temporarily delayed at a safe, secure location along the route until the affected section of track…was determined to be safe for use.” This is overly vague. Specific procedures for such a situation as well as the location of a “safe, secure location” and the maximum length of time a shipment could rest at said location must be identified and disclosed.

Comment:
Regarding the Humboldt River: “The EIS provides very little analysis of the impacts of a release…of radioactivity into the Humboldt River, which is crossed many times by the existing rail, and also by the interstate if we are talking truck transport.” (Pete Goicoechea, EIS000630/08)

DOE Response 8.10 (145): excerpts
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-Sprung 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. An analysis of the potential importance of water pathway contamination for spent nuclear fuel transportation accident risk using a worst-case water
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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.

Response to DOE Response:

Despite the comments of concerned Eureka County citizens and officials, DOE chose not to “specifically analyze a transportation accident involving contamination of surface water or groundwater” in the Final EIS. The justifications for this decision – that airborne particles provide the greatest threat of exposure and that an accident resulting in a release of radioactivity is highly unlikely – are inadequate for a variety of reasons.

If contaminated, water could still pose a significant threat to both human health and safety and the environment, even though it is not the dominant exposure pathway. DOE must examine the potential contamination scenarios of all pathways, including surface water and groundwater, in order to accurately estimate the range of impacts resulting from a transportation accident. Further, DOE cannot dismiss the importance of analyzing such impacts based on the assumption that an accident resulting in the release of radioactive materials is unlikely. DOE states above that there is not 100 percent certainty that a cask would never be breached in an accident. Therefore, while unlikely, a release of radioactivity is still a reasonable possibility. And the full range of impacts of this possible outcome must be known.

DOE also states in this response that the “chance that such an accident would occur in any particular locale would be extremely low.” Yet, the Final EIS says that such an accident has a greater probability of occurring in a rural area than an urban one (p. J-60). Eureka County is a rural area and as such, its residents will have a greater chance of suffering the consequences of the Proposed Action. DOE must recognize this fact and perform a thorough analysis of impacts. DOE must also develop specific measures to mitigate the effects of such impacts on the people and environment of Eureka County.

Comment:

“I didn’t see an environmental assessment unique to our area. I didn’t see wetlands discussed, of which the Humboldt River surely qualifies. And certain periods of the year the playas certainly do. I didn’t see groundwater levels. I didn’t see permeability tables. I didn’t see migration tables for waters. These things are not addressed in there… I didn’t see anything in there also on the flood plains that we have. I didn’t see anything mentioning the migratory birds that come
through our area. I didn’t see any of this in there that was peculiar to our own area, which is important to us…” (Bill Leppala, EIS000641/05)

**DOE Response 8.11.4 (42):**
The Environmental Baseline File for Biological Resources ([DIRS 104593-CRWMS M&O 1999, all](https://doi.org/10.5194/cp-6-1-2009)) 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 the commenters 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.

**Response to DOE Response:**
As it is a response to several different comments, the above statement does not directly address the comments made by a Eureka County resident. This response states that DOE does not intend to undertake any further area-specific studies before it designates a transportation route. However, it is the position of Eureka County that more detailed analyses of the items in the above-mentioned list, such as floodplains and wildlife, must be completed prior to the designation of a transportation route. Without such analysis, impacts cannot be accurately estimated and the relative benefits and risks of each transportation route cannot be fully known.
Additionally, listing “commitments available at this time” and “mitigation measures currently under consideration” does not qualify as adequate mitigation under NEPA. These types of “paper mitigation” measures do not solve the environmental problems associated with the proposed rail line. Only specific, tangible actions qualify as adequate mitigation under NEPA. DOE must identify and disclose such mitigation measures prior to the designation of any transportation route.

f. Wildlife Impacts

Comment:
“We own a hot springs, pool and house, one-half mile from the proposed rail line and a trailer one and-a-half miles on the other side. At our hot springs, there [are] a lot of different kind of birds that come there. We have a wetlands, and there’s been about 50 different species of birds that land there and rest up before they go on to other places, and we have a lot of animals there, and if they build a railroad, all that noise is going to scare them away, and plus the train will scare them away when it comes through here.” (Nancy Louden, EIS000637/02)

DOE Response 8.11.4.2 (2719):
DOE is aware of these springs (see DIRS 104593-CRWMS M&O 1999). The corridor is more than 2 kilometers (1.2 miles) from the springs and, therefore, should not affect the riparian areas or wildlife using them. As indicated in Chapter 6 of the EIS, if DOE chose the Carlin Corridor, it would conduct additional detailed field surveys, analyses, and appropriate National Environmental Policy Act reviews to further evaluate impacts to these springs. As stated in Section 9.3.4.2, DOE is committed to minimizing and mitigating impacts of construction and operation of a transportation route on springs and other riparian areas.

Response to DOE Response:
DOE has not, at this time, given evidence of its commitment “to minimizing and mitigating impacts of construction and operation of a transportation route on springs and other riparian areas.” The impacts on the water and wildlife resources of Eureka County from the proposed rail line could be significant. DOE must identify specific, feasible mitigation measures before proceeding to designate any transportation scenario.

g. Land Use

Comment:
A representative from the Beowawe Crescent Valley Nuclear Waste Awareness Committee asked, “Will mining claims be divided and access restricted? There are many claim holders out here, people who are looking for additional mineral deposits. We feel that it is inadequately addressed in the EIS.

“Will the Cortez Mine be given its own railroad overpass to continue its daily operations? As one can see on the map on the wall, the corridor goes right through their operations. They have a mill
on each side of the valley, and these things are inadequate. They have not been addressed in the EIS, the Draft EIS.” (Joseph Carruthers, EIS000642/03)

DOE Response 8.1(3146):
If the repository proposal proceeds, final corridor selection and alignment would be necessary before determinations could be made regarding the nature and locations of crossings and other facilities. Alignment decisions could result in route locations that do not impede the operation of existing facilities.

At this time, definitive information is not available on specific tracts of land that could be required for a given transportation alternative. For any land that would be required or otherwise affected, the Department would fairly compensate landowners under Federal acquisition procedures. Should DOE be required to exercise its right of eminent domain, it would do so pursuant to applicable laws and regulations.

Response to DOE Response:
The Final EIS, like the above DOE statement, is unresponsive to the concerns raised by Eureka County residents regarding the subject of land use. Like the commenter quoted above, county residents are concerned about how the proposed rail line could affect the places in which they live and work. The statement that, “[a]t this time, definitive information is not available on specific tracts of land that could be required for a given transportation alternative,” is an inadequate base from which to evaluate the impacts of the Proposed Action. Such information must be gathered and the corresponding impacts assessed if the EIS process is to be seen as legitimate and transparent in the eyes of the public.

Further, the Final EIS is ambiguous on the issue of the Cortez mine. In one section on land use impacts, DOE states that “[t]he analysis indicates no conflicts with commercial use and no identified conflicts with scientific studies for any of the proposed corridors (p. 6-75).” Yet later, DOE admits that rail line “[c]onstruction activities could deny or interfere with access to the milling facility at Cortez (p. 6-106).” DOE discloses no information, however, on how such interference with Cortez mining operations would be mitigated. The ambiguity of this issues must be clarified with more analysis. In addition, specific and feasible mitigation measures must be identified and disclosed at this time.

Comment:
A Eureka County resident commented, “There are many people here in Nevada who are into ranching and that is their way of life and their only way of life, and we are all very concerned on this. Will the grazing allotments be cut up? How will the ranchers be compensated for the lost rangeland?” He added, “I am very concerned about the issue of water rights and the loss of land in our state.” (Joseph Carruthers, EIS000642/04)

DOE Response 8.11.6 (3147):
At this time, definitive information is not available on specific tracts of land that could be required for a given transportation alternative. For any land that would be required or otherwise
affected, the Department would fairly compensate landowners under Federal acquisition procedures. Should DOE be required to exercise its right of eminent domain, it would do so pursuant to applicable laws and regulations.

Response to DOE Response:
The Final EIS, like the above DOE statement, is unresponsive to the concerns raised by Eureka County residents regarding the subject of land use. DOE’s response does not address the subject of grazing allotments – it is important to note that ranchers do not necessarily own the land on which their cattle graze and therefore may not fall under Federal acquisition procedures.

Like the commenter quoted above, county residents are concerned about how the proposed rail line could affect the places in which they live and work. The statement that, “[a]t this time, definitive information is not available on specific tracts of land that could be required for a given transportation alternative,” is an inadequate base from which to evaluate the impacts of the Proposed Action. Such information must be gathered and the corresponding impacts assessed if the EIS process is to be seen as legitimate and transparent in the eyes of the public.

Comment:
“Will all of the private properties along the track be condemned?” (Laura Mae Scott, EIS001242/10)

DOE Response 4.1 (3361):
DOE will make no transportation decisions unless the site is approved. At that time and based on more thorough reviews of current land ownership along the selected rail alignment (if rail is selected) DOE would then determine how each tract of land held in private ownership would be obtained in compliance with all applicable laws.

Response to DOE Response:
In the Final EIS DOE states that of the five rail corridors being considered, the Carlin route has the largest range of private land affected, from 1,800 to 3,700 acres. According to DOE, “[m]ost of the private property in the Carlin Corridor is in the vicinity of Beowawe and Crescent Valley.” The issue of land ownership and how DOE would “negotiate use arrangements with owners” is obviously of significant importance to Eureka County residents (p. 6-75).

As part of the assessment of the impacts of a transportation route, DOE should conduct “thorough reviews of current land ownership” along the route at this time. DOE should also develop specific procedures on how it would acquire said property, disclose which agencies would be involved in acquisition, and make such information publicly available.

Comment:
“As for the railroad in Crescent Valley, I think that [it] would be a real burden with all the mining that is going on now for years to come. There are several well used roads that cross the
valley. The railway would destroy a lot of private land and also a lot of timber land.” (Kenneth Dugan EIS000940/02)

Another commenter asked, “Will the private property along the tracks be condemned? If so, will the property owners be given fair market value? The EIS is inadequate on this question.” (Lee Louden, EIS000621/03)

Yet another commenter stated, “The EIS was very vague on the mile wide corridor. No indication was made as to the nature of this corridor. Is it to be a ‘restricted area?’ Would it be fenced and stop traffic, livestock, as well as man from crossing the rail line? If this is the case, it would be a federal land withdraw cutting the State of Nevada in half. Restricting access in any way to the east and west would have major impact[s] on agriculture, ranching, mining, hunting, and recreation.” (James D. Sefton, EIS001503/06)

One more commenter gave this statement, “[the] EIS needs the evaluation of [the] proposed rail route from Beowawe, NV to Yucca Mtn. by [a] disinterested economic geology firm. The rail route proposed by DOE from Beowawe to Yucca Mountain through Crescent Valley will pass through or go over a highly mineralized area that has been a producer of many minerals and metals for a hundred plus years. This rail route goes through the heart of the ‘Roberts Mountain [illegible] System.’ This system has been [illegible] and many articles written about the size (50 miles wide by 100 miles long), the mineralization (especially gold) that is lying within this geologic system. [This] is what makes Nevada the third largest gold producer in the world. There are many hundreds of unpatented and patented mining claims that the rail route as proposed will have an effect on the owners. There are large mines and developed ore bodies that the rail route has to go through or over in Crescent Valley and Grass Valley. Please reconsider on your proposed Beowawe to Yucca Mountain rail route.” (Elwood R. Wright, EIS000472/02)

DOE Response 8.11.1 (134):
Section 6.3 discusses the scope of land-use information deemed appropriate for assessing potential impacts on land use of transportation implementing alternatives in Nevada. The sources of information need to identify the current ownership of the land that would be disturbed, and the present and anticipated future uses of the land. The region of influence for land-use and ownership impacts consists of land areas that would be disturbed or whose ownership or use would be changed as a result of the construction and use of a branch rail line, intermodal transfer station, midroute stopover for heavy-haul trucks, and an alternative truck route near Beatty, Nevada. These disturbances in land use would include camping, hiking, fishing, hunting, nature study, back-country travel, sightseeing, mining, ranching, timber, and wilderness areas.

In its assessment of potential land-use impacts, DOE considered the differences between land-use types, land disturbances, land ownership, and the creation of barriers. The assessment compared proposed use of land for Yucca Mountain transportation purposes to existing or other proposed land uses to estimate the magnitude and context of potential conflicts. If an action would result in continuing a current land use either due to little or no impact or through mitigation, the effects were considered insignificant or small. For example, as discussed in Chapter 6 of the EIS, impacts to livestock and Bureau of Land Management grazing allotments could be mitigated through the use of fencing, overpasses, and underpasses, which could provide
a water source to animals cut off from current sources. With these mitigating measures, the impacts would be lessened and considered small. If an action could result in departures from existing uses, and mitigation could not remedy the conflict, the effects could be more substantial.

For example, as discussed in the Carlin and Caliente Corridor sections of Chapter 6 (Sections 6.3.2.2.1 and 6.3.2.2.2), the Bonnie Claire Alternate passes directly through the portion of the newly established Timbisha Shoshone Trust Lands near Scottys Junction. If this alternate was chosen, the construction of a branch rail line could limit or enhance economic development in the Timbisha Shoshone Trust Lands parcel and could limit the use for housing by restricting access. Factors considered included the uniqueness of a geographic area; presence of historic, scientific, and cultural resources; potential effects on endangered species; and compliance with Federal, State, or local law. Based on information available, potential land-use impacts associated with Yucca Mountain transportation activities could be minimized through judicious alignment of the branch rail line or through mitigation. Overall, the land-use impacts would not be substantial because of the use of various optional and alternate routes within the corridor, mitigation measures, and the judicious routing of the branch rail line within the corridor.

Additional information about impact-reduction features, procedures and safeguards, and mitigation measures under consideration are included in Chapter 9 of the EIS. Chapter 9 identifies ongoing studies that could eventually influence mitigation measures related to the project plan and design. For example, Section 9.3 discusses mitigation measures intended to address impacts from the possible construction of a branch rail line or an 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. As suggested in the Foreword to the EIS, if DOE pursued consideration of a specific rail alignment within a corridor or a specific location of an intermodal transfer station or the need to upgrade the associated heavy-haul truck routes, more detailed field surveys, government consultation, analyses, and appropriate National Environmental Policy Act reviews would be conducted that would help ensure potential land-use conflicts associated with Yucca Mountain transportation activities were minimized.

The documents cited in Section 3.2.2.1.1 of the EIS are source documents used by DOE for land-use considerations, and they include possible future actions within the transportation corridor. The more notable land-use features and potential influences that exist on lands within the corridors are presented in Section 6.3.2. For example, the land features within the Carlin Corridor are presented in Section 6.3.2.2. The listing of communities in Section 6.3.2.2 serves two purposes: (1) to identify communities potentially affected by the Carlin Corridor and (2) as map reference points. Gold Acres and Tenabo are historic reference points in the vicinity of the Carlin Corridor. Commenters are referred to the corridor-specific parts of Section 6.3.2.2, where DOE identifies potential conflicts with existing or future land uses and land-use plans that could be affected by a given corridor.

Regarding private property along the rail corridor, DOE is required to use fair market value in the acquisition of real property. DOE must comply with the policies contained in the Uniform
Relocation Assistance and Real Property Acquisition Policies Act, Title III, which includes the provision that the Agency (DOE) offer just compensation.

**Response to DOE Response:**
Rather than thoroughly analyze all the land-use impacts of a rail line, DOE has deferred such studies until after a rail corridor has been selected. Eureka County finds this inadequate. DOE must analyze and disclose all impacts of the Proposed Action during the course of the EIS process. Only in this way can the EIS process be a meaningful and accurate tool in protecting human health and the environment. DOE has, in this instance, unfortunately stopped short of completing the task at hand.

Eureka County does not agree with DOE’s assumption that, “[o]verall, land-use impacts would not be substantial.” Fifty-nine percent of the private parcels in Eureka County are within 10 miles of the proposed corridor; “judicious routing” of the rail line within the corridor will not prevent private property from being affected. Further, impacts cannot be dismissed on the basis that they will be rendered insignificant by mitigation when such mitigation measures have not yet been identified. Suggested mitigation options do not qualify as adequate mitigation under NEPA.

The question of access raised by one of the above commenters was not addressed in DOE’s response. DOE states in the Final EIS, “[e]ach corridor has areas the public uses and areas available for sale and transfer. Each corridor crosses some roads used to access recreation areas on State of Nevada and Federal lands that are outside the corridors. As a consequence, the proposed branch rail line could result in limited access to areas currently in use by the public (p. 6-76).” DOE must, at this time, disclose more specific information on how and where access will be restricted. Specific, feasible measures to mitigate barriers to access must also be identified.

DOE is also unclear on another issue raised by one of the above commenters: mining. In the Final EIS, DOE states that there would be “[e]ffects on mining exploration if access to leases was blocked or restricted, but current mining operations probably would remain accessible (p. 6-77).” As mining is an important sector of the Eureka County economy, the full effects of a rail line in this area must be disclosed. A more definitive answer than the statement that mining operations will “probably” remain accessible is required. Specific measures to mitigate any impacts on mining must also be identified at this time.

**Comment:**
Some commenters were concerned about how a rail line might affect Crescent Valley: “…if a place were ever known as a “Peaceful Valley” this is it. Introducing a rail line or truck route through the valley would destroy a serenity not known in most areas of the U.S.A…The fragile character of this remote community would be lost if the railroad were put in.” *(Curtiss L. Eckhardt, EIS000254/02)*

“The project should offer up-front a reverter clause or a right of first refusal to recover the property ownership once the 30-year period of usage has expired. The clause should also state
that all lands will be restored to existing conditions with the reversion. The reversion price would be the price at which the land was purchased. This would have the effect of making family ownerships whole at the end of the usage term.” *(Curtiss L. Eckhardt*, EIS000254/05)

**DOE Response 8.11.1 (1015):**
The Carlin Corridor, part of which passes through Crescent Valley, is but one of five alternative rail corridors DOE considered in Section 6.3 of the EIS. Similarly, the Carlin heavy-haul truck route is only one of five alternative heavy-haul truck routes under consideration (see Section 6.3). See Sections 6.3.2.1 and 6.3.3.1 for discussions of the impacts from noise and to aesthetics in rail and heavy-haul truck corridors, respectively.

Crescent Valley has already been altered by man. There are houses, ranches, roads, and businesses in the valley, most of which are along State Route 306 between the Cortez area and Beowawe. There are historic and present-day mining operations in the vicinity of Cortez, and the effects of these operations are evident in the valley. Tailing piles, access roads, and mining facilities are evident. South of the Cortez area, there are fewer disturbances to the valley, consisting primarily of farming operations.

DOE recognizes that additional, site-specific information would be needed before it constructed either a branch rail line or upgraded roads to support heavy-haul truck shipping. DOE believes, however, that sufficient information on impacts to visual resources is provided in Chapter 6 of the EIS to help make a decision about the transportation mode (rail or truck) and the specific corridor or heavy-haul truck route (see Section 1.1 of the EIS). More detailed field surveys, government consultations, and appropriate National Environmental Policy Act reviews would be conducted if DOE made a decision to select either a specific rail alignment within a corridor or an intermodal transfer station and associated heavy-haul truck route. These additional reviews could include more detailed analyses of impacts to visual resources, as well as the identification of possible mitigation measures to minimize any impacts identified.

Sections 6.2.3 and 6.2.4 of the EIS summarize the radiological impacts of transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain. Appendix J describes these impacts in more detail. The radiation dose from routine transportation would not be likely to harm plant or animal life within the area. Sections 4.1.4 and 5.9 discuss radiation impacts to biological resources.

**Response to DOE Response:**
The second comment, which DOE indicated was summarized in this response, did not appear to be addressed. DOE must elaborate its plans regarding land use issues before any decision on a rail route is made.

The other above Eureka County commenter is obviously opposed to the proposed Carlin Corridor, which would cut through the county and bring thousands of shipments of nuclear waste past the communities of Crescent Valley and Beowawe. But instead of addressing the real issue, DOE has curiously focused much of its response to this comment on the issue of aesthetics, pointing out that activities such as mining and ranching have caused greater visible disturbances than a rail line would. It is obvious, though, that this commenter is concerned not about the
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appearance of tracks running through the valley and the sight of moving trains, but the unseen, and potentially catastrophic risk such shipments would bring into the area.

Crescent Valley has indeed already been altered by man in the ways enumerated in DOE’s response. However, such alterations do not necessarily justify further environmental degradation. Crescent Valley residents, in comments such as the one above, have expressed a reluctance to accept a project that could bring the potential of radioactive contamination to their environment.

Further, DOE states in the above response that “[m]ore detailed field surveys, government consultations, and appropriate National Environmental Policy Act reviews would be conducted if DOE made a decision to select either a specific rail alignment within a corridor or an intermodal transfer station and associated heavy-haul truck route.” As has been previously stated by commenters and Eureka County officials, DOE should conduct such studies and consultations and analyses prior to the designation of any rail route in order to accurately identify any potential impacts to health and human safety and the surrounding environment. Specific measures to mitigate such impacts must also be identified prior to any rail corridor decision.

Comment:
A County Commissioner stated, “The EIS does not have adequate information about the impacts on grazing. The EIS states that [the] fencing decision rests with the Bureau of Land Management and U.S. Fish and Wildlife. The information on fencing is not definitive and excludes local government, the local community, and most of all, those livestock permittees that will be impacted. They need input.” (Pete Goiceochea, EIS000630/04)

DOE Response 8.11.1 (12530):
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 of specific routes are discussed in appropriate subsections. The EIS determines that a branch rail line could create a barrier to livestock movement, and quantitatively addresses the acres of grazing lands potentially affected by 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 candidate rail corridors in Nevada. Should the branch rail line implementing alternative be selected and a preferred rail corridor identified, 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 mitigative actions necessary to minimize potential impacts, including land use.

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. For example, access to grazing areas, forage, and water could be addressed in the early design phase of the rail corridor/alignment. This process would address Bureau of Land Management standard operating procedures for rights-of-way, construction and operation. Water wells would be required along the rail corridor in some areas for soil compaction and dust control during rail line construction. It could be possible to improve grazing allotments if the Bureau permitted the use of this water for grazing. Grazing allotment access can be accomplished by designing at-grade structures to permit cattle to cross underneath the railbed.

Response to DOE Response:
DOE has not, in this response, answered the question of grazing impacts. Further investigation into the Final EIS document reveals that no decisions on any issues surrounding the possible disruption of grazing in Eureka County have been made. Decisions on underpasses and overpasses have been deferred to future studies, and the Final EIS seems to be curiously ambivalent on the issue of fencing, stating,

Fewer individuals of large species would be likely to be killed during operations if the corridor was fenced, but fencing could restrict animal movement and disrupt migration patterns. Furthermore, fences would require continual surveillance to prevent individual animals or herds from being trapped. Nevertheless, the demographics of small herds could be adversely affected if individuals important to the viability of the herd were struck by a train. (p. 6-82)

DOE offers no clear preference on fencing, nor makes any concrete decision. The issue remains as ambiguous here as it was in the Draft EIS, on which the commissioner was commenting.

DOE’s reliance on suggested or possible future mitigation measures instead of the identification and disclosure of specific, feasible mitigation plans is inadequate. Decisions on fencing, underpasses, and overpasses must be made before DOE can dismiss potential impacts to wildlife and the physical environment on the basis that they will be rendered insignificant through mitigation. Such determinations should also be made before DOE makes any decision on a Nevada transportation route.

Comment:
“The third area is near and dear to my heart and probably a few others in here, it is called property, taking of. The corridor as marked on the map, every other mile will probably pass through a portion of private property. Now, will this just be condemned? Will the people be compensated? Will it be assessed as market value? Will it be assessed at the BLM [Bureau of Land Management] value of the neighboring properties? Those questions weren’t answered to my satisfaction.

“Recreation and ranching, land use. We have a tremendous amount of trails, access roads, Jeep trails, some you can even barely walk on, some horses break their legs on, but they are all trails and usable all the time. We put this quarter mile corridor through here, are these trails going to be blocked off and have limited access? I didn’t find that addressed either. And if they are
blocked off and limited access, then you have just taken a lot larger portion of the property away from the citizens of the area than the quarter mile corridor.

“And that also holds true for the ranchers for their historical or their - not historical, I guess. They haven’t been here long enough to be history. But their normal ways of moving their livestock and animals and moving from place to place on their rangeland, grazing land, grazing permits, et cetera.

“The other one was the corridors. It doesn’t address that either, whether the corridors will be fenced and whether these corridors, if they are fenced, who is going to police them. The fence is just a novelty if you don’t have somebody back there to kick you out of it. (Bill Leppala, EIS000641/06)

**DOE Response 8.11.1 (2747):**
As discussed in Section 2.3.3.1 of the EIS, DOE chose candidate rail corridors in Nevada to maximize the use of Federal lands (with the exception of U.S. Air Force-controlled lands), provide access to regional rail carriers, and minimize, to the extent possible, obvious land-use conflicts. As discussed in Section 6.3.2.2, all of the candidate branch rail lines would require the use of mostly Federal land and very little private land. For example, the Caliente and Valley Modified Corridors would require the use of almost no private land (less than 1 percent). The Carlin and Jean Corridors would require only 7 and 5 percent private land, respectively.

Regarding private property along the rail corridor, the DOE is required to use fair market value in the acquisition of real property. The DOE must comply with the policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act, Title III, which includes the provision that the Agency (DOE) offer just compensation.

DOE acknowledges the recreational resources afforded by open space within parts of Nevada. In Section 6.3.2 of the EIS, DOE identifies potentially affected natural resource areas within each corridor. DOE would seek to minimize any restriction to or control over public lands used for recreational purposes and would develop specific mitigation measures to alleviate potential impediments to continued use of public lands. A branch rail line could be constructed across a trail or road access. However, access would not be restricted with the exception of that portion where the actual roadbed was constructed. Access to either side of a valley traversed by a branch rail line would be possible. Sufficient crossing structures would be constructed to allow access from either side.

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 each route are discussed in the appropriate subsection. The EIS determines that a branch rail line could create a barrier to livestock movement, and quantitatively addresses the acres of grazing lands potentially affected by proposed rail corridors.

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. For example, access to grazing areas, forage, and water could be addressed in the early design phase of the rail
corridor/alignment. This process would address Bureau of Land Management standard operating procedures for rights-of-way, construction, and operation. Water wells would be required along the rail corridor in some areas for soil compaction and dust control during rail construction. It could be possible to improve grazing allotments if the Bureau permitted the use of this water for grazing. Grazing allotment access could be accomplished by designing at-grade structures to permit cattle to cross underneath the railbed.

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. Should the branch rail line implementing alternative be selected and a preferred rail corridor identified, 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 mitigative actions necessary to minimize potential impacts, including land use.

Response to DOE Response:
Eureka County does not agree with DOE’s above statement that all of the proposed rail corridors, including the Carlin Corridor, would require the use of “very little private land.” This blanket statement ignores the fact that 59 percent of the assessed private parcels of land in Eureka County are within 10 miles of the proposed Carlin Corridor, which would affect 1,730 acres of private land along its length. In the Final EIS, DOE states that the Carlin Corridor would have the largest range of private property affected, from 7.3 to 15 square kilometers (1,800 to 3,700 acres) and that “[m]ost of the private property in the Carlin Corridor is in the vicinity of Beowawe and Crescent Valley (p. 6-75).” Eureka County residents believe the impacts on private property from the proposed rail line would be significant. Instead of dismissing such impacts, DOE should identify specific, feasible mitigation measures at this time.

In the above response, DOE states that it “would seek to minimize any restriction to or control over public lands used for recreational purposes and would develop specific mitigation measures to alleviate potential impediments to continued use of public lands.” Such statements of future intent do not qualify as adequate mitigation measures, which according to NEPA, must be specific, tangible actions that will reduce a physical environmental effect. DOE must, at this time, not only disclose any possible restrictions on recreational lands, but also identify feasible and specific measures to mitigate any such impediments.

DOE has stated its intent, in the above response, to not initiate consultations with local governments and landowners or perform additional engineering and environmental studies until a preferred rail corridor is identified. Eureka County contends that such an identification cannot be accurately made without first performing further studies and inviting local governments and residents to participate more fully in the process. The information presented in the Final EIS on the possible rail corridors is inadequate with which to make a corridor designation.
Comment:
“My family and I own the Crescent Valley Mineral Hot Springs Trailer Park and Farms which is located one and-a-half miles from the proposed rail line outside of Crescent Valley at Hot Springs Point.

“The rail line crosses between our place and town. We have a lot of concerns about the impact on our area there because it’s a major riparian area and a wildlife area.” (Lee Louden, EIS000621/01)

DOE Response 8.11.4.2 (2211):
DOE is aware of these springs (see DIRS 104593-CRWMS M&O 1999). The corridor is more than 2 kilometers (1.2 miles) from the springs and, therefore, should not affect the riparian areas or wildlife using them. As suggested in Chapter 6 of the EIS, if DOE chose the Carlin Corridor, it would conduct additional detailed field surveys, analyses, and appropriate National Environmental Policy Act reviews to further evaluate impacts to these springs. As stated in Section 9.3.4.2, DOE is committed to minimizing and mitigating impacts of construction and operation of a transportation route on springs and other riparian areas.

Response to DOE Response:
While DOE has often stated its commitment to “minimizing and mitigating” impacts of the Proposed Action, specific mitigation plans remain to be seen. Eureka County requests that DOE identify the full extent of the impacts of the proposed Carlin Corridor – including those on area hot springs – and disclose specific, feasible measures to mitigate these impacts at this time.

Comment:
“Will the rail line be single use or will there be other potential users, like the mines?…Who will own the railroad right-of-way?” (Lee Louden, EIS000621/04, 05)

Another commenter stated, “I’m particularly concerned about the details of the rail design and operation. All these details are left out. We don’t even know if it’s going – DOE hasn’t made a determination if this is going to be a single use railroad. How can you possibly evaluate the risks of rail lines without knowing what you are going to be putting on those rail lines? You can’t do it.” (Christopher Sewell, EIS000638/05)

DOE Response 8.8.2 (135): excerpts
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 the 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 the 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.

*Response to DOE Response:*
While DOE has expanded its discussion of transportation impacts in the Final EIS, it has left many questions still unanswered. Among those issues still undefined are those raised by the above Eureka County commenters. Despite these comments, DOE has not yet made a decision on whether a rail line to Yucca Mountain would be of a single or shared use. The decision on this issue has been deferred despite the fact that it will, by DOE’s own admission, have an effect on the impacts associated with a rail line. The Final EIS says that a shared branch line “could result in cumulative impacts...because of the increased rail traffic.” However, DOE has chosen not to evaluate these possible impacts because “predicting the increase in rail traffic is not possible at this time (p. 8-92).”

Decisions on factors that may have a significant effect on the impacts of a rail line must be made prior to the designation of a rail line. In order to accurately estimate the impacts of a rail line and make the most informed choice between the five corridors, DOE must resolve the issue of single or shared use.

*Comment:*
“Will the Crescent Valley airport be restricted? It goes right into the quarter mile corridor.” *(Lee Louden, EIS000621/08)*

*DOE Response 8.1 (2218):*
Until DOE selected a corridor and determined the alignment of a route in that corridor, it would be unclear if there was a potential for repository-related transportation activities to affect specific
land uses. On the other hand, DOE would consider existing uses both in its selection among the alternative corridors and the final alignment of the route in the corridor. The Department would endeavor to minimize the consequences of its routing decisions on existing uses in the selected corridor. It is unlikely that restrictions would be placed on use of the Crescent Valley airport because of DOE shipments on a branch rail line in the Carlin Corridor.

**Response to DOE Response:**
Eureka County requests a more definitive response regarding any restrictions that may be placed on the Crescent Valley airport due to the proposed rail line. Additionally, DOE should more clearly outline its plans to “minimize the consequences” of a rail line on current land uses in the Carlin Corridor.

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**Comment:**
“One question I have is what happens to the mineral and Steam rights, etc.? Personally I think the Mineral etc. rights should still belong to the owners of the land at the time of the Sale to the Gov.” (Margaret E. Meharg, EIS002068/03)

**DOE Response 8.11.1 (6986):**
Sections 6.3.1, 6.3.2, and 6.3.3 of the EIS address the potential impacts of Nevada legal-weight truck, heavy-haul truck, and branch rail line implementing alternatives, respectively, including land-use impacts. These sections recognize and describe the impacts related to rights-of-way acquisition for branch rail lines and developing or upgrading highways. The Department is interested in acquisition of rights-of-way or land withdrawal from public and private land only for constructing and operating a branch rail line or expanding existing roads for heavy-haul trucks. The acquisition of mineral or steam rights would not be sought.

**Response to DOE Response:**
Eureka County has no further comments on DOE’s response.

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**Comment:**
“Will mining claims be divided and access be restricted? Will the free access of the residents be restricted across the valley (across the tracks)?” (Laura Mae Scott, EIS001232/09)

**DOE Response 8.11.1 (4465):**
A branch rail line could be constructed across a mining claim. However, access to claims would not be restricted with the exception of that portion where the actual roadbed was constructed. Access to either side of a valley traversed by a branch rail line would be possible. Sufficient crossing structures would be constructed to allow access from either side.

**Response to DOE Response:**
DOE did not mention in the above response that mining operations could be disrupted “if access roads were temporarily blocked or altered” during the construction phase of a rail line. In the
Final EIS, DOE also admits that the rail line may divide some mining claims, “making development of a claim less profitable if access became a problem (p. 6-76).” While DOE has not named any specific impacts to long term mining operations as a result of a rail line, neither has the agency definitively ruled them out, stating only that “current mining operations probably would remain accessible (p. 6-77).”

**h. Accident Scenarios and Liability**

*Comment:*
Eureka County residents were concerned that the Draft EIS did not analyze a sufficient variety of possible transportation accidents. Specifically, many County residents stated that the EIS should analyze the impacts of a crash between a military airplane and a nuclear waste rail car.

*DOE Response 8.10 (154):*
An aircraft crash into a spent nuclear fuel or high-level radioactive waste cask would be extremely unlikely because the probability of a crash into such a relatively small object, whether stationary or moving, is extremely remote. Nonetheless, Section J.3.3.1 of the EIS analyzes consequences of an accident in which a large commercial aircraft or a military aircraft is hypothesized to impact directly onto a cask. The analysis showed that the heavy shield wall of a cask could not be breached by the center shaft’s penetrating force. With the exception of engines, the relatively light structures of an aircraft would be much less capable of causing damage to a cask. A resulting fire would not be sustainable or able to engulf a cask long enough to breach the integrity of the cask.

System malfunctions or material failures that could result in either an accidental release of ordnance or release of a practice weapon were discussed in the *Renewal of the Nellis Air Force Range Land Withdrawal: Legislative Environmental Impact Statement* (DIRS 103472-USAF 1999), and the *Final Environmental Impact Statement, Withdrawal of Public Lands for Range Safety and Training Purposes, Naval Air Station Fallon, Nevada* (DIRS 148199-USN 1998). The *Special Nevada Report* (DIRS 153277-SAIC 1991) states that the probability of dropped ordnance resulting in injury, death, or property damage ranges from about 1 in 1 billion to 1 in 1 trillion per dropped ordnance incident, with an average of about 1 in 10 billion per dropped ordnance incident. Less than one accidentally dropped ordnance incident is estimated per year for all flight operations over the Nellis Air Force Range (now called the Nevada Test and Training Range) and Naval Air Station Fallon. All of these analyses are incorporated in this EIS by reference. Spent nuclear fuel transportation would not affect the risk from dropped ordnance or aircraft crashes. The EIS does not evaluate radiological consequences of an impact of accidentally dropped ordnance on a shipping cask because the probability of such an event (about 1 in 10 billion per year) is so extremely low that it is not reasonably foreseeable. Accordingly, the Department believes there would be no need for associated mitigation measures and no impacts on military operations.

*Response to DOE Response:*
DOE has expanded its discussion of potential accident scenarios to include an analysis of the possibility of a crash between an aircraft and a nuclear waste shipping cask, as commenters had requested. However, the results of this analysis – that the shielding integrity of a cask would not
be compromised by such an accident – remain questionable. DOE must conduct full scale cask testing to determine the limits of a shipping container’s shielding capabilities in its actual, physical reality. Basing such conclusions of safety on computer modeling alone does little to inspire public confidence in the proposed shipping campaign and leaves much room for error.

Comment:
“Where does the liability lie in the event of a major accident?” (Lee Louden, EIS000621/09)

DOE Response 4.1 (82):
In the event actions were to occur 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, as amended, provides liability coverage for commercial activities operating under a license from the Nuclear Regulatory Commission and DOE activities. The Price-Anderson Act 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 Federal 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 findings of liability arising from the nuclear activities of the contractor within the scope of the contract. However, to ensure compliance with safety requirements and to minimize risk, DOE is required to undertake enforcement actions against indemnified contractors for violations of nuclear safety requirements.

In addition to Price-Anderson indemnification, all motor vehicles carrying spent nuclear fuel or high-level radioactive waste are required by the Motor Carrier Act of 1980 and its implementing regulations (49 CFR Part 387) to maintain financial responsibility of at least $5 million, which would be available to cover public liability from a non-nuclear incident and for environmental restoration. Federal law does not require rail, barge, or air carriers of radioactive materials to maintain liability coverage, although these carriers often voluntarily carry such insurance. Regardless of whether these carriers had insurance, a radioactive materials incident involving these carriers would be subject to state law applicable for any other type of accident.
It should be noted that the Price-Anderson Act requires DOE to enter into indemnity agreements with any of its contractors that conduct nuclear activities until August 1, 2002. As discussed in Section M.8 of the Final EIS, DOE has recommended renewal of the indemnification provisions of the Act. In particular, DOE recommended that (1) DOE indemnification should be continued without any substantial change; (2) the amount of the DOE indemnification should not be decreased; (3) DOE indemnification should continue to provide broad and mandatory coverage of activities conducted under contract for DOE; and (4) DOE should continue to have authority to impose civil penalties for violations of nuclear safety requirements by for-profit contractors, subcontractors, and suppliers.

Response to DOE Response:
In addition to the information provided by DOE in the above response, it must be noted that the main function of the Price-Anderson Act is to limit the liability of the nuclear industry and private contractors handling nuclear waste (including nuclear waste shippers) in the event of a major nuclear accident.

Price-Anderson provides no liability protection or compensation whatsoever unless an incident causes a release of radioactivity or an authorized evacuation. If a release of radioactivity does occur, the best chances for an affected member of the public to actually recover damages through Price-Anderson appear to be associated with only the most severe of accidents. One would have to sue to recover damages, which would require attorneys and expert witnesses. The litigation process necessary to win compensation could be protracted, except in cases where a settlement with DOE is reached.

In the event of a nuclear incident in Eureka County, some residents could suffer latent, rather than immediate, effects of radiation exposure. In the case of latent effects, an expert witness in a personal injury case, arguing that the defendant’s cancer was caused by radiation exposure, faces a difficult task. It could be extremely difficult, if not impossible, to prove causation.

Additionally, despite Price-Anderson’s broad coverage, it excludes from coverage shipments from an independent fuel storage installation, and transportation accidents where material is stolen and later released (Ziegler, 2003).

Comment:
“…because of the large percentage of this spent nuclear waste coming out, or being stored, how much of it is coming from private industry and are they going to pay their fair share? Knowing full well that 30, 40, 50 years ago we entered into an agreement where they gave into a government insurance policy. With our present rate of inflation and the way we use our money, that money is probably gone. So are they going to be required to up the ante, so to speak, to cover the additional costs of this storage and transportation of spent fuel?” (Bill Leppala, EIS000641/07)
As described below, approximately 70 percent of the estimated repository-related costs would be funded by commercial nuclear power generating utilities via the Nuclear Waste Fund. The Nuclear Waste Fund would cover the costs associated with disposal of commercial spent nuclear fuel. The remaining 30 percent would be funded by taxpayers, which would cover the Federal Government’s portion of the costs related to the disposal of high-level radioactive waste, spent nuclear fuel from the Naval Nuclear Propulsion Program, and spent nuclear fuel from defense and research reactors.

In the "Findings" section of the Nuclear Waste Policy Act of 1982, Congress stated that "...while the Federal Government has the responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment, the costs of such disposal should be the responsibility of the generators and owners of such waste and spent fuel..." Since the passage of the Act, nuclear power generating utilities and their ratepayers have paid about $9.8 billion into the Nuclear Waste Fund to pay for development of a repository. Expenditures from the Fund have been used exclusively for the purposes specified in the Act, such as site characterization, facility design, and site recommendation studies.

Section 302 of the Nuclear Waste Policy Act of 1982 specifies that funding for disposal of commercial spent nuclear fuel is provided by payment of fees to the Secretary of Energy by the generators of electricity from nuclear power plants. Equivalent amounts are paid by the Federal Government to cover costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. Utility fees and Federal appropriations are required to be sufficient to offset expenditures associated with repository studies, transportation, and operations and closure of a repository, as determined by an annual review by the Secretary of Energy. The utility fees and Federally funded share are subject to change based on a required annual review of adequacy. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. Excess funds for any given year, as determined by the Secretary of Energy, are invested in obligations of the United States and earn interest. The Secretary of Energy makes expenditures from the Nuclear Waste Fund subject to appropriations by Congress. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing spent nuclear fuel (including spent nuclear fuel from foreign countries subject to the conditions of the Nuclear Non-Proliferation Act of 1978 or with Presidential approval) and high-level radioactive waste generated or owned by the United States. These materials were produced primarily at DOE defense production facilities. As noted above, taxpayers fund only the management and disposal of DOE produced and owned materials; disposal of commercial spent nuclear fuel is funded by the generators. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and about 30 percent from taxpayer revenues. This percentage is based on the space required to dispose of defense-related spent nuclear fuel and high-level radioactive waste. Thus, the commercial utilities are "paying their fair share" of repository program costs along with taxpayers.

As reported in *Nuclear Waste Fund Fee Adequacy: An Assessment*, the nuclear waste fund investments had a market value of $8.5 billion as of September 30, 1999 (DIRS 153257-DOE 82)
The analysis in the report found that the current fee of 1 mil (one-tenth of one cent) per kilowatt-hour charged to generators of commercial spent nuclear fuel is adequate to cover projected disposal expenses (including costs associated with packaging and transportation) and recommended that the fee remain unchanged.

In 1988, the Price-Anderson Act was amended to provide liability coverage to DOE activities (including transportation) involving spent nuclear fuel, high-level radioactive waste, and transuranic waste. The Price-Anderson Act provides liability coverage for DOE and commercial activities operating under a license from the Nuclear Regulatory Commission by establishing 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, regardless of who causes the damage. Payment would be from Federal 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 the Nuclear Waste Fund. Appendix M of the Final EIS contains more information.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

i. Emergency Response

Comment:
Eureka County residents are concerned about emergency response in the event of a nuclear accident. One commenter asked if state highway patrolmen carried monitoring devices for performing radiation checks in the event of an accident, because a radiation survey would need to be performed immediately. He wanted to know, in the event of an accident involving nuclear waste, “...if and when we would be able to have monitoring devices, because we’re on site and we’re here where it’s going to take Hazmat, FEMA, or any other agency a long time to get to us. We need to take a radiation check immediately to know whether it is a clear area. I was interested in knowing would they take and provide the devices, the training for the people, then back us up when we need to use that equipment.” (Bruce E. Denning, EIS000647/01)

DOE Response 8.10.2 (218): excerpts
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 it would transport spent nuclear fuel and high-level radioactive waste. In 1998, DOE published a Notice of Revised Proposed Policy and Procedures in the Federal Register (63 FR 23753; April 30, 1998) that sets forth the proposed mechanisms for implementing the requirements of Section 180(c). As part of this program, about 4 years prior to the first shipments eligible jurisdictions would receive a one-time planning grant to assess their training needs. In accordance with the Draft Section 180(c) Policy and Procedures, jurisdictions may use a certain percentage of their financial assistance to purchase appropriate (for example, training-related) equipment that can be used for training, inspections, and for emergency response. This could include the detection equipment mentioned in the comment. See Section M.6 of the EIS for a detailed discussion of the Section 180(c) provisions and emergency
response programs. If requested, DOE and other Federal agencies could assist in responding to an incident.

DOE has several programs available to provide assistance to state, tribal, and local governments in response to radioactive material accidents. The Radiological Assistance Program, for example, provides trained personnel with equipment to evaluate, assess, advise, and assist in the mitigation and monitoring of potential immediate hazards associated with a transportation accident. As part of the program, DOE maintains eight Regional Coordinating Offices across the country that are staffed 24 hours a day, 365 days a year. The staff consists of nuclear engineers, health physicists, industrial hygienists, public affairs specialists, and other personnel who provide field monitoring, sampling, decontamination, communications, and other services, as requested. In addition, DOE’s Radiation Emergency Assistance Center/Training Site (REAC/TS) focused on providing rapid medical attention to people involved in radiation accidents. REAC/TS maintains a 24-hour response center to provide direct support, including deployable equipment and personnel trained and experienced in the treatment of radiation exposure to assist Federal, state, tribal, and local organizations.

Response to DOE Response:
While DOE has expanded its discussion of emergency response activities in the Final EIS, many issues still remain unclear. DOE should specifically outline its plans regarding Section 180(c) of the NWPA as it relates to local governments. To enable Eureka County to anticipate its requirements for participation in emergency response training activities, DOE must disclose a more specific and definite timetable for such activities. Emergency response procedures are an important aspect of mitigation for the Proposed Action. DOE must disclose specific, feasible mitigation measures at this time.

Comment:
On the subject of emergency management and response, a County Commissioner stated, “The Draft EIS is inadequate in its analysis of local government demands related to public health and safety. The county will be submitting detailed comments in this area as well, and I understand that’s been the policy all along that we’re going to wait until we’re five years from shipment before we’re going to start equipping and training these people. That is completely inadequate. There does not appear to be an analysis or discussion for the potential activities and cost needed during all the phases of emergency management and the response, including preparedness response and recovery times.” (Pete Goicoechea, EIS000630/05)

The Eureka County Local Emergency Planning Committee also commented on the same subject:

“The Eureka County Local Emergency Planning Committee is deeply concerned that the Draft Environmental Impact Statement (DEIS) lacks information, analysis and mitigation measures regarding emergency response and emergency management as it relates to the transportation of high-level nuclear waste shipments. Most specifically, we are concerned that the DEIS does not address the potential impacts to Eureka County emergency services and emergency management activities due to the proposed Carlin rail corridor alternative.
“The Draft EIS does not address the impacts on local governments for emergency management and response activities necessary to deal with potential radiological accidents during transportation. There is not analysis or discussion of the potential activities and costs needed during all phases of emergency management and response including mitigation, preparedness, response and recovery phases.

“We believe that emergency management impacts should include the following general items:

- Need for emergency management planning
- Improvement/revision of the County Emergency Operations Plan
- Preparation/improvement of local emergency plans
- Preparation/improvement of evacuation and transportation planning
- Improvement of resource lists
- Need for emergency public information and education programs for potentially affected populations
- Need for cooperative aid agreements
- Need for contractual agreements for response services
- Costs for:
  - Emergency management planning improvements
  - Emergency management program improvements
  - Emergency response training and equipment
  - Emergency response personnel
  - Emergency response actions
  - Recover activities and costs
  - Contracted emergency response services (i.e., private emergency response teams)

“The description of rail line operations is vague and incomplete; particularly regarding safety and emergency actions necessary for response to accidents. Additionally, the Draft EIS does not address the fact that local emergency resources are scarce in most of the area impacted by the Nevada transportation alternatives, with the possible exception of Clark County. The scarcity of resources may increase the severity of injury and negative impacts of any transportation accidents or incidents.

“Since Eureka County is a small rural jurisdiction, we are generally concerned regarding the increased risks the project presents to our paid law enforcement personnel and volunteer fire and rescue personnel. We do not believe the DEIS adequately addresses the need for and measures necessary to mitigate the impacts that will occur due to the proposed action and more specifically, the Carlin rail alternative.” (Mike Rebaleati, EC Local Emergency Planning Committee, EIS000950)

DOE Response 8.10.2 (212): excerpts
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 it would transport spent nuclear fuel and high-level radioactive waste. The training would cover procedures required for safe routine transportation of these
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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 DOE 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(c) 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. 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 incidents. Major hospitals are equipped to deal with radioactive contamination because they routinely handle medical radioisotopes. In cases where there is no training or procedures to handle a contaminated individual, assistance can be obtained from the DOE Radiation Emergency Assistance Center/Training Site (REAC/TS). REAC/TS is on call 24 hours a day to provide direct or consultative help when people have been involved in a radiation accident.

As with any transportation accident, state and tribal governments have primary responsibility to respond and to protect the public health and safety in their jurisdictions in accidents involving radioactive materials. This includes providing and managing emergency response capabilities. Although DOE would provide the funding for Section 180(c) activities, each state and tribe would determine how it would administer that funding.

At present, DOE intends to purchase services and equipment from Regional Servicing Contractors, who would perform waste acceptance and transportation operations. Each Regional Servicing Contractor would be required to provide detailed written procedures for how it would respond to an incident and arrange for repair/replacement of equipment or recovery, as appropriate. In accordance with ANSI Standard N14-27 (DIRS 156289-ANSI 1987), the carrier is expected to provide appropriate resources for addressing the consequences of an accident, isolating and cleaning up contamination, and maintaining working contact with the responsible governmental authority until the latter has declared the incident to be satisfactorily resolved and closed. Section M.3 of the EIS contains more detail on the proposed role of the Regional Servicing Contractors.

Existing Federal and state regulations and DOE documents delineate responsibility for duties connected with emergency situations. Section M.5 of the EIS contains additional information on emergency response.
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.

Response to DOE Response:
As the County Commissioner stated in his above comment, the amount of time allotted for emergency response training is inadequate. According to the above statement, emergency response preparation activities will commence only four years prior to the actual shipments. Being that Eureka County is a relatively small jurisdiction with limited resources, many drastic changes will have to be made to the County’s current emergency response management capabilities in order to accommodate the severe risks involved in the transportation of nuclear waste. Four years may prove to be too small a period of time in which to adequately prepare for such risks.

DOE’s response has not addressed the issue, raised in the above comments, that local emergency resources are extremely scarce in a rural area such as Eureka County. The scarcity of these resources could significantly increase the severity of injury and negative impacts resulting from a transportation incident. Risks would be higher because of the lack of initial response capability and the time delay for responding personnel. DOE has stated that a one-time planning grant of $150,000 will be given to States and Native American jurisdictions to conduct an assessment of their needs for emergency response. Studies under this grant could aid in identifying and resolving such first-response issues; however, local jurisdictions like Eureka County are not actually allowed to apply directly for these or any Section 180(c) funds. Instead, the County would have to work with the State to secure any funding. In addition, such funds would not be made available until three years prior to nuclear waste shipments, which is an inadequate amount of time in which to both identify and prepare for any emergency response situations that might arise (p. M-21).

While DOE has expanded its discussion of emergency response, it has left a multitude of issues unresolved. DOE has not addressed the above comment regarding rail line operations: how can the extent of the necessary emergency response capabilities be known when so many specific details of how the rail line will be operated have not yet been defined or disclosed? Despite the requests by one of the above commenters, DOE has neglected to mention any specifics on the costs of emergency management and response. The issue of whether the affected public will receive information and education on emergency management also remains unclear. And while Eureka County officials are certain that four years will be an insufficient amount of time in which to prepare emergency response capabilities, it is difficult for the County to estimate the appropriate length of time necessary when the details of what such preparations entail have not yet been disclosed by DOE.

Eureka County officials are concerned about the impacts on public health and safety from incidents, accidents, and emergencies. Such impacts could be significant and DOE must disclose
specific mitigation measures at this time. Merely encouraging local jurisdictions to work with the State to secure funding under Section 180(c) of the NWPA does not qualify as adequate mitigation under NEPA.

Comment:
A commenter who volunteers for the Crescent Valley Fire Department was concerned about his fellow members of the Fire Department and EMS service, “…if they should become involved in a nuclear accident, or exposure. And I wonder what provisions are going to be provided for that family and the loss of income while that member is going through treatment and possibly even long-term treatment that may end his career. These are very important issues to my people.”

(Kevin L. Jackson, EIS000649/01)

DOE Response 8.10.2 (194): excerpts
In response to public comments, DOE has modified Section 6.2.4.2.1 of the EIS to include estimated radiological impacts to emergency personnel who would respond to transportation accidents. The analysis assumed a first responder would be trained and would follow guidance in the 2000 Emergency Response Guidebook (DIRS 155776-DOT 2000) when responding to transportation accidents involving shipments of radioactive materials. The maximum estimated dose to a first responder would be 830 millirem. This dose, which is about 40 percent of the limit for annual dose to radiation workers at DOE facilities, would lead to an increase of about 0.03 percent in the individual’s lifetime risk of a latent fatal cancer. Health care professionals would likely receive smaller doses from caring for radioactively contaminated accident victims or workers.

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 or incident. The Price-Anderson Act 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, regardless of who causes the damages. Beyond that level, Congress will consider further action it determines is necessary to provide full and prompt compensation to the public. The Price-Anderson Act indemnifies all persons liable for the nuclear damage including state, local, and tribal governments, emergency response workers, health care personnel, victims, and any other citizens or members of the public.

Response to DOE Response:
In addition to the above response, it must also be noted that if a release of radioactivity does occur, the best chances for an affected emergency responder to actually recover damages through Price-Anderson appear to be associated with only the most severe of accidents. One would have to sue to recover damages, which would require attorneys and expert witnesses. The litigation process necessary to win compensation could be protracted, except in cases where a settlement with DOE is reached.

In the event of a nuclear incident in Eureka County, some emergency responders could suffer latent, rather than immediate, effects of radiation exposure. In the case of latent effects, an
expert witness in a personal injury case, arguing that the defendant’s cancer was caused by
radiation exposure, faces a difficult task. It could be extremely difficult, if not impossible, to
prove causation and receive compensation (Ziegler, 2003).

Comment:
“Then again, who is going to train these people? And to what level of training will they receive?
Will they receive training to handle all aspects, all types of emergencies, and/or spills and/or
exposures? And then will they, too, be monitored?” (Bill Leppala, EIS000641/08)

DOE Response 8.10.2 (114):
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 any 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. Additional information on emergency response following an accident is
provided in Section M.5.

As described in Section M.5 of the EIS, as with any transportation accident, state and tribal
governments have primary responsibility to respond 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 would determine how it would
administer that funding. 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 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.

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. Based on interactions with
stakeholders, DOE believes that this would be sufficient time for emergency responders to
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receive the training to prepare them to respond to an accident involving DOE shipments. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

If there was an accident involving a shipment to the proposed repository, the first responders and response time would be the same as those for any transportation accident. The primary public health and safety issue would be emergency care for those involved in the accident and the safety of those who responded. As discussed in Appendixes J and M of the EIS, accidents involving a spent nuclear fuel or high-level radioactive waste shipment would be likely over the proposed shipping period. Most real-world accidents that have been postulated, including truck crashes into bridges, train derailments followed by fires, derailments followed by immersion of a cask into a river, and similar extreme accident conditions, would not be likely to result in release of radioactive materials from the shipping casks.

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, for example, provides trained personnel with equipment to evaluate, assess, advise, and assist in the mitigation and monitoring of potential immediate hazards associated with a transportation accident. As part of the program, DOE maintains eight Regional Coordinating Offices across the country that are staffed 24 hours a day, 365 days a year. The staff consists of nuclear engineers, health physicists, industrial hygienists, public affairs specialists, and other personnel who provide field monitoring, sampling, decontamination, communications, and other services, as requested. In addition, DOE’s Radiation Emergency Assistance Center/Training Site (REAC/TS) focuses on providing rapid medical attention to people involved in radiation accidents. REAC/TS maintains a 24-hour response center to provide direct support, including deployable equipment and personnel trained and experienced in the treatment of radiation exposure, to assist Federal, state, tribal, and local organizations.

 Recovering 23-metric-ton (25-ton) truck casks or rail casks weighing up to 140 metric tons (150 tons) loaded with spent nuclear fuel would involve methods commonly used to recover heavy trucks following truck accidents or railcars and locomotives following rail accidents. Capability to lift such weights exists for rail and truck modes and would be deployed as required. Railroads use emergency response contractors with the capability to lift derailed locomotives that could weigh as much as 140 metric tons.

At this time many years before shipments to the proposed repository at Yucca Mountain could begin, DOE is not ready to make decisions on which specific transportation routes would be used for shipping spent nuclear fuel and high-level radioactive waste. The routes used in the EIS transportation analyses might not be the routes used for actual shipments. The route selection process would be conducted in accordance with applicable U.S. Department of Transportation regulations on route selection, state or tribal routing designations allowable under existing regulations, and the processes described in Section M.3.2.1.2 of the EIS. Section J.4 identifies the representative truck and rail routes DOE used in the impact analyses.
Response to DOE Response:
DOE has prefaced several of its statements about emergency management and response by citing the fact that the likelihood of an accident causing the release of radioactivity is very unlikely. While unlikely, such an accident scenario is within the realm of reasonably foreseeable possibilities and therefore must be prepared for to the fullest extent possible. Statements on the likelihood of such an accident taking place are therefore not relevant in the discussion of emergency response.

While DOE has somewhat expanded its discussion of emergency response, questions as specific as those asked in the above comment remain unanswered. The level of training that emergency personnel will receive does not yet seem to be determined. DOE states in the Final EIS that it will provide jurisdictions funding and assistance to obtain and maintain “awareness-level training” for emergency response. Assistance could be used to obtain “an enhanced level of emergency response capability,” such as operations-level training, technical-level training, and refresher training, only “to the extent funds were available (p. M-21).” The admission that thorough emergency response training will depend on the uncertain availability of future funds does not inspire public confidence in DOE’s commitment to ensuring the safety of the transportation process. “Awareness-level training” alone may prove to be inadequate preparation for the risks involved.

Comment:
“And another thing with this being the second [most populated] area of the county, since it is such a rural and isolated area, the response time for an emergency team to come in, should there be an accident…a fire department wants to be there in just a few minutes. This stuff is much more dangerous than a fire. And where are they going to come from?” (Ronald Rankin, EC Planning Commission, EIS000631/03)

DOE Response 8.10.2 (203):
In response to public comments, DOE has added information (see Appendix M of the EIS) on the proposed operational aspects of spent nuclear fuel and high-level radioactive waste transportation, the safety of transportation casks, emergency response planning, and financial assistance programs (see Section M.5). In addition, 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 presents consequences for accidents that could release radioactive materials.

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 environment and 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 impact assessment considered 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, estimated exposures would be reduced. Standard emergency response actions could reduce or prevent radiological exposures. The transportation analyses do take into account the differing transportation accident rates in rural and urban areas in calculating accident probabilities.

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 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. See Section M.6 of the EIS for a discussion of the DOE Section 180(c) policy and procedures.

If there was an accident involving a shipment of spent nuclear fuel or high-level radioactive waste, the first responders and response time would be the same as for any transportation accident. If a release occurred, and local officials were not prepared to deal with it, immediate assistance could be obtained from the DOE Radiation Emergency Assistance Center/Training Site. Appendix M of the EIS contains additional information that addresses these issues.

Response to DOE Response:
DOE has prefaced several of its statements about emergency management and response by citing the fact that the likelihood of an accident causing the release of radioactivity is very unlikely. Whether an accident is likely or not, it is possible. Since Eureka County is responsible for first response and public health and safety, the County must plan to be prepared. Statements on the likelihood of such an accident taking place are therefore not relevant in the discussion of emergency response. Additionally, DOE states above that “[t]he corresponding chance that such an accident would occur in any particular locale would be extremely low.” It must be pointed out that, despite this statement, the Final EIS clearly demonstrates that the maximum reasonably foreseeable accident has a greater probability of occurring in rural area, such as Eureka County, than in an urban one (p. J-60).
In the above statement, which was a summary response to a number of different comments, DOE has not directly addressed the issue raised by the Eureka County resident. DOE merely states that in the event of an accident, “the first responders and response time would be the same as for any transportation accident.” This is exactly the problem. Local emergency resources are scarce in a rural area such as Eureka County. The scarcity of these resources could significantly increase the negative impacts resulting from a transportation accident due to the lack of initial response capability and the time delay for responding personnel. DOE must take account this fact in its emergency response assistance planning. Mitigation measures, which should be disclosed at this time, must also take into account the current and future limits of emergency response capabilities in a rural area such as Eureka County.

\section*{Alternatives}

\textbf{Comment:}

A County Commissioner stated, “The EIS is also insufficient because it does not consider the possibility of roads other than interstates when we’re talking highway mode, truck mode of transportation to Yucca Mountain. The study done by the Nevada Department of Transportation several years ago indicated that likely routes could be the A and B routes, both of which run south from Wendover to Ely on the way to Yucca Mountain. If either one of these were ultimately designated into highway transportation, Eureka County could be the host for an alternate routing, either I-80 or Highway 50 across the southern part of the county. The EIS does not address alternate routing in the event of an accident, construction, or weather, and it should.” (\textit{Pete Goicoechea}, EIS000630/06)

Regarding highway transportation, another commenter also stated: “...the EIS does not look at what is known as the A and B routes, which [are] routes identified in a Nevada Department of Transportation study done several years ago for likely alternate routes other than interstates to take nuclear waste to Yucca Mountain. These routes are currently being used to take low level waste through Ely to Yucca Mountain from Wendover from Interstate 80, and we think that the A and B routes should be included in an analysis of routing to Yucca Mountain. We think it’s likely in the reasonable forseeable future that if Yucca Mountain were to come to be, that the A and B routes would be considered, might be used...once we’re at that point...we have to look at alternate routes to the A and B routes. If there is some sort of calamity, catastrophe, bad weather on the A and B routes, how are those trucks going to get to Yucca Mountain? Well if there’s some problem south of Wendover, they might continue on Interstate 80 and take some other way down to Yucca Mountain. If there’s some problem on US-6, they might go on Highway 50 in order to get over to 376 and down Big Smoky Valley to Tonopah. The EIS doesn’t talk about that at all. And it should. We think that in looking at the impacts of the Yucca Mountain project in its totality, on our county, that that’s something that should be considered, and it’s not in there.” (\textit{Abby Johnson}, EIS000618)

\textit{DOE Response 8.3.1 (195):}

As described in Section J.1.1.2, the analyses in the EIS used highway routes that conform to U.S. Department of Transportation regulations (49 CFR 397.101). These regulations require the shipments of radioactive material to be made on preferred routes to reduce 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’s identification of Routes A through F (A and B pass through White Pine County) as potential alternative highway routes for legal-weight truck shipments to Yucca Mountain (see Section J.3.1.3). However, these are not yet formally designated alternative preferred routes.

For completeness, Section J.3.1.3 of the EIS evaluates all six of the Nevada Department of Transportation routes, including Nevada Department of Transportation routes A and B, as sensitivity analyses to provide comparisons with the currently allowed preferred routes. The data needed to characterize the Nevada Department of Transportation routes to support the impact calculations is equivalent to the data collected for the base Case routes. Tables J-47 and J-48 present the results of the sensitivity evaluations, including the impacts nationally and within Nevada, based on the mostly legal-weight truck scenario. The various impacts would generally be small for all cases, but for routes A and B they should be about a factor of 1.5 times greater than the route used for the EIS analysis. All direct environmental factors are addressed for Nevada transportation in the EIS (see Section 6.3.2).

Section M. 3.2.1.4 of the EIS includes information on the procedures to be used in the event of adverse weather or road conditions.

Response to DOE Response:
DOE has expanded its transportation analysis in the Final EIS to include a short discussion of the A and B routes. However, DOE has not addressed the above comments. There is no mention, in the discussion of these two routes, what the alternative transportation routes will be in event of an accident or other impediment that may arise on route 93 or route 6. Eureka County could be impacted by the use of the A and B routes. These impacts must be analyzed and mitigation measures identified.
K. Compensation

Comment:
“If the alternate rail route alignment of the Carlin route in Crescent Valley would be used, would my land and home be inside or outside the corridor? If inside: exactly how much, and when
would I be compensated? If my land and home are immediately outside the corridor, would I be compensated in any way or ‘merely’ exposed to disruption, disturbance, discomfort, inconvenience, and health hazards without compensation?” (V.M. Gruening, EIS001241/09)

**DOE Response 8.6.2 (6496):**
DOE has developed a conceptual rail design that identifies candidate corridors ([DIRS](#) 155022-CRWMS M&O 1997). If a rail-implementing alternative was chosen for transport within Nevada, environmental and engineering field studies would be conducted during the rail design phase. These field studies would be used in selecting a final alignment that minimizes, to the extent possible, impacts to stakeholders along the final rail alignment. DOE has included in its cost estimate for rail construction ([DIRS](#) 154822-CRWMS M&O 1998) costs for obtaining right-of-way for each candidate rail corridor. Because a final alignment for any candidate rail corridor would be determined at a later date, it is premature for DOE to specify any dollar amount that would be used to compensate any private stakeholder for land within a final rail alignment right-of-way. DOE does not anticipate compensating stakeholders with land adjacent to any final rail alignment.

**Response to DOE Response:**
Judicious alignment of the rail line within the corridor may “minimize” the impacts on landowners; nevertheless, the taking of large areas of private land cannot be avoided. The impacts from a rail line on land use in Eureka County would be significant. DOE must identify specific mitigation measures at this time and disclose such measures to the public. Landowners, like the above commenter, are entitled to a better understanding of how a rail line would affect their homes and livelihoods. Unfortunately, DOE has avoided any specific discussion of the issue of compensation in its response. Instead, the agency has committed only to conducting essential field studies of land use after a corridor has been selected. This does not qualify as adequate mitigation under NEPA.

**Comment:**
A Eureka County resident whose home is located very near the proposed alternate rail route corridor asked, “If the alternate route would be used… would my land and my home be inside or outside of the corridor? Exactly how, how much and when would I be compensated? If the primary alignment rail corridor through Crescent Valley would be used, would I be compensated at all for my uncomfortable and disturbing proximity to it?” (Jamie Gruening, EIS000632/02)

Another Eureka resident asked, “If we experience a loss of property values as a result of this railroad, will we be compensated for loss of property value?” (Lee Louden, EIS000621/06)

**DOE Response 11.2 (202):**
At present, definitive information is not available on specific tracts of land that could be required for a given transportation alternative. For any taking of property that could be required, the Department would compensate landowners under Federal acquisition procedures. Should DOE be required to exercise its right of eminent domain, it would do so pursuant to applicable laws.
and regulations. Where practicable, DOE would also align corridors and design facilities to minimize the potential for impairment of private property rights.

With regard to decreases in land values in proximity to rail corridors, DOE’s examination of relevant studies and literature concluded that while under some scenarios the perception of risk could result in adverse impacts on portions of a local economy (including property values), there are no reliable methods whereby such impacts could be predicted with any degree of certainty. While possible impacts can be envisioned, they are not inevitable. Any such adverse conditions would likely be an aftereffect of unpredictable future events, such as a serious accident.

The EIS analysis concluded that the potential for risk to public health and safety along any of the alternative transportation routes would be small. Based on the results of the impact analyses 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 also believes, as the EIS reports, that the potential impacts of transportation would be so low for individuals who live and work along the routes that impacts to individuals would not be discernible. The EIS analytical results are supported by numerous technical and scientific studies (see Appendix J of the EIS) that have been compiled through decades of research and development by DOE and other Federal agencies of the United States, including the Nuclear Regulatory Commission and the U.S. Department of Transportation, as well as the International Atomic Energy Agency.

Response to DOE Response:
DOE has deferred specifically addressing any comments on compensation because, “definitive information is not available on specific tracts of land that could be required for a given transportation alternative.” This is an inadequate response to the concerns of Eureka County property owners. “Definitive information” on land use issues must be obtained and disclosed to the public before DOE can make any further transportation-related decisions.

It must also be noted that though judicious alignment of the rail line within the corridor may “minimize the potential for impairment of private property rights,” it will not prevent the taking of large areas of private land nor the loss of property value to lands adjacent to the rail line.

Public perceptions of risk are not necessarily predicated on DOE’s impact analyses. Despite DOE’s assurances of the safety of nuclear waste transportation, the public may remain extremely wary of the risks involved – even without a major accident to reinforce sentiments of fear. It is possible that a rail line could create an economic stigma effect in Eureka County; DOE must provide compensation to mitigate such impacts.

Comment:
“We will be crossing the tracks about six or eight times a day. This is going to greatly impact our lives because we will have to schedule our lives around the train schedule. If it’s even available to us. Will it be?
“We don’t want to be stopped at the crossing waiting for the train to go by because our radiation exposure will go up. We will lose spontaneity in our lives and the freedom to make our decisions for our movement in the valley we live in.

“We use our hot springs to improve our health, and it is hardly compatible with train cars full of deadly waste sitting in Beowawe and going by in full view from our hot water therapy bath.

“This will definitely devalue our property and ruin us financially. Even if DOE did compensate us, would it be enough to relocate at another hot springs? Hot springs are not replaceable. We would be lucky to ever find another one to buy.” (Nancy Louden, EIS000637/03)

DOE Response 11.2 (2720):
While DOE has identified rail as the preferred mode of transportation both nationally and in Nevada, it has not identified a preferred corridor for a branch rail line or the schedule of waste shipments. The Department is considering five candidate rail corridors, but has not selected one as preferred. Minimizing impacts to current land uses, such as the potential impacts identified by the commenter for a branch rail line in the Carlin Corridor, would be a primary consideration in the selection of a corridor and a specific route alignment in that corridor.

DOE would have several options for locating a rail alignment within the Carlin Corridor should that corridor be selected. Specific information on the tracks of land that would be needed to construct a branch rail line and other specific impacts to property owners would not be available until DOE conducted surveys and environmental reviews. Therefore, DOE would not consider route-specific mitigation actions until it selected a corridor and a specific track alignment in the corridor. Assuming that another EIS would be prepared in support of alignment selection, mitigation actions would be evaluated in that document. DOE would mitigate or compensate landholders in compliance with applicable Federal laws and regulations.

Assuming one cask per shipment, there would be about 9 shipments per week (based on 10,725 total rail shipments under the national mostly rail scenario as noted in Section J.1.2.1 of the EIS).

Response to DOE Response:
In the above response, DOE has stated its intent not to consider “route-specific mitigation actions” until both a corridor and an rail line alignment within that corridor have been chosen. However, how can DOE accurately choose between the five corridors without knowing the land use impacts and necessary mitigation measures for each? Eureka County does not believe that DOE, with the current amount of information available, can make an informed decision between the candidate rail corridors. The above-mentioned “surveys and environmental reviews” must be conducted prior to any route designation. In addition, mitigation measure that address questions such as those asked above must also be identified and disclosed at this time.

5. Opposition to the Proposed Action

a. General Opposition

Comment:
A Eureka resident commented, “I suggest that more time is allowed for further studies. Quick fixes are unsuitable to big problems. The adult solution will require better mental attitudes and concerns for us and our children’s future.” (Joseph Carruthers, EIS001155/09)

On the same subject, another commenter stated, “I believe that this money could have been spent in a better way by doing studies to determine how nuclear waste could be treated at the sites [where it is currently located] instead of transporting the high level radioactive waste through Nevada to Yucca Mountain.” (Arlene DePaoli, EIS001801/07)

Another commenter stated, “Why don’t they quit wasting the billions they have wasted on these farces they call tests (that nobody seems to look at anyway) and use the monies to figure [out] how to recycle this stuff. Or just leave it where it is! If that area around a ‘Nuclear Power Plant’ is safe enough for the plant to stand on it surely [it] is safe enough to hold their ‘Waste.’” (Fay Ward, EIS000924/09)

DOE Response 5.5(29):
In the late 1970s, DOE evaluated numerous alternatives to geologic disposal of spent nuclear fuel and high-level radioactive waste and published its findings in October 1980 as part of the Final Environmental Impact Statement on Management of Commercially Generated Radioactive Waste (DIRS 104832-DOE 1980). Among the specific technologies evaluated were deep hole disposal, rock melt disposal, island-based disposal, subseabed disposal, well-injection disposal, and disposal in outer space. DOE considered the benefits, impacts, and costs of these alternatives and concluded in its 1981 Record of Decision (46 FR 26677; May 14, 1981) that the mined geologic disposal alternative should be pursued (see Section 1.3.1 of the EIS).

While the NWPA does not provide for alternatives to geologic disposal, Congress has separately directed DOE to study accelerator transmutation of radioactive waste and to prepare a plan for developing that technology. Congress appropriated $4 million to develop the accelerator transmutation plan, which includes a science-based research program, a description of an operational accelerator transmutation system, and other information specifically requested by Congress. DOE submitted the report, A Roadmap for Developing Accelerator Transmutation of Waste (ATW) Technology (DIRS 110625-DOE 1999), to Congress on November 1, 1999. (DOE has modified Section 9.1.3 of the EIS to include the results of this report.)

In the accelerator transmutation process, long-lived radionuclides could be difficult both to isolate and to transmute. Moreover, even if accelerator transmutation becomes a practical technology, a repository would still be an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain.

In the past, DOE has reprocessed spent nuclear fuel to reclaim various useful materials. Reprocessing produces several waste streams, however, which require their own waste- or resource-management technologies, including disposal of high-level radioactive wastes in a repository. DOE has halted routine spent nuclear fuel reprocessing.

DOE agrees that new technologies for waste management could be developed in the future, but at this point, DOE does not recommend abandonment of current waste management strategies.
The operational plan for the proposed 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 or retrieving the waste. The repository would remain accessible for scientists to continue testing and monitoring. By taking a modular or sequential approach to design and construction, more flexibility would be provided for the future generation of scientists and engineers to continue evaluating repository performance while maintaining the capability to retrieve spent nuclear fuel and high-level waste emplaced in the repository.

Response to DOE Response:
In the long term, the proposed repository at Yucca Mountain provides for little flexibility of the fate of nuclear waste. The above commenters have suggested that the tens of billions of dollars that will be spent on burying the nuclear waste out of sight could in fact be diverted to finding a real solution to the dilemma. However, in the above response DOE has made clear that it has no true intent of seriously pursuing alternatives; the agency has chosen instead to take refuge in the Nuclear Waste Policy Act.

Comment:
In a joint statement expressing concerns about the effects a repository at Yucca Mountain would have on Eureka County – specifically the Crescent Valley and Beowawe area – several residents of the County expressed their opinion that instead of spending so many tax dollars on researching how to develop a repository that ultimately will not solve the problem of nuclear waste for this country, the government should be putting more money into researching alternative ways to neutralize nuclear waste and a means of energy production that will make it unnecessary to ever produce more of this hazardous substance.

In a separate statement, a Eureka County commenter expressed the same concern, stating his belief that “…what is going on with the nuclear power industry is absolutely wrong, and I think in our hearts we all know it’s wrong, and we should phase it out.” (Joseph Carruthers, EIS000623/05)

Speaking of the problem of nuclear waste, yet another Eureka County commenter stated, “I think if we cannot control the things that we have created, then those things should not be created at all. If we value this earth upon which we live as important, then we shouldn’t create these things [that may] destroy it.” (Carrie Dann, EIS000634). The same commenter added later, “There are renewable alternatives to nuclear power, yet the United States has made no commitment to close nuclear power plants and develop other forms of power…Construction of the Yucca Mountain dump will permit the continuing operation of dangerous nuclear power plants, and the continuing production of nuclear waste. This is foolish. If there is not an adequate solution to deal with nuclear waste the first step to take is to stop producing it!” (Carrie Dann, EIS001965/07)

Another commenter gave this statement: “…our best scientific minds are continuing in the same wrong direction of prolonging and proliferating not only bomb making but nuclear waste from energy production.
“But that’s why we’re gathered, all of us. We’re all actively trying to do something for the future because the past has definitely shown us that what we have got in the present is not something we want. Just to give some voice to what is glazed over or glossied up or shown to be a possibility, we must take into consideration all the people of this nation and of this world and all our relations, our personal, our families, our communities, our world. That’s what we’re striving for.”

“Why do we as a society continue producing an uncontainable, life threatening, cancer causing substance? Aren’t there other alternatives for life enhancing energy production, for life precious utilization of these given resources?” (John McGraw, EIS000628/01)

All of these comments are addressed in the following summary response.

DOE Response 13(5):
The United States depends on nuclear power as an energy source to produce electricity. At present, approximately 20 percent of the electricity in the United States is generated by nuclear power. In accordance with the Atomic Energy Act, the Nuclear Regulatory Commission is responsible for licensing, regulating, and overseeing commercial nuclear powerplants, including the generation and interim storage of spent nuclear fuel at the reactor sites. Therefore, the Commission, not DOE, has the authority over the Nation’s nuclear power industry.

The National Energy Policy envisions a comprehensive long-term strategy that uses leading-edge technology to produce an integrated energy, environmental, and economic policy (DIRS 157656-Cheney 2001).

DOE is committed to the development and responsible use of all types of energy, and supports energy education and conservation activities. DOE actively promotes these efforts through its many outreach programs. The DOE Office of Energy Efficiency and Renewable Energy is leading the Nation’s efforts in the study of alternative energy technologies, including geothermal, wind, solar, hydrogen, biomass, and hydropower. For information on the Office’s activities, please visit its web site at http://www.eren.doe.gov or write to U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, 1000 Independence Ave., S.W., Washington, DC, 28585.

Response to DOE Response:
Eureka County has no further comments on DOE response.

Comment:
One Eureka County commenter expressed concern about the risks involved in transporting nuclear waste: “…the most dangerous part of it is in movement of it. So don’t move it. I’m hoping that they will keep it on site for the first hundred years, giving themselves time to take and develop new and better ways of handling the radioactivity problem, and basically find a way of disposing it. At least it will be a little bit safer to handle. And they could take the money that
they are wasting on Yucca Mountain and improve the on site storage facilities, enlarging them as necessary.” (Bruce E. Denning, EIS000647/02)

Another Eureka resident stated, “I feel that all of the nuclear waste should be stored on site as it is. I would like to see it monitored. I would like to see a reasonable no action alternative presented.” (Patti Leppala, EIS000635/03)

Yet another commenter was even more emphatic, “I think the nuclear railway is an atrocity. I think [nuclear waste] should be left on site until it is studied more.” (Lee Louden, EIS0001944/09)

On this subject, one commenter simply stated, “Keep it where it is and where it can be monitored.” (Nancy Louden, EIS001941/09)

Another, “We feel that the nuclear waste should be stored at the facilities where it was produced and not stored in Nev. At Yucca Mt.” (Laura Mae Scott, EIS001242/14)

And finally, “I say, research a safer way to dispose of radioactive material – that does not involve a population across the entire United States. Keep the disposal where the Reactors are located!” (Donna M. Woods, EIS001945/09)

DOE Responded to all of the above comments in the following response.

DOE Response 5.3 (164): excerpts
DOE acknowledges that onsite storage systems, such as spent nuclear fuel storage pools, have been operated for several decades without undue risk to the general public or nuclear powerplant personnel.

While commenters are correct that the present storage sites can continue to store spent nuclear fuel and high-level radioactive waste safely in the short term, the NWPA requires DOE to evaluate the Yucca Mountain site for long-term disposal of these materials and then to proceed with disposal if the site was recommended and approved for development of a repository. Although the NWPA does not direct DOE to examine continuing storage at existing sites, DOE provided the No-Action Alternative in the EIS as a basis for comparison with the Proposed Action. In the event the Yucca Mountain site was not approved, DOE would prepare a report to Congress, as required by the NWPA, with its recommendations for further action to ensure safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for any new legislative authority. Under any future course that would include continued storage, DOE would have an obligation to continue managing DOE spent nuclear fuel and high-level radioactive waste in a manner that protects public health and safety and the environment. The issues and concerns expressed by the commenters represent the range of factors that would be considered in future recommendations, including transportation requirements. However, the course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved for repository development is uncertain.
Chapter 7 of the EIS provides a discussion of the No-Action Alternative and estimates of the potential environmental impacts of continued storage at the generator sites (for example, see Section 7.2.1.7.3 for the expected radiation exposure from continued long-term storage). Chapter 6 of the EIS provides estimates of transportation-related impacts. These assessments include a range of scenarios that include "cooler," or aged spent nuclear fuel. It is true that, as spent nuclear fuel and high-level radioactive waste age, the radioactivity of these materials decreases. However, most of the 72 commercial nuclear facilities could continue to accumulate freshly irradiated spent nuclear fuels for decades into the future. DOE has no authority over the operation of the Nation’s commercial nuclear powerplants. The role the nuclear powerplants will play in the future of the Nation depends on the relicensing of such powerplants by the NRC and future power generation decisions made by each commercial utility. DOE recognizes, as do the commenters, that as nuclear powerplants continue to operate, they will continue to produce spent nuclear fuel.

Congress has directed DOE to study accelerator transmutation of radioactive waste, although such research is not funded by the Nuclear Waste Fund. However, even if transmutation becomes a practical technology, a repository would still be an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain. Therefore, the Department does not recommend abandoning the Nation’s current waste management strategies.

Response to DOE Response:

Although the Nuclear Waste Policy Act requires DOE to evaluate the Yucca Mountain site for disposal of nuclear waste, it does not mandate that the site must be found suitable. The above comments highlight the public’s wariness of both DOE’s willingness to move so quickly on such an uncertain and risky project as well as its strenuous attempts to engineer around Yucca Mountain’s many flaws. The commenters could very well be correct in their suggestion to leave the waste onsite at the nuclear reactors – where it has been and will remain safe for many years to come – while a true solution to the problem is more deliberately formulated and tested.

The No-Action Alternatives provided in the EIS do not reflect a reality that anyone is proposing and are therefore unreasonable. How can DOE, in the EIS process, truly evaluate the viability of the Proposed Action when there is no reasonable alternative scenario with which to compare it?

Comment:
“[I believe the U.S. Department of Energy is not prepared or willing to give the people the potential negative impact this nuclear waste repository and its transporting channels will have. There are no guarantees that this repository is safe.]” (Kim M. Elegado, EIS000184/03)

DOE Response 1.2 (243): excerpts

DOE believes that it has performed site characterization activities, as well as the analyses conducted to support the preparation of this EIS, in an open and honest fashion, consistent with the NWPA and the National Environmental Policy Act. Under no circumstances has DOE manipulated data or assumptions to obtain desired results. The health and safety of potential
repository workers and the public are of paramount importance to DOE. If the repository site was approved, DOE would comply fully with Environmental Protection Agency and Nuclear Regulatory Commission regulations (40 CFR Part 197 and 10 CFR Part 63, respectively) that were developed to protect workers and the public. 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.

Response to DOE Response:
Some members of the public, such as the above commenter, do not feel that DOE has been as transparent about the site characterization process as possible. Many uncertainties remain about the future performance of the repository. Many questions that have been asked by members of the public – about issues such as compensation for loss of property values and mitigation for impacts of the Proposed Action – have not been adequately answered. If DOE is unresponsive to the concerns of the public, many may inevitably continue to question the safety of projects such as this.

Comment:
On the subject of nuclear waste, one commenter stated, “…stop making more of it.” (Nancy Louden, EIS001941/10)

DOE Response 5.5 (183):
DOE and the commercial nuclear industry have long been aware of the issues associated with the disposal of spent nuclear fuel and high-level radioactive waste. There has been a concerted effort to determine the most appropriate means of disposal. The Yucca Mountain site characterization studies and this EIS are a continuation of these efforts.

At present, commercial nuclear powerplants produce approximately 20 percent of the total electric power generated nationwide. The role nuclear powerplants will play in the future of the Nation depends, in part, on the relicensing by the Nuclear Regulatory Commission and future power generation decisions made by each commercial utility, pursuant to Commission regulations. Even if the Nation’s utilities ceased the production of commercial spent nuclear fuel, the waste generated in the past would still require long-term disposition, as directed by the NWPA. If nuclear powerplants continue to operate, they will continue to produce spent nuclear fuel. If the repository became operational and met its volume limitation, the issues of where and how to manage additional spent nuclear fuel would require decisions on the national level.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
“Construction of a nuclear depository in a granite batholith or salt dome would be a much better choice from a geologic point of view.” (James D. Sefton, EIS001434/02)
With the passage of the NWPA, Congress established and defined this Nation’s policy for the disposal of spent nuclear fuel and high-level radioactive waste to be geologic disposal. Under the provisions of the NWPA, Congress also directed DOE to prepare this EIS as information for the possible recommendation to the President to approve the development of the Yucca Mountain site for a geologic repository. Congress’ intent was to implement a permanent Federal solution to the Nation’s problem of accumulated spent nuclear fuel and high-level radioactive waste to avoid passing the problem unaddressed to future generations. As discussed in Section 1.5 of the EIS, the NWPA states that the EIS need not consider alternatives to geologic disposal or any site other than Yucca Mountain for repository development.

In the late 1970s, DOE evaluated numerous alternatives to geologic disposal of spent nuclear fuel and high-level radioactive waste and published its findings in October 1980 as part of the Final Environmental Impact Statement on Management of Commercially Generated Radioactive Waste (DIRS 104832-DOE 1980). Among the specific technologies evaluated were very deep hole disposal, rock melt disposal, island-based disposal, subseabed disposal, well injection disposal, and disposal in outer space. Only deep geologic disposal demonstrated an acceptable combination of benefits and risks.

Under the Nuclear Waste Policy Act of 1982, DOE evaluated several sites in different geologic media for disposal of spent nuclear fuel and high-level radioactive waste. Pursuant to that Act, DOE identified nine candidate sites. The Secretary of Energy nominated five of the nine sites for further consideration and study. In May 1986, DOE issued environmental assessments for each of the five sites. Based on DOE’s recommendations, President Reagan approved three of the five sites as candidate sites for a repository. The three sites were Deaf Smith County, Texas; Hanford, Washington; and Yucca Mountain, Nevada. In 1987, Congress amended the Nuclear Waste Policy Act to designate one of the three candidate sites, Yucca Mountain, as the only site to be studied as a potential location for a repository.

Response to DOE Response:
While the Nuclear Waste Policy Act has not required DOE to consider alternatives to geologic disposal of nuclear waste in its site characterization studies, neither does it specifically prevent it. In order for the evaluation of the Yucca Mountain site to hold real value in NEPA’s Environmental Impact Statement process, the site must be judged in comparison to reasonable, feasible alternatives. Only then could the true merits or flaws of a site be ascertained.

However, in dismissing even the possibility of formulating and studying such alternatives, DOE has left itself little choice but to make the Yucca Mountain site fit the repository criteria. Some members of the public are of the opinion that DOE has resorted to engineering away geologic flaws and changing the suitability criteria into guidelines that fit Yucca Mountain, instead of the other way around. Without the consideration of real alternatives, such as those proposed by the above commenter, DOE has rendered the NEPA process hollow and settled on a “solution” to the nuclear waste problem that may not be the best of all options.
Comment:
“This is a horrendous act of arrogance to think that we can safely store high level nuclear waste for 10,000 years. How long have we even been a country? 250 years? 10,000 years is outrageous. We have to come up with a better solution than this.” (Lance Paul, EIS000633/03)

DOE Response 7.3 (210):
DOE acknowledges that it cannot build a containment system that can provide perfect containment forever. The EIS provides the Department's best estimate of the impacts that could occur when the containment system inevitably degraded. The EIS confirms that the Proposed Action would be likely to result in release of radioactive contamination to the environment after repository closure. However, the EIS also shows that these releases under the Proposed Action would not exceed environmental protection standards (40 CFR Part 197) within the 10,000-year compliance period for the repository, standards specifically enacted to ensure the safety of future generations.

In addition to the 10,000-year compliance period, DOE has evaluated potential impacts for the period of geologic stability at the repository (that is, 1 million years). This evaluation was performed consistent with 40 CFR Part 197 to gain insight into the long-term performance of the repository and thus provide information for the decisionmakers in making both design and licensing decisions. These results show a mean peak dose rate that is much lower than background levels (see Section 5.4.2 for details).

With regard to the potential for manufacturing defects, as part of the waste package performance analysis DOE conducted a comprehensive evaluation of fabrication processes that indicated that, for the current design and with a strong quality assurance program, the Department anticipates a very small number of early failures. The DOE long-term performance model represents the number of early package failures statistically as a probability distribution of between zero and five failures. The results show releases during the first 10,000 years that are more than 100,000 times less than the 40 CFR Part 197 individual protection standard of 15 millirem per year. A strong quality assurance program would ensure proper fabrication, stress relief, and testing of the waste packages before emplacement.

Response to DOE Response:
DOE states in this response that the “Proposed Action would be likely to result in release of radioactive contamination to the environment after repository closure.” While DOE does not anticipate the contamination to exceed the regulatory limits, it is not difficult to understand why the fact of its inevitability leads commenters to have so little confidence in the Yucca Mountain Project. DOE has stated that, based on its studies, the repository is bound to fail to some extent sometime in the future. Some commenters, such as the Eureka County resident quoted above, would like to see a more permanent solution to the nuclear waste problem that has better chances of long-term success.

Comment:
“The purpose, the mission of the Yucca Mountain repository as originally stated was to isolate nuclear waste from the environment, both human and natural, and it’s quite clear from this
document, as I read it, that it’s already been acknowledged that that’s an impossibility. So I
don’t even understand why we’re having this discussion. Because if we cannot isolate the waste,
if it is going to leak, whether we’re talking a hundred or a thousand years, we’re looking at
materials like plutonium that have a dangerous life span of half a million years. As plutonium
breaks down it creates other isotopes which last even longer.” (Jennifer Olaranna Viereck,EIS000622/07)

Another commenter stated, “This waste cannot be contained for two generations, much less two
million years, without leaking into the environment.” (Nancy Louden, EIS000637/01)

DOE Response 7.3 (209):
The goal of geologic disposal is to concentrate and isolate spent nuclear fuel and high-level
radioactive waste in a relatively small area for a very long time. DOE intends to achieve isolation
of the wastes in the proposed repository by using a system of engineered barriers and by locating
the repository in the geologic setting of Yucca Mountain. However, it is always possible to
conceive of circumstances (both manmade and natural) that, given the inherent uncertainties
associated with long-term projections, could result in the release of radioactive materials to the
accessible environment. It is also likely that eventual release of some material is inevitable
because all systems will degrade given sufficient time.

The Environmental Protection Agency standards (40 CFR Part 197) recognize that, with the
current state of technology, it is impossible to provide a reasonable expectation that there would
be no releases over a 10,000-year or longer time frame. Therefore, the Agency has established
public health protection standards that the Agency believes would protect human health and
safety. These standards do not require complete isolation of the wastes over the compliance
period (that is, 10,000 years) or the period of geologic stability (1 million years). The goal of a
performance assessment for Yucca Mountain is to evaluate whether the repository would be
likely to meet these standards and thus provide protection of human safety and the environment.

Response to DOE Response:
The goals of geologic disposal, as put forth in the above response, seem to make inroads less
toward solving the problem of nuclear waste than toward putting the problem out of sight and out
of institutional control for a dangerously long period of time. Members of the public are
understandably wary of the uncertainties and consequences of the Yucca Mountain Project.

b. Opposition to Siting a Repository in Nevada

Comment:
Several members of Eureka County joined together in a statement expressing their attachment to
the natural environment in Eureka County and especially Crescent Valley. They described the
valley’s “…good fishing, hunting, colorful spring flowers, canyons in the mountains, green with
willows and cottonwood trees and streams winding through,” and voiced their concern that this
environment and its small supportive communities could be irrevocably damaged by the siting of
a geologic repository in Nevada. Concerns were also voiced about historical sites in Crescent
Valley, including gravesites and ranches.
Eureka County residents representing the Western Shoshone Defense Project concurred, stating, “With our current understanding of this project, it is our opinion that the Yucca Mountain project will have a profoundly negative impact on the cultural, spiritual, political, and economic survival of the Western Shoshone Nation.” (Carrie Dann, EIS001965/01)

Another commenter spoke on this same subject: “There is too much room for human error in transportation and permanent storage [of nuclear waste] at Yucca Mountain.” (Lee Louden, EIS001944/09)

Another commenter stated, “Time ‘is’ probably running out so the sooner the better. Be prepared when the day comes! If a vote ‘no’ was all that was required my vote would be ‘no,’ but I’m afraid that is not the case.” (Margaret E. Meharg, EIS001265/04)

Yet another asked, “Why should there be more hazardous radiation pushed into our lives?” (Laura Mae Scott, EIS001232/11)

One commenter speaking at a public hearing stated, “The document states clearly there is a material called neptunium that does not even peak its releases for 300,000 years. So if we can’t isolate the material, then why are we shoving it in a hole in the ground and covering it over? Why don’t we keep it above ground where scientists can monitor it. If it is safe enough to transport, isn’t it safe enough to keep in one place? Why can’t we monitor it and be careful about it until we do have a technology that will isolate it and not poison a planet we live on?” (Jennifer Olaranna Viereck, EIS000622/08)

Another commenter stated, “…my message is of course that radiation in Western Shoshone territory and worldwide is not wanted. Did you hear what I said? Radiation in Western Shoshone territory and worldwide is not wanted, has no purpose. Nevada is not a dumping place…and I think this is very important, Nevada has its own rainforest. But it’s been destroyed, and it constantly is being destroyed by a number of economical advances, the mining, the watering, of course mining, the military. These things we need to think about as a people. We’re being selfish because we’re thinking of the immediate. We’re not thinking of the long term here.” (Lois Whitney, EIS000625/01)

In a separate statement, the same comment reiterated these views: “Radiation in Western Shoshone territory and worldwide is not necessary or welcome.” (Lois Whitney, EIS000639/01)

DOE responded to all the above comments, in addition to nearly 600 others on the same subject, in the following single paragraph.

*DOE Response 5.1 (27):*
DOE acknowledges the commenters’ opposition to the Proposed Action, its location in Nevada, and the range of concerns expressed about the safety and wisdom of transportation and repository operational plans. Because of the large number of comments received opposing the repository in general and/or for a range of specific reasons, DOE refers the commenters who
have submitted comments summarized here to the discussion of issues in the introduction to this Comment-Response Document (“An Overview of Key Issues Raised in Comments”) and to other comments and responses related to specific topics that cover the range of topics summarized here (see the Comment-Response Document Table of Contents).

**Response to DOE Response:**
Many widely varied comments were made on this subject and the above statement is an inadequate response. Eureka County residents have voiced deep concern over the possible effects of the proposed rail line and the Yucca Mountain Project in general. DOE should directly address such concerns rather than lumping them into a collective dismissal.

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**Comment:**
One Eureka resident expressed the concern that the federal government should not proceed with the Yucca Mountain project when 75 percent of Nevadans, including the State’s governor and congressional representatives, are opposed to the proposed repository. This commenter felt that the quality of life that Nevadans, especially those in rural areas such as Beowawe and Crescent Valley, would be infringed upon by the Yucca Mountain project. (*Joseph Carruthers*, EIS000623/01)

Another Eureka County resident raised similar issues, stating, “It’s a shame that since the government owns so much of Nevada, it is regarded as a dumping ground and now [DOE] wants a rail line through Crescent Valley to transport nuclear waste. The DOE hasn’t a right to say this group of people are expendable!” (*Roberta M. Damele*, EIS000966/05)

DOE addressed both comments in the following summary comment.

**DOE Response 1.2 (79):**
The disposal of spent nuclear fuel and high-level radioactive waste is a concern for the country as a whole as well as the State of Nevada. Chapter 1 of the EIS explains that 77 sites in 35 states store these radioactive materials and that developing a geologic repository for disposing of the materials and a system for transporting the materials to a repository has become the focus of a national effort.

The Nuclear Waste Policy Act of 1982 established a process for selecting sites for technical study as potential geologic repository locations. In accordance with this process, DOE identified nine candidate sites, the Secretary of Energy nominated five of the nine sites for further consideration and DOE issued environmental assessments for the five sites. DOE recommended three of the five sites, of which Yucca Mountain was one, for study as repository site candidates. In 1987, Congress amended the Nuclear Waste Policy Act of 1982 directing the Secretary of Energy to perform site characterization activities at the Yucca Mountain site, and, if the site is found suitable, make a recommendation to the President on whether to approve the site for development of a repository. Any approval recommendation is required to be accompanied by a final environmental impact statement.
Opposition to the Proposed Action: Native American Issues

If the Secretary of Energy makes an approval recommendation, the President must then decide whether to recommend the site to Congress. If the President recommended the site, the legislature or Governor of the State of Nevada would have 60 days in which to submit a notice of disapproval regarding the site designation. This notice of disapproval would become final unless both houses of Congress, within 90 calendar days of continuous session of Congress following receipt of the notice of disapproval from the State, passed a resolution of siting approval, and such resolution later became law. Nevada citizens, through their democratically elected representatives in Congress and in the State Legislature and Governor’s office, have had and will continue to have opportunities to make their views known.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
One Eureka County resident asked, “If the spent nuclear fuels and high-level radioactive waste [is not] safe to move, then why move it? We do not need other people’s waste put in our state.” (Barbara Dugan, EIS000882/01)

Another commenter stated, “It seems to me that the choice of Yucca Mt. in Nevada, where there are no Interstate Highway Connections or Rail Connections to the site, was made without consideration of the people in Nevada, but because we have a lower population and lower representation in Congress.” (Donna M. Woods, EIS001945/06)

DOE Response 1.1 (101):
Congress made the decision to focus on the Yucca Mountain site as a geologic repository when it amended the Nuclear Waste Policy Act through the passage of the Nuclear Waste Policy Amendments Act of 1987. The Nuclear Waste Policy Act of 1982 provided a process for selecting sites for technical study as potential geologic repository locations. In accordance with this process, DOE identified nine candidate sites, the Secretary of Energy nominated five of the nine sites for further consideration, and DOE issued environmental assessments for the five sites. DOE recommended three of the five sites, of which Yucca Mountain was one, for study as repository site candidates. In 1987, Congress amended the Nuclear Waste Policy Act by directing the Secretary of Energy to perform site characterization activities at the Yucca Mountain site, and, if the site is found suitable, make a recommendation to the President on whether to approve the site for development of a repository.

DOE acknowledges that Nevada has played a major role in the development and testing of nuclear weapons. While Nevada has no nuclear powerplants, the State’s residents benefit from nuclear power in the form of consumer goods manufactured in cities that use electricity generated at nuclear powerplants. In addition, Nevada residents use electricity generated by nuclear powerplants during times of peak electrical demand. DOE recognizes, nonetheless, that many people in Nevada believe that the Federal program to develop a geologic repository has unfairly focused on a candidate site in Nevada.
Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
“There [are] also conflicts with state laws. State of Nevada laws specify quite clearly that the State of Nevada does not accept high level waste. So we’ll be in continuous conflict and litigation over this.” (Jennifer Olaranna Viereck, EIS000622/04)

DOE Response 4.1 (83):
DOE recognizes that the State of Nevada has enacted legislation making it unlawful to discharge any radiological agent or high-level radioactive waste into any waters of the state (Nevada Revised Statutes 445A.575). The State has also made it unlawful for any person or government entity to store high-level radioactive waste in Nevada (Nevada Revised Statutes at 459.910). "High-level radioactive waste" in this context includes irradiated reactor fuel.

In a 1990 lawsuit, a Federal court ruled that laws passed by the State of Nevada that stood "as an obstacle to the accomplishment of the full purposes and objectives of Congress" as expressed in the NWPA were pre-empted and could not be enforced [Nevada v. Watkins, 914 F. 2d 1545 (9th Cir. 1990)]. For this reason, the court held that Nevada’s law regarding the storage of high-level radioactive waste in the State was pre-empted to the extent it prevented DOE from carrying out site characterization activities as required by the NWPA. DOE believes that a legal challenge to the construction and operation of a geologic repository at Yucca Mountain would fail on the same grounds.

With regard to the transportation of radioactive material and high-level radioactive waste, State law requires the Nevada Department of Transportation to develop and enforce a plan for the routing of shipments and to cooperate with the U.S. Department of Transportation to develop plans for interstate routing of shipments (Nevada Revised Statutes 459.125). There does not appear to be any ban on the transportation of nuclear material in the State.

Response to DOE Response:
As stated the above response, DOE does not view past Nevada legislation (such as the above-referenced NRS 445A.575) as an impediment to the Yucca Mountain Project. However, the commenter is correct in noting that litigation over the Proposed Action is likely to be protracted and continuous. The State of Nevada has filed several lawsuits against DOE and other federal agencies regarding the Yucca Mountain Project. Among those waiting to be heard in late 2003 or early 2004 in the U.S. Court of Appeals is the EIS lawsuit, filed against the secretary of energy and the president. This lawsuit challenges DOE’s Final Environmental Impact Statement on the basis that it violates both the National Environmental Policy Act and the Nuclear Waste Policy Act. Another lawsuit filed by the State of Nevada concerns DOE guidelines about Yucca Mountain geologic suitability. A third lawsuit, filed against the Environmental Protection Agency (EPA), contends that the agency also violated the Nuclear Waste Policy Act by failing to set adequate health and safety standards for Yucca Mountain. The State of Nevada, Clark County, and the City of Las Vegas have also filed a lawsuit against the Nuclear Regulatory
Commission (NRC), claiming that the NRC acted illegally in revising regulations that govern the criteria to be used for licensing the repository. Litigation over water rights at Yucca Mountain is also ongoing, as a U.S. District Judge is currently denying DOE’s appeal for permanent water permits pending the outcome of Nevada’s Yucca Mountain lawsuits.

Comment:
“It’s also a felony to contaminate ground water in the State of Nevada. There’s already [proof] and is even mentioned in this document [that there is] serious contamination at the Nevada Test Site already, and no prosecutions are taking place for that. This is clearly something that needs to be addressed.” (Jeniffer Olaranna Viereck, EIS000622/05)

DOE Response 4.1 (2223):
DOE recognizes that the State of Nevada has enacted legislation making it unlawful to discharge any radiological agent or high-level radioactive waste into any waters of the state (Nevada Revised Statutes, Section 475A.575). "High-level radioactive waste" in this context includes irradiated reactor fuel.

With respect to existing contamination at the Nevada Test Site, Chapter 8 of this EIS includes the cumulative impacts of past DOE activities at the Site (nuclear weapons testing, etc.). While DOE recognizes that there could be cumulative environmental impacts, the application of the Nevada state law to the past activities at the Nevada Test Site is outside the scope of this EIS.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

c. Native American Issues

Comment:
On the subject of Native American consultation, one commenter stated, “The DOE has failed to properly conduct Native American consultation with affected Native Americans. Consultation must occur on a government to government basis with the various Tribal Councils. This is set forth in various Federal laws and regulations. The work of the “Consolidated Group of Tribes and Organizations” while important, does not constitute “consultation.” It is our understanding that the members of this group have consistently expressed their opposition to the Yucca Mountain project. Yucca Mountain lies within the territory of the Western Shoshone Nations, yet the northern communities of the Nation have been left out and ignored by the DOE in its evaluation of impacts and cultural concerns. Failure to properly consult with all of the affected tribal interests undermines the NEPA process, and violates Federal law.” (Carrie Dann, EIS001965/11)

DOE Response 3.7 (57):
Section C.2.1.4 of the EIS contains a clear expression of the DOE commitment to consultation with Native American tribal governments likely to be affected by DOE decisions, programs, and
actions. That commitment is consistent with DOE Order 1230.2, "American Indian Tribal Government Policy," which recognizes the unique relationship between the Federal Government and tribal governments. It is also consistent with a variety of laws and regulations, including the American Indian Religious Freedom Act; the Native American Graves Protection and Repatriation Act; Executive Order 13007, Sacred Sites; and the National Historic Preservation Act, all of which elaborate on that same unique relationship (see Chapter 11). DOE has consulted, and will continue to consult, with tribal governments as sovereign entities that possess authority and responsibility for Native American territory. A major objective of these consultations is to ensure that the EIS addresses the full range of Native American cultural and technical concerns related to the Proposed Action. Moreover, in these consultations DOE makes every effort to avoid compromising the interests of individual tribes and, thus, to minimize conflicts between tribes and tribal groups or other local (nontribal) government entities.

Beginning with the Native American Interaction Program in 1987, DOE has consulted with Native Americans on tribal concerns about the Yucca Mountain Project. Native Americans have expressed general concern about the impacts of the candidate rail corridors, heavy-haul truck routes, and intermodal transfer station locations. Consistent with its trust responsibilities, DOE does not intend to take action, make decisions, or implement programs without consulting affected tribal governments. In all cases, project decisions will incorporate input from affected tribes.

DOE prepared the EIS in accordance with Section 2 of the Nuclear Waste Policy Act of 1982, which defines affected Indian Tribes as "...any Indian Tribe—(A) within whose reservation boundaries a monitored retrievable storage facility, test and evaluation facility, or a repository for high-level waste or spent nuclear fuel is proposed to be located; and (B) whose federally defined possessory or usage rights to other lands outside the reservations boundaries arising out of congressionally ratified treaties may be substantially and adversely affected by locating such a facility: Provided that the Secretary of Interior finds, upon the petition of the appropriate government officials of the Tribe that such effects are both substantial and adverse to the tribe." For this EIS, "Native American" means "Indian" or "American Indian."

Response to DOE Response:
Section C.2.1.4 of the EIS actually contains information about the jurisdiction of the National Marine Fisheries Service regarding the Yucca Mountain Project. Preliminary research into the document has failed to yield a “clear expression” of DOE’s commitment to the concerns of the Native American community; however, it is doubtful that this mere expression of commitment is satisfactory to the Native Americans concerned about the repository project. Only actions taken by DOE to can give meaning to its stated commitment, and thus far, DOE’s actions appear to have left the Native American community unsatisfied and playing only a small and easily dismissed role in the process of site characterization and approval.

While DOE has stated above that it does not intend to “take action, make decisions, or implement programs without consulting affected tribal governments,” it has in practice left much doubt in the minds of Native Americans, such as the commenter quoted above, as to its commitment to such consultations. It is crucial for DOE to not only legally perform such consultations to the full extent required by the Native American tribes, but also to take into
account the results of these consultations when making decisions about the Yucca Mountain Project. Unless DOE engages in a more thorough, transparent, and responsive process regarding the consultation of Native American tribes, tribal members may continue to have little confidence in DOE’s handling of the repository project.

Comment:
A Native American resident of Eureka County presented this statement of opposition to the proposed repository:

“We oppose this project based upon the traditional cultural and spiritual teachings of our people, as well as the fact that this particular piece of land lies within our ancestral lands as recognized in the 1863 Treaty of Ruby Valley. Indian people have used this area since time immemorial. Indian nations pre-date the United States and will likely survive the existence of [the] United States. While presently unoccupied by Indian people, this area may be reinhabited in [the] future thus it is a responsibility and necessity to protect this area, its waters, its wildlife, and its cultural areas. Because Indian people are the permanent occupants of these lands they will suffer the greatest long-term risk and exposure. Indian people have already suffered greatly as a result of the U.S. nuclear program. The Navajo uranium miners, the people of Laguna Pueblo, and the downwind Shoshone and Paiute communities are just some of the examples of Indian people who have suffered for this misguided policy. We should not be put at any more risk. If this project is as safe as you claim, there would be no need to build it here far from the sources of nuclear waste. But because you recognize the extreme danger and risk involved in the storage of this waste you choose to ship it far from yourselves, burdening our land and our future generations with it. This is not surprising considering the history of contempt and disregard with which you have treated our lands and people. This is an issue of environmental justice. The executive orders concerning sacred sites and environmental justice are applicable here. While DOE concern about cultural sites is important as is the work of the “Consolidated Group of Tribes and Organizations” to protect and document these areas, in no way does this make development of the dump acceptable to Indian people.” (Carrie Dann, EIS001965/03)

DOE Response 7.5.11.2 (240):
DOE’s proposal to construct and operate a geologic repository at Yucca Mountain for the disposal of commercially generated spent nuclear fuel and high-level radioactive waste is based on the requirements of the NWPA. Congress enacted NWPA to address the problem of disposing of nuclear waste generated by commercial nuclear power plants. Under the Act, DOE is directed to take title to commercial spent nuclear fuel and take responsibility for its ultimate disposition. The Act also establishes a comprehensive process for determining the suitability of Yucca Mountain as a repository and for determining whether a monitored geologic repository should be constructed at the site.

DOE believes that it has appropriately considered Native American viewpoints by incorporating into the EIS the potential impacts to historic and other cultural resources identified by Native Americans as important to sustaining and preserving their cultures.
DOE initiated its Native American Interaction Program in 1987 to consult and interact with tribes and organizations on the characterization of the Yucca Mountain site, and the possible construction and operation of a repository. As part of this program, tribal representatives are named by their respective tribes to sit on a DOE-funded, self-organized committee called the Consolidated Group of Tribes and Organizations. This organization meets twice a year and participates in field trips to Yucca Mountain to impart cultural resource protection information and to become more aware of the studies being conducted. Additionally, specialized Native American subgroups have been periodically convened to interact with DOE on specific tasks including ethnobotany, review of artifact collections, field archaeological site monitoring, and the EIS process. While the Consolidated Group of Tribes and Organizations does not support the use of Yucca Mountain as a repository, it has agreed to be involved in an honest and participatory process.

During preparation of the EIS, DOE interacted with Native American tribes on a range of topics of interest to assess their viewpoints and perspectives. DOE supported the American Indian Writers Subgroup of the Consolidated Group of Tribes and Organizations in its preparation of American Indian Perspectives on the Yucca Mountain Site Characterization Project and the Repository Environmental Impact Statement (DIRS 102043-AIWS 1998) used as a resource in the preparation of the EIS. This document discusses site characterization at Yucca Mountain and the Proposed Action in the context of Native American culture, concerns, and views and beliefs concerning the surrounding region. Section 4.1.13.4 of the EIS presents excerpts from this document to reflect a Native American point of view.

Based on the results of the report and these interactions, DOE acknowledges in the EIS that people from many Native American tribes have used the area proposed for the repository as well as nearby lands; that the lands around the site contain cultural, animal, and plant resources important to those tribes; and that the implementation of the Proposed Action would continue restrictions on access to the repository site environs. Furthermore, the presence of a repository would represent an intrusion into what Native Americans consider an important cultural and spiritual area. Although these viewpoints may suggest that the Yucca Mountain site should not be developed, DOE and the Consolidated Group of Tribes and Organizations recognize that restrictions on public access to the area have been generally beneficial and protective of cultural resources.

Response to DOE Response:
As stated above, DOE believes that it has adequately “considered Native American viewpoints by incorporating into the EIS the potential impacts to historic and other cultural resources identified by Native Americans as important to sustaining and preserving their cultures.” However, despite the impacts to cultural resources identified in the EIS, DOE still designated the Proposed Action as its “preferred alternative.” Native American tribal members may be understandably led to believe that this conclusion only signifies DOE’s lack of regard for the weight of these impacts on the Native American community. Despite the ardently professed importance of these cultural resources to both the past heritage and future survival of the Native American community, DOE has disregarded the impacts these resources may suffer as a result of a repository. Such impacts are apparently not considered meaningful enough to deter the the Yucca Mountain Project from going forward.
A related issue brought up by the commenter but not addressed in DOE’s response, is that of environmental justice. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs each Federal agency “to make achieving environmental justice a part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations (p. 3-112).” As evidenced by the above commenter, members of the Native American community in Nevada, a minority population, feel as though they would be shouldering a disproportionate amount of the adverse environmental impacts of the Proposed Action. Sacred sites, plant and animal life, water, air, geology, the traditional and spiritual integrity of the land surrounding Yucca Mountain, and the holistic interrelation of all these resources could be irrevocably damaged in the course of repository construction and operation.

DOE, however, concludes otherwise. The Final EIS states that there are no identified subsections of the population that “would receive disproportionate impacts, and no unique exposure pathways, sensitivities, or cultural practices that would expose minority or low-income populations to disproportionately high and adverse impacts (p. 4-88).” The Consolidated Group of Tribes and Organizations has expressed to DOE how gravely a repository would irreversibly impact traditional Native American lands and cultural practices. Yet DOE resists the environmental justice implications of such impacts, choosing only to “acknowledge” the concerns of Native American people and “recognize” that it could not undertake disposal of nuclear waste in Yucca Mountain without conflict with the viewpoint of the Native American community (p. 4-90). DOE has failed to identify these cultural impacts as significant; failed to exhibit reasonable understanding of the damaging effects they could have on Native American cultural heritage; and failed to propose any specific, feasible mitigation measures to lessen these impacts should a repository be built.

Comment:
Concern was also expressed over the discussion of the Treaty of Ruby Valley in the Draft EIS:

“Your discussion of the Treaty of Ruby Valley is insufficient and inaccurate. With the signing of the Treaty the U.S. government had entered into a nation to nation agreement with the Western Shoshone nation. As an agreement between nations, it was recognized within the U.S. Constitution as the “supreme law of the land.” Despite the many concessions granted to the U.S. by the Western Shoshone, the Treaty of Ruby Valley is significant because it ceded no land. And like all Treaties it did not grant rights to Indian people, it granted certain privileges and rights to the U.S., reserving all the sovereign rights and responsibilities possessed by the Nation unless specifically waived. It is also important to note that the Supreme Court’s ‘canons of treaty interpretation’ require that Treaties be interpreted as the Indian people understood them at the time of signing, and that any ambiguities be interpreted in favor of the Indian people. The Federal government has chosen to hide behind the fraudulent proceeds of the Indian Claims Commission in denying the continuing validity of our Treaty. By what Constitutional authority do the “findings” of a commission permit the violation of Treaties? The Supreme Court case
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U.S. v. Dann is also mentioned in reference to the Treaty. Title to our land was never litigated by this court. Federal District court has declared the Treaty of Ruby Valley as being in “full force and effect” and this has yet to be refuted by any U.S. court.

“Yucca Mountain is within the boundaries of the Western Shoshone Nation as defined by the Treaty…the Treaty does not permit creation of waste dumps, nor cede title to Western Shoshone lands. The Treaty is the “supreme law of the land.” The U.S. government has already seized enormous amounts of Western Shoshone land (Nellis and NTS), rendering large portions uninhabitable (NTS). Even now the Air Force has requested permanent withdrawal of Nellis lands, Yucca Mountain will be repeating and increasing this injustice to the Western Shoshone.

“The Western Shoshone have clearly expressed their opposition to this project. Western Shoshone National Council has passed a resolution declaring Newe Sogobia a nuclear free zone. The Wells band of Te-Moak Tribe of Western Shoshone has passed a resolution against nuclear waste transport through their community. My family is opposed to Yucca Mountain and efforts to build a nuclear waste train through our traditional use area in Crescent Valley.

“Because of the unwillingness of the U.S. to recognize our rights as indigenous people and U.S. citizens, we have sought international forums to assist us in protecting our lands and interests. You should be aware that the Inter-American Commission on Human Rights is currently investigating the case brought by myself and sister Mary concerning the United States continuing violation of our human rights. Both the Yomba Shoshone Tribe and the Ely Shoshone Tribe have intervened in support of our assertion that the continuing actions of the U.S. government including the pursuit of the Yucca Mountain dump violates our rights. Both Yomba and Ely have also filed similar petitions before the United Nations Committee to Eliminate Racial Discrimination. The unwillingness of the United States and the DOE to respect Western Shoshone concerns is also a clear violation of rights identified in the United Nations Draft Declaration on the Rights of Indigenous Peoples. We are putting you on notice that you will [be] held accountable internationally for your actions on our lands.” (Carrie Dann, EIS001965/04)

A separate statement on this subject was made by another commenter:

“The last point that I want to make as a representative of the defense project is the fact, and this has been mentioned before as well, is the fact around World War II the Atomic Energy Commission and the Department of Defense seized hundreds of thousands of acres of Western Shoshone land, the creation of the Nellis Air Force Range and the Nevada Test Site. This was done without the consent of Western Shoshone people, and access is now denied to those areas. Burial sites have been disturbed, cultural sites have been disturbed, plants, animals and water have all been contaminated to these things.

“And now what we see is the federal government doing exactly the same thing and trying to force a project down the throat of people that don’t want it. The Western Shoshone National Council has declared Western Shoshone territory as a nuclear free zone. But still we proceed forward with this. I want a government that acts with dignity and honor. And this is not the way the federal government is behaving in regards to this project. And I’m ashamed, and you should be ashamed as well.” (Christopher Sewell, EIS000638/06)
“Now…the U.S. Government is under investigation by an international human rights commission, the interAmerican Commission on Human Rights which was established by the Organization of American States to protect and promote human rights by the member states of the Organization of American States, which is essentially a United Nations of the western hemisphere, of which the U.S. Government is part of. And right now this commission is investigating the status of U.S. treatment of Western Shoshone people and the process by which the U.S. has claimed to deprive them of title to their land, and we feel that the DOE should be aware of this process and the fact that the DOE proceeding with these plans for Yucca Mountain and this rail route prejudices this investigation.” (Christopher Sewell, EIS000638/09)

“…I will reaffirm and remind the DOE of the Treaty of Ruby Valley and that treaties are indeed recognized in the Constitution as the supreme law of the land. The only thing we see so far in the EIS regarding the treaty is some references to the Supreme Court case and to an Indian Claims Commission decision. And we would like to reaffirm our position that title has never been litigated to Western Shoshone land. And in fact, a Federal District Court here in Nevada made a ruling which in fact said that the Treaty of Ruby Valley is in full force and effect.

“Another thing – a question that I want on the record. Two questions that I want on the record. First of all, is it the DOE’s position that Western Shoshone land title was litigated by the Indian Claims Commission? Second question I want on the record. Is is the DOE’s position that the Indian Claims Commission proceedings and the Supreme Court has the legal authority to nullify the Treaty of Ruby Valley.” (Christopher Sewell, EIS000638/01)

Another commenter addressed this same subject:

“I also believe that the DEIS does not adequately address a number of legal issues. The first and most important in my view is the issue of the Ruby Valley Treaty. There is very little information in the DEIS about the Ruby Valley Treaty which acknowledged in 1863 that the Western Shoshone have sovereignty over this land. It is in litigation at this present time in international courts, the Organization of American States, and it continues to be litigated in federal courts. All I could find in the summary was one small green paragraph set aside as though it were a point of interest along the highway and not a real issue to be dealt with. So I would ask that that be much more adequately addressed.” (Jennifer Olaranna Viereck, EIS000622/02)

Finally, one last commenter made a similar statement:

“Stop the warfare against the Western Shoshone rain forest. We will be disadvantaged to fight what our senses cannot detect. Remember, there are no assurances of the health and safety and/or compensation on ourselves and our future generations. Should we allow this to exist?” (Lois Whitney, EIS000639/02)

DOE responded to all the above comments in the following statement.
Although the Treaty with the Western Shoshone of 1863 (commonly known as the Treaty of Ruby Valley) was intended to formalize a peaceful relationship between the Western Shoshone people and the Federal Government, this treaty has been the subject of an ongoing controversy over the land claimed as ancestral territory by the Western Shoshone.

DOE, as a Federal agency, must abide by a 1985 U.S. Supreme Court decision that the Western Shoshone claim to land associated with the Ruby Valley Treaty is no longer valid, and that fair compensation has been made. The Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them rights to 97,000 square kilometers (24 million acres) in Nevada, including the Yucca Mountain region. In 1977, the Indian Claims Commission granted a final award to the Western Shoshone people, who dispute the Commission findings and have not accepted the monetary award for the lands in question. In 1985, the U.S. Supreme Court ruled that even though the money has not been distributed, the United States has met its obligations with the Commission’s final award, and, as a consequence, the aboriginal title of the land had been extinguished.

DOE recognizes that Native American people living in areas near Yucca Mountain have concerns about protection of traditional uses and the spiritual integrity of the land that extend to the propriety of the Proposed Action, and that the implementation of the Proposed Action would continue restrictions on access to the site as discussed in Section 4.1.13.4 of the EIS. Furthermore, the presence of a repository would represent an intrusion into what Native Americans consider an important cultural and spiritual area. DOE will continue to consider Native American input regarding the cultural resources and religious values and beliefs of the Yucca Mountain area.

DOE also recognizes that Native American tribal governments have a special and unique legal and political relationship with the Government of the United States, as established by treaty, statute, legal precedent, and the U.S. Constitution. DOE recognizes and commits to a government-to-government relationship with Native American tribal governments. DOE will continue to interact and consult with tribal governments and will work with representatives of the Consolidated Group of Tribes and Organizations to ensure that tribal rights and concerns are considered before taking actions, making decisions or implementing programs that could affect tribes.

With regard to the location of information on Opposing Native American Viewpoints and the content of the Land Use and Ownership section, DOE has attempted to logically organize the material presented in the EIS by environmental discipline. Other information, such as opposing Native American viewpoints, has been placed in its own numbered section because DOE does want to clearly present the viewpoints expressed by Native American groups.

Response to DOE Response:
While it is understandably not the function of the EIS to address the issue of Western Shoshone land rights, nor DOE’s responsibility to question the federal government’s position on the Treaty of Ruby Valley, merely “acknowledging” the issue is unresponsive to the concerns of the Western Shoshone tribal members. The 1863 Treaty of Ruby Valley is of vital importance to the
Western Shoshone Nation, and if DOE as a federal agency is to honor its trust responsibility and fully involve members of this tribe in the Yucca Mountain Project, this issue should not be so lightly dismissed.

**Comment:**
Further comments by the Native American residents of Eureka County include the following:

“In our ways there are four sacred elements, the Earth, the water, fire (the sun), and air. When we look at the Yucca Mountain project with these elements in mind, we see the absurdity of your proposal to store high level nuclear waste at Yucca Mountain. It is a violation of the natural laws as set for by our Creator…Mother Earth is sacred, she should not have poisons injected into her. The earth is alive – earthquakes are a reality and Yucca Mountain is a very geologically active area, it is laced with faults. It is foolish to think that the mountain can contain this waste for thousands of years, water and air both flow through the mountain. The mountain breathes. That is why the DOE now says it will engineer a facility to contain the waste itself. This is even more foolish, we haven’t even been able to write for the amount of time this stuff will be toxic. To suggest we can build a facility that will contain it for that long is ridiculous.” (Carrie Dann, EIS001965/05)

**DOE Response 7.3 (220):**
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 Final EIS is that now there is an aerial pathway release from an eruptive scenario that is analyzed. The dose rates for this scenario are reported in Section 5.7.2 and are well below the 40 CFR Part 197 individual protection standard of 15 millirem per year.

For probabilistic analyses such as that performed to evaluate potential impacts from igneous disruption events in the EIS, a Monte Carlo method was used whereby a number of realizations using different sets of input parameters are added together to give the total probability-weighted dose. For the Final EIS, 5,000 realizations were completed and the results are provided graphically in the Section 5.7.2. The results are presented as a group of curves that display probability-weighted annual dose rates calculated using different sets of statistically sampled values for uncertain input parameters in the model. The range of results shown by these individual curves displays the uncertainty in the calculated dose history resulting from uncertainty in parameter values.

The dose history for the igneous activity scenario in Figure 5-7 of the Final EIS is presented as a probability-weighted annual dose resulting from events occurring at uncertain times throughout the period of simulation. This approach to calculating and displaying the probability-weighted
annual doses is consistent with the approach specified by 40 CFR Part 197 and is required for determination of the overall expected annual dose. However, displays of the probability-weighted annual dose do not allow direct interpretation of the conditional annual dose, which is the annual dose an individual would receive if a volcanic event occurred at a specified time. For conditional analyses, the probability of the event is set equal to one, and the time of the event is specified. Conditional results do not provide a meaningful estimate of the overall risk associated with igneous activity at Yucca Mountain, but they provide insights into the magnitude of possible consequences for specific sets of assumptions. A sensitivity calculation was performed to provide results for this conditional case, and conditional mean annual dose histories were calculated for eruptive events at 100, 500, 1,000, and 5,000 years. The conditional mean dose in the first year after an eruptive event at 100 years after repository closure is approximately 13 rem. The conditional dose in the first year after an eruption decreases to approximately one-half this level for an eruption 500 years after closure, and is approximately 10 percent of this value for an eruption 5,000 years after closure. This calculation was made with a previous TSPA model that has some differences from the model used elsewhere in this EIS for long-term performance. The differences that affect the analysis described above are that dose factors were revised to conform to 40 CFR Part 197 and the distance analyzed is 18 kilometers (11 miles) rather than 20 kilometers (12 miles) from the repository. These changes would be expected to increase the dose values at 100 years and 500 years by a factor of between 2 and 3. The results at the later times would increase by about 20 percent.

As discussed in Section 5.2.3.5 of the Draft EIS, the major effect of an earthquake at Yucca Mountain would be ground motion (shaking) rather than direct offset along a fault. The *Disruptive Events Process Model Report* ([DIRS](#) 151968-CRWMS M&O 2000) discusses the effect of offset along a fault. Past movement has been along existing faults, and the probability of new faults forming is low. DOE would not emplace waste packages near existing faults, so the probability of shearing a waste package would be very low.

The rockfall analysis discussed in the *Waste Package Degradation Process Model Report* ([DIRS](#) 138396-CRWMS M&O 2000) that supports the Total System Performance Assessment ([DIRS](#) 151968-CRWMS M&O 2000) and the Final EIS is much more detailed than that in the Draft EIS. DOE based the analysis of the probability of rocks of various sizes falling and damaging waste packages on the rock properties in the repository. Analyses of this new design ([DIRS](#) 114171-CRWMS M&O 1999), which includes a drip shield, show that the waste package could withstand the largest potential rockfall. Adding strong drip shields above the waste packages provides a very robust design that would be able to withstand any credible rockfall. Therefore, the effects of rockfall are not part of the Total System Performance Assessment calculations for the Final EIS.

The analysis for the million-year period extended the screening of seismic damage to waste packages throughout that time. This was an analytical assumption based on using the best data and models available for the Final EIS. No quantitative analysis was performed to determine when a waste package might degrade to the point where it could be damaged by a seismic event. However, it is reasonable to expect that peak dose estimates would likely have been higher (by an unknown amount) if the analysis accounted for potential seismic damage of degraded waste packages hundreds of thousands of years in the future.
Computer technology is being used to assess the impacts on the environment and human population that would result from seismic and volcanic activity, but not to predict the occurrence and magnitude of these natural events. Computer simulation allows the integration of scientific knowledge about earthquakes and volcanism frequencies, and their effects, together with repository design and other data to predict what damage could result from volcanic events. These are the type of results reported in the Final EIS.

Seismic occurrences around Goldfield, Nevada, are similar to those expected for much of the Yucca Mountain setting and earthquakes of the general magnitude and frequency experienced in the Goldfield vicinity are a part of what analysts have termed the "expected case" for Yucca Mountain for purposes of calculating long-term performance assessment for the proposed repository at Yucca Mountain. The 10,000-year results in the Final EIS were obtained using models that were updated with this new information.

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; the probability of a volcano that could disturb the repository is very low (see EIS Section 3.1.3.1). Nevertheless, DOE presents an analysis of 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. Impacts in White Pine County would be a small fraction of nearby impacts such as those calculated. Sensitivity studies for the Total System Performance Assessment suggest that the probability-adjusted dose from a volcanic, eruptive event at 20 kilometers (12 miles) in the direction of wind transport of an ash plume peaks at a few hundredth of a millirem per year. Therefore, given that White Pine County is considerably farther from the source, doses would be much lower than the very small doses calculated at 20 kilometers.

DOE's analyses also continue to include water pathways in its analyses of health risks of the proposed repository. The people of Amargosa Valley are most at risk because groundwater in the saturated zone beneath Yucca Mountain flows in a generally southerly direction. They use water acquired primarily from local wells for household purposes, agriculture, dairy and catfish farms, horticulture, and animal husbandry.

With respect to comments regarding potential impacts on Death Valley, the DOE acknowledges in Chapter 3 of the EIS that a small amount of groundwater may move beyond the primary groundwater discharge point at Alkali Flat (Franklin Lake Playa) and continue toward Death Valley through the areas of Tecopa and Shoshone. Some of the groundwater in the Amargosa Desert might move through the southeastern end of the Funeral Mountains toward springs in the Furnace Creek area of Death Valley. However, even if this were the case, any impacts on the Furnace Creek area would be even less than the low impacts shown in Chapter 5 of the EIS for the discharge location (Franklin Lake Playa) because the impacts would decline with distance from the repository.
Response to DOE Response:
DOE’s response to this comment only serves to highlight the disconnect between DOE’s professed commitment to honor the concerns of the Native American community, and the lack of seriousness with which it actually addresses these concerns. This Native American commenter has expressed concern over the larger picture, questioning DOE’s proposal in relation to the grand scheme of nature and time and asking DOE to grasp the true implications of its actions. Yet DOE has responded by merely outlining the minute, esoteric calculations of probability and risk with which it purports to be able to predict the future. DOE has not included in its analysis the extent of the disruption to the holistic interrelation of all the impacted aspects of the greater ecology, nor the potential damage to the traditional and spiritual vitality of the land.

Comment:
“According to the DEIS, approximately 826 archaeological sites have been discovered in the analyzed land withdrawal area. (DEIS at 3-66). While none of these sites have been nominated to the National Register, at least 150 are potentially eligible. (Id.). The DEIS goes on to state that "DOE (1988b) describes how the Department meets its responsibilities under Section 106 of the National Historic Preservation Act and the American Indian Religious Freedom Act..." (Id.). Now, is it safe to assume that DOE’s responsibilities under current legislation remain unchanged, or have these too been abrogated? Given the bastardized version of NEPA [National Environmental Policy Act] currently being applied to this project, is it still safe to assume that other relevant legislation remains intact?” (Carrie Dann, EIS001965/14)

DOE Response 7.5.5 (10651):
DOE responsibilities for compliance with the National Historic Preservation Act and the American Indian Religious Freedom Act have not changed (see Chapter 11 of the EIS).

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
“We wish to remind the DOE of the three main federal statutes, and implementing regulations, that establish the framework for historic preservation and cultural resource management in Indian country and in areas currently outside of tribal jurisdiction where tribes have religious and cultural interests. The National Historic Preservation Act (NHPA) (16 U.S.C. 470-470w-6), the Archaeological Resources Protection Act (ARPA) (16 U.S.C. 470aa-470ll), and the Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. 3001-3013) may all play a role in the decision-making process. Additionally, DOE must also keep in mind, the various Executive Orders and policy pronouncements concerning tribal-federal interactions.

“From the information contained in the DEIS, we urge the DOE to immediately seek eligibility determinations for the 150 sites "potentially eligible for nomination" (DEIS at 3-66). We also urge the DOE to reanalyze the "826 archaeological sites" that have been discovered (Id.). During
this process, DOE must remain mindful of the guidance provided in Bulletin 38 published by the National Park Service in 1990. Additionally, DOE must strictly adhere to good faith compliance with section 106 of the NHPA by following the Advisory Council’s regulations. These regulations set out the requirements for consultation with Indian tribes and Native Hawaiian organizations, inter alia, undertakings that would affect tribes by affecting traditional cultural properties that are not located within artificial reservation boundaries.

“Further, we demand the Department to conduct additional surveys of all lands within the proposed withdrawal. Given the evolving nature of NHPA compliance, we believe that many prior surveys may be tainted by the prejudices and past practices of various federal, state, and local entities. In order to purge these past efforts, as well as to fully and in good faith comply with the requirements of the NHPA, we feel a great deal of work has yet to be done. We remind the DOE to vigilantly adhere to its obligations as articulated in the statutes, policy pronouncements, and case law of this nation. Anything less than full compliance will certainly result in violations of both legal and moral norms. (Carrie Dann, EIS001965/15)

**DOE Response 7.5.5 (10652):**
DOE is fully committed to complying with the cultural resource statutes and regulations that apply to the Yucca Mountain Repository (see Section 11.2.5 of the EIS). All previous cultural resource field surveys have been conducted in a legal and professional manner in accordance with 36 CFR 800.4 and the Guidelines for Federal Agency Responsibilities under Section 110 of the National Historic Preservation Act (53 FR 4727). Interactions with the involved Native American tribes and organizations, in accordance with applicable legislation, regulations, and Executive Orders, as well as DOE Native American Policy, is conducted on an ongoing basis through the Yucca Mountain Site Characterization Project Native American Interaction Program (see Section 3.1.6.2.1 of the EIS).

The status of eligibility for the National Register of Historic Places for previously recorded archaeological sites in the Yucca Mountain area is handled on a case-by-case basis, depending on each site’s relationship to project-driven activities. For purposes of the EIS analysis, development of the repository surface facilities would not directly impact any known archaeological properties, regardless of their National Register status (see Section 4.1.5.2 of the EIS).

**Response to DOE Response:**
DOE’s response seems to effectively serve as a denial to the requests of the commenter. Many historical and cultural sites that are of importance to the Native American community can be found in the vicinity of Yucca Mountain. DOE should recognize the significance of these sites and heed the requests of Native American people to reanalyze these sites and pursue nominations to the National Register of Historic Places where appropriate.

**Comment:**
“You know those animals that come from near Yucca Mountain, near the Nevada Test Site, those are animals we [Western Shoshone] eat. I mean, they might sound repugnant to you, but
we eat squirrels and deer and gophers, and way back when we might have eaten snakes and whatever. But those are animals that do not know the boundaries of the little easement that you are going to put alongside the railroad. Those are animals that we’re going to consume. And no one has put a study together to tell us about the long risk that we are going to have to take when we consume those animals. Those animals are part of our heritage. And no one has bothered to study what is happening to us because of our traditional foods.”

(Bernice Lalo, EIS000640/01)

DOE Response 7.5.7 (1707):
During the period of construction, operation and monitoring, and closure at the proposed Yucca Mountain Repository, the only radionuclides that expected to be released would be naturally occurring radon and radon decay products, and noble gases. Of these, only radon decay products have the potential to accumulate in the environment in the edible portions of animals that might live in the land withdrawal area. The consumption of meat accounts for about 5 percent of the dose from radon and radon decay products [using the dose screening factors described in Section G.2 of the EIS (see DIRS 101882-NCRP 1996)], assuming that the animals are at the same location as the person being exposed. If these animals roamed in the land withdrawal area closer to the repository, the concentration in meat could increase by as much as a factor of 5. The overall dose to a person living at the land withdrawal boundary could increase by about 20 percent. For the year of highest exposure this would represent an increase in dose from 1.3 millirem per year to about 1.6 millirem per year. No adverse radiation-related health impacts would be likely at these levels of exposure. DOE based this estimated increase on the consumption of 100 kilograms (220 pounds) of meat per year and the assumption that the radionuclide uptake in wild animals can be represented by domestic animal uptake.

In addition, the updated performance analysis of the flexible design presented in the Final EIS projects that the Proposed Action would likely result in extremely small releases of radioactive contamination to the environment in the first 10,000 years after repository closure. These releases are estimated to result in an annual dose to the reasonably maximally exposed individual of less than 0.0001 millirem (see Section 5.4.2 of the EIS), which is more than 100,000 times less than the individual protection standard of 15 millirem per year set by the Environmental Protection Agency at 40 CFR Part 197. These dose estimates considered the food consumption habits of the potentially exposed population in Amargosa Valley including those of the Native Americans.

Response to DOE Response:
While DOE believes it can reasonably estimate the safety of food consumption for the first 10,000 years after repository closure, the period of time following the initial 10,000 years – when the largest releases of radioactivity into the environment will occur – remains unanalyzed. The above commenter may be correct in indicating that over the very long term, a segment of the food chain could be disrupted by the radiation released from a repository.

Comment:
“In this cultural concept, when you’re taking this down to Yucca Mountain, the transportation, we are talking about genocide. And we [Western Shoshone] have long been participants in this.
So I wanted you to know that. And the radiation that comes from this transportation, we will be the long-term participants in that, and the people that live here will be also. But the animals that live there will bring it back to us, and we’ll have double jeopardy because that’s part of our traditional foods.” (Bernice Lalo, EIS000640/02)

**DOE Response 7.5.11.2 (1708):**
The public health effects from incident-free (routine) transportation of radioactive materials is dependent on four factors: the radiation rate at the surface of the cask, the distance from the passing cask to the individual, the duration of each exposure, and the number of shipments which pass by the individual. None of these factors vary from individual-to-individual within segments of the general population, and therefore the public effects of transporting radioactive materials would be the same for the Western Shoshone as it would be for individuals in any other segment of the general population. Further, because the dose received by any individual would be so low, the potential impacts on any subset of the general population (e.g., the Western Shoshone) would not be high and adverse. DOE has also evaluated additional unique pathways for exposure such as consuming game that had roamed across the withdrawal area and concluded that no high and adverse health impacts would be likely.

**Response to DOE Response:**
Eureka County has no further comments on DOE’s response.

**Comment:**
“Our position is that we feel from the information we have now that this project as proposed and the transportation will have a profoundly negative impact on the political, economic, cultural, social, and spiritual survival of the Western Shoshone nation.” (Christopher Sewell, EIS000638/07)

**DOE Response 7.5.11.2 (2340):**
DOE will continue to document Native American issues and concerns through the Native American Interaction Program that concentrates on the protection of cultural resources at Yucca Mountain and promotes a government-to-government relationship with tribes and organizations. That program has documented Native American information on the proposed repository site since the late 1980s. The Consolidated Group of Tribes and Organizations consists of officially appointed tribal representatives from 17 tribes and organizations who are responsible for presenting their respective tribal concerns and perspectives to the Department. Once modes and locations of transportation activities were identified, additional cultural surveys and interactions with Native American tribes along routes would be conducted.

The program is designed to achieve and maintain compliance with public health and safety and environmental regulations. DOE also has an active relationship with Federal, state, and local regulatory officials to ensure the appropriate regulatory permits and approvals are in place for project activities.

**Response to DOE Response:**
DOE reiterates in this response its commitment to consulting with the Native American community as it proceeds with the Yucca Mountain Project. However, to the above commenter as well as many other concerned Native Americans, merely “documenting” the concerns raised in these consultations is inadequate. Given DOE’s decision to proceed with the repository project, questions arise as to how seriously the agency took into account the profound impacts the Proposed Action could have on Native Americans. DOE must give due consideration to the possible spiritual and cultural threats this project poses to the Western Shoshone Nation; mere “documentation” of these effects alone is dismissive to the significant impact they may have on the heritage and future of the Native American community.

Comment:
“There is a proposal for withdrawing 230 square miles for the Yucca Mountain repository, additional to the lands that have already been withdrawn that are bigger than the size of the state of Rhode Island for the Nevada Test Site itself. And as pointed out earlier, there are many, many issues of impacts on plants that are used for medicines and foods, animals that are hunted and used in other ways in the community, things that are used for building, such as willow and that kind of thing, and they seem extremely inadequate. So I would ask that these things be addressed.” (Jennifer Olaranna Viereck, EIS00622/07)

DOE Response 7.5.4 (11780):
Section 4.1.4.2 of the EIS describes the impacts to plants and animals, which would be largely limited to destruction of vegetation and habitat on approximately 3 to 7 square kilometers (about 800 to 1,700 acres) of land within a very large area of similar, undisturbed habitat. None of the plants and animals found at Yucca Mountain are rare or are restricted to that site, so those resources used for medicines, foods, and other uses still would be widely available at other, more accessible locations.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
“It’s insufficient, there is insufficient dollars that have been designated for native people in the event it affects us.” (Lois Whitney, EIS000625/03)

DOE Response 7.5.11 (11870):
The NWPA recognizes the role of tribal governments. Section 180(c) of the Act requires the Secretary of Energy to provide technical and financial assistance and funds to states and Native American tribes for training public safety officials of appropriate units of local government and tribes through whose jurisdictions DOE would transport spent nuclear fuel or high-level radioactive waste. The training must cover procedures for safe transport and for dealing with
emergency response situations. DOE will fully implement this and all provisions of the Act. Section M.8 of the EIS discusses Section 180(c) requirements in detail.

Necessary and adequate funding for emergency response and for accidents that resulted in a release, if they occurred, would be a visible and closely tracked part of the operational budget of a repository system. The Price-Anderson Act provides liability coverage for commercial activities operating under a license from the Nuclear Regulatory Commission and for DOE activities by establishing a system of private insurance and Federal indemnification that generally ensures that as much as $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 came from 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 Act system. State and local governments cannot be required to provide additional compensation. Price-Anderson Act indemnification would apply to the operators of a nuclear waste repository at Yucca Mountain and to transporters of nuclear waste from commercial nuclear utilities and DOE sites to the repository. Section M.6 discussed liability in greater detail.

Response to DOE Response:
DOE’s response to this comment is appreciated. However, the extent of the training and exact amounts of funding that will be provided to tribal governments – or any affected unit of government – for emergency response has yet to be disclosed.

Regarding compensation under the Price-Anderson Act, it must also be noted that the act provides no liability protection or compensation whatsoever unless an incident causes a release of radioactivity or an authorized evacuation. If a release of radioactivity does occur, the best chances for an affected member of the public to actually recover damages through Price-Anderson appear to be associated with only the most severe of accidents. One would have to sue to recover damages, which would require attorneys and expert witnesses. The litigation process necessary to win compensation could be protracted, except in cases where a settlement with DOE is reached.

In the event of a nuclear incident in Eureka County, some residents could suffer latent, rather than immediate, effects of radiation exposure. In the case of latent effects, an expert witness in a personal injury case, arguing that the defendant’s cancer was caused by radiation exposure, faces a difficult task. It could be extremely difficult, if not impossible, to prove causation.

Additionally, despite Price-Anderson’s broad coverage, it excludes from coverage shipments from an independent fuel storage installation, and transportation accidents where material is stolen and later released (Ziegler, 2003).

Comment:
“Transportation of dangerous nuclear waste exposes large segments of the U.S. population to the potential of accidents and radiation exposure, this includes Indian populations. Current transport options pass through or are adjacent to the following Indian communities in Nevada (Wells,
Elko, Battle Mountain, Crescent Valley, Winnemucca, Lovelock, Pyramid Lake, Reno-Sparks, Ely, and Moapa). The nuclear industry is hypocritical. People living near nuclear power plants have always been told that it is perfectly safe and contained on site, yet now they say it needs to be moved out west for safety reasons. Moving such large volumes of waste around the country increases dramatically the chance for accidents. Construction of new rail routes can open up [the] possibility of increased development in remote areas, with additional impacts to Western Shoshone interests (land, water, cultural sites, hunting and gathering).

“The DOE has stated that they will use the Yucca Mountain EIS to make their decision on the mode of transport for the waste, however all the specific details of how the waste would be transported are still up in the air, the casks have not even been built yet, they don’t know the details of how it would be transported by train, whether private entities would be contracted for the shipping etc. All of these issues are dealt with in a cursory fashion with many assumptions being made. Risk of transport depends on details of cask and rail line construction, operation and route design, yet these details are being put off to a later date. With all these assumptions it is impossible to conduct a reliable analysis of the impacts of this project, yet they inted to make a decision based on this info. Madness! The failure to fully address transportation issues in this document results in segmentation which is forbidden in NEPA. Transport is directly related to the Yucca Mountain project, there is no way to get it there without transportation, and transportation to Yucca Mountain would not occur if the dump were not built.” (Carrie Dann, EIS001965/09)

DOE Response 8.3 (201):
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. At this time, 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 EIS).

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.

**Response to DOE Response:**
Since DOE responded to a total of 51 comments in the above statement, the issues raised by the above commenter were not specifically addressed. The response completely ignores the questions regarding the affected Native American community, among others.

The commenter has expressed concern over DOE’s methods of assessing impacts. Instead of identifying and analyzing specific impacts of a particular action, DOE has instead analyzed a number of scenarios that represent “a reasonable range” of potential environmental impacts. This bounding of analysis only exacerbates the over-generalization of impacts to which the commenter refers; unfortunately, DOE’s above response serves only to reaffirm the agency’s commitment to this kind of non-specific impact assessment.

The “proposed operational protocols” for nuclear waste shipments referred to in the above response only serve to further highlight the problems identified by the commenter. The true impacts of nuclear waste transportation cannot be known until the specific details of how such a transportation campaign would be run are developed. Proposed or suggested operating criteria are an insufficient base from which to analyze the impacts of nuclear waste transportation, much less make mode and route determinations. As the commenter stated, too many assumptions are
being made to accurately assess the risks involved. DOE should determine the specific operating
details involved in transportation and assess the specific impacts that will result from those
operations.

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Comment:
“Initially, the DEIS seems to take what it characterizes as ‘Native American Viewpoints’ and
separate this out from its interpretation of what it means to address environmental injustice in
minority communities. This appears to be the result of the DOE’s misunderstanding of the
significance of the cultural and environmental impacts occasioned by the decision to place a
repository in Yucca Mountain. The Western Shoshone will be more profoundly impacted, both
culturally and environmentally, by the decision to create a repository at Yucca Mountain, than
perhaps any other minority group in the nation. In examining these impacts, the DOE has
responsibilities not only under Executive Order 12898, but also, under the federal government’s
trust responsibility, as well as the various policy pronouncements concerning sacred sites and
government to government relations.

“According to the DEIS, ‘no disproportionately high and adverse impacts would result from the
Proposed Action.’ (DEIS at 4-84). This is perhaps the most outrageous statement contained in
the draft document. It reflects either complete ignorance with respect to the concept of
environmental justice, or a complete lack of respect for the cultural ties of the Western
Shoshone. As stated earlier, these are Western Shoshone lands. Their destruction strikes at the
very heart of the cultural integrity of the Western Shoshone Nation.

“We emphatically implore the DOE to reevaluate issues of environmental injustice with respect
to the Western Shoshone Nation. This reevaluation needs to be done with an attitude of respect
for the cultural and environmental bonds of the Western Shoshone. As currently drafted, the
DEIS fails to adequately take cultural and environmental impacts into account as related to the
issue of environmental justice. We urge the DOE to perhaps seek further guidance as to its
responsibilities to the Western Shoshone with respect to Yucca Mountain and the surrounding
lands.” (Carrie Dann, EIS001965/17)

DOE Response:
This comment does not appear to have been addressed in DOE’s Comment-Response Document.

6. Legal and Policy Issues

a. Site Suitability Guidelines

Comment:
The following is a letter sent by Joseph Carruthers, a Eureka County resident, to DOE in March
of 2000:
This letter is in opposition to your intent to change the guidelines for the suitability of Yucca Mountain as a nuclear waste repository. The guidelines already established that are based on the Nuclear Waste Policy Act of 1982 should be retained because:

1. You are attempting to change the rules late in the process apparently because Yucca Mountain would not be able to meet the original standards.
2. You employ an averaging concept in the newly proposed guidelines which minimizes disqualifying factors. Disqualifying factors must remain clearly defined in a project of this gravity with such extensive potential for negative results.
3. You intend to eliminate consideration of transportation, socioeconomic and environmental impacts from the guidelines, relying upon the DEIS which is seriously flawed. Environmental, transportation and socioeconomic factors must be covered thoroughly in the guidelines as a tool to direct the Secretary to certain essential elements when considering site suitability.
4. The release of the guidelines coincident with the review period for the DEIS created confusion and suggests that you intended to divide the public’s energies, to minimize public scrutiny. The public should be allowed full participation and instead you have effectively discouraged it, thereby violating the spirit and the language of the NWPA.

The proposed amendment to the general site guidelines and the proposed new guidelines should be withdrawn. (Joseph Carruthers, EIS002072/01)

In a separate statement, one commenter asked, “Why has DOE changed the existing regulation guidelines which set subsystem requirements such as groundwater travel time limit? Why do the new guidelines have no specific disqualifiers?” (Karon M. Hollander, EIS001103/09)

On the same subject, another commenter stated, “It’s been shown that Yucca Mtn. is unfit for this use because the ground is unsteady, but that does not seem to matter – just change the qualifications a little. The people of Nevada don’t want it – but that’s alright as nobody else does either, we’ll get it anyway.” (Fay Ward, EIS000924/08)

DOE addressed all the above comments in the following response.

**DOE Response 1.2 (77):**
DOE has not proposed to amend its general guidelines (10 CFR Part 960) to avoid the elimination of the Yucca Mountain site from consideration. Rather, the purpose of the new Yucca Mountain-specific guidelines (10 CFR Part 963) is to implement the NWPA, given the regulations and criteria of the Environmental Protection Agency (40 CFR 197) and the Nuclear Regulatory Commission (10 CFR 63), and to provide a technical basis to assess the ability (or performance) of a geologic repository at Yucca Mountain to isolate spent nuclear fuel and high-level radioactive waste from the environment.

The Nuclear Waste Policy Act of 1982 [Section 112(a)] directed the Secretary of Energy (and by extension, DOE) to issue general guidelines for the recommendation of sites for characterization, in consultation with certain Federal agencies and interested Governors, and with the concurrence of the NRC. These guidelines (issued in 1984 at 10 CFR Part 960) were to include factors related
to the comparative advantages among candidate sites located in various geologic media, and other considerations such as the proximity to storage locations of spent nuclear fuel and high-level radioactive waste, and population density and distribution.

In 1987, amendments to the Nuclear Waste Policy Act specified Yucca Mountain as the only site DOE was to characterize. For this reason, DOE proposed in 1996 to clarify and focus its 10 CFR Part 960 guidelines to apply only to the Yucca Mountain site (to be codified at 10 CFR Part 963), but never issued these guidelines as final. In 1999, DOE proposed further revisions to the draft Part 963 guidelines for three primary reasons:

1. To address comments that criticized the omission of essential details of the criteria and methodology for evaluating the suitability of the Yucca Mountain site.

2. To update the criteria and methodology for assessing site suitability based on the most current technical and scientific understanding of the performance of a potential repository, as reflected in the DOE report, *Viability Assessment of a Repository at Yucca Mountain* (DIRS 101779-DOE 1998).

3. To be consistent with the then-proposed site-specific licensing criteria for the Yucca Mountain site issued by the NRC (the Commission has since promulgated these criteria at 10 CFR Part 63), and the then-proposed site-specific radiation protection standards issued by the Environmental Protection Agency (EPA has since promulgated these standards at 40 CFR Part 197).

In 2001, DOE promulgated its final 10 CFR Part 963 guidelines to establish the methods and criteria for determining the suitability of the Yucca Mountain site for the location of a geologic repository. These final guidelines are principally the same as those proposed in 1999.

With respect to disqualifying conditions at Yucca Mountain, the 1984 DOE general guidelines (10 CFR Part 960) include explicit disqualifiers to guide the Department’s assessment of multiple sites under consideration for repository development. At that time, failure to meet the qualifying condition of any guideline was a basis for removing a site from further consideration. The current standards do not contain explicit disqualifiers, but failure to meet the Environmental Radiation Protection Standards set by the Environmental Protection Agency (40 CFR Part 197) would disqualify the site, as would failure to meet the Nuclear Regulatory Commission requirements of 10 CFR Part 63.

**Response to DOE Response:**

DOE has stated above that the disqualifiers eliminated from the revised guidelines were only necessary when multiple sites for a repository were under consideration. Yet even in the absence of other sites from which to select, how can the site characterization of Yucca Mountain be a meaningful process if there are no stringent thresholds of suitability – developed independently from any knowledge of the site itself – that Yucca Mountain must reach in order to qualify as a repository? “Explicit disqualifiers,” such as those eliminated from the revised guidelines, are a necessary baseline from which to evaluate the suitability of any site. If the guidelines stipulate
that no explicit factors could disqualify a site, then in reality there is no need to evaluate a site for suitability at all. The decision, in effect, has already been made.

In addition to rendering the site characterization process meaningless, the revised guidelines also violate the Nuclear Waste Policy Act. The NWPA expressly mandates that geologic considerations be the “primary criteria” for the selection of the repository site. DOE’s original guidelines reflected this mandate. However, with the revisions in 1999, DOE rewrote the suitability guidelines to rely primarily on engineered waste packages, not on geologic disposal. Instead of finding Yucca Mountain unsuitable for a repository, DOE instead changed the rules of suitability by rewriting their guidelines.

Legitimate suitability guidelines must be developed independently of the site itself. The revised guidelines, as well as the standards set by the NRC and EPA, were developed around the known weaknesses of the Yucca Mountain site. These regulations cannot, therefore, be viewed as reliable and independent standards by which the suitability, performance, and safety of a Yucca Mountain repository can be measured.

b. National Environmental Policy Act (NEPA)

Comment:
“The NEPA, National Environmental Policy Act, is intended, I have read in its documentation, to help public officials make decisions that among other things act to protect, restore and enhance the environment, including the human environment. If the Draft EIS and the whole EIS process and the ultimate recommendations and decisions are obligated by NEPA to function in such a manner, I have the following questions:

1. How, in what specific ways would the storage of nuclear waste protect, restore, or enhance the site at the Yucca Mountain repository?
2. How, again in what specific ways, would the transporting of nuclear waste enhance the environment, including the natural environment and the human environment along the transportation routes themselves? Especially along those routes that at this time have no rail lines whatsoever, such as the proposed Carline route through Crescent Valley.
3. How and in what specific ways would the construction of a rail line, the location of that rail line, and the transporting of nuclear waste on this track enhance the natural environment and the human environment of Crescent Valley…? (Jamie Gruening, EIS000632/03, V.M. Gruening EIS001241/11)

DOE responded to the above comment in two separate responses:

DOE Response 3.2 (75):
The National Environmental Policy Act seeks to promote an understanding of the environmental consequences of Federal actions before agencies take action. The statute does not prohibit activities that could harm the environment; rather, it requires Federal agencies to disclose the extent of such environmental harm, and any environmental benefits, to the public and to agency decisionmakers. DOE believes that this EIS adequately describes the type and magnitude of
potential environmental impacts that could occur if it constructed, operated and monitored, and eventually closed a repository at the Yucca Mountain site.

The Secretary of Energy will determine whether to recommend to the President approval of the Yucca Mountain site for development of a repository. As discussed in Section 2.6, this recommendation would be made, in part, in consideration of potential environmental impacts identified in this EIS and of the factors and comments provided through public input on the Draft EIS and the Supplement to the Draft EIS. If the Secretary made such a recommendation, and in accordance with the NWPA, the President would determine whether to recommend the site to Congress. If the site was approved, the Nuclear Regulatory Commission would decide, on the basis of a License Application prepared by DOE, whether and under what conditions the Department could dispose of nuclear waste in a manner that protects public health and safety and the environment.

**DOE Response 3.10 (6503):**
When Congress proposed a geologic repository in the Nuclear Waste Policy Act of 1982, it clearly intended to address nationwide environmental issues associated with spent nuclear fuel and high-level radioactive waste. These long-lived highly radioactive materials are currently stored at 77 facilities around the country.

Congress directed DOE to evaluate the suitability of the Yucca Mountain site for a repository and, if appropriate, to prepare both a recommendation to the President on the site and an EIS to accompany the site recommendation. DOE’s responsibility is to study and report on the potential consequences for areas that could be affected by the proposal (including areas mentioned in the comment) so that the public will be informed and decisionmakers would have this environmental information available when making determinations on the proposal.

**Response to DOE Response:**
DOE is correct in stating that NEPA does not prohibit activities that could harm the environment. The environmental impact statement process is a tool with which to analyze the harmful environmental effects of an action taken by a federal agency and weigh these impacts against the alternatives. The above commenters, who as members of the public have a role in the EIS decisionmaking process, believe that the damage the Proposed Action will do to the environment of Yucca Mountain may be significant, and possibly greater than the damage caused by leaving the nuclear waste onsite where it is currently stored. However, these Eureka County residents were never given the opportunity to comment on the findings of the Final EIS. The Secretary of Energy recommended the repository site to the president without first allowing the public the 30-day review period mandated by NEPA.

**Comment:**
“I think we need to really look at the National Environmental Policy Act which specifies clearly that it’s to be used to look at whether something will protect or enhance the environment and not to justify a decision that’s already in process or being made. There has been no other site looked at or no other method to isolate the waste that we’re talking about. And it seems to be a political
decision. I think this is illegal, and I think it needs to be addressed a lot more clearly.” (Jennifer Olaranna Viereck, EIS000622/06)

**DOE Response 3.2 (2224):**
The purpose of the National Environmental Policy Act (NEPA) is to promote an understanding of the environmental consequences of Federal actions prior to their implementation. The Act provides Federal agency decisionmakers with a process to consider potential environmental consequences (beneficial and adverse) of proposed actions. In general, the regulations of the Council on Environmental Quality implementing the procedural provisions of NEPA require that an agency examine the reasonable alternatives to the Proposed Action. However, in 1987, Congress amended the Nuclear Waste Policy Act of 1982 and specified that it is not necessary for this EIS to consider the need for a repository, alternatives to geologic disposal, or alternative sites to Yucca Mountain. Section 1.5 of the EIS describes the environmental impact analysis process and its application to the proposed repository at Yucca Mountain.

**Response to DOE Response:**
Despite the implications of the Nuclear Waste Policy Act, one of the most important and meaningful aspects of the NEPA process is the evaluation of alternatives. Without reasonable alternatives to which to compare a Proposed Action, no perspective on the implications of an action can be truly ascertained. The relative benefits of an action cannot be known without an analysis of its alternatives. Regardless of the NWPA, DOE cannot omit this part of the NEPA process and still expect the public to view the resulting EIS as legitimate. The above commenter is one of many voices questioning the designation of the proposed Yucca Mountain repository as the “preferred action,” when no other options have been reasonably explored or analyzed.

c. Nuclear Waste Policy Act (NWPA)

**Comment:**
One Eureka County resident gave this statement on the Nuclear Waste Policy Act:

“Before addressing our particular concerns with respect to this "environmental impact analysis," we wish first to comment on the selection process in general. According to the DEIS, the Nuclear Waste Policy Act acknowledged the "Federal Government’s responsibility" to provide for permanent disposal of our nation’s spent nuclear fuel and high-level radioactive waste. (DEIS at 1-9). This Act, set in motion a process whereby three "repository site candidates" were identified and approved. The DEIS goes on to note, that in 1987, Congress "significantly amended" the Act to single out only one of the sites for study. (Id.). Provisions in the Nuclear Waste Policy Act as amended in 1987 allow the DOE to prepare an environmental impact statement which doesn’t consider the need for a repository, alternative locations or alternatives to geological disposal. This amendment was attached at the last minute at the urging of the nuclear industry, it was not subject to wide debate or public discussion, hardly the actions of a DOE concerned about the future generations. By not including a needs statement or any alternatives the EIS process is completely subverted. The evaluation of alternatives is the heart of the NEPA process. The DOE was asked to include alternatives during the scoping process in 1995, yet has ignored the public’s
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requests. The DEIS fails to provide an adequate description of the process by which Yucca Mountain was singled out for exclusive study.

“The process, as outlined in the DEIS, fails to provide the reader with any insight whatsoever into the decision-making process that resulted in the need for and purpose of the document. From what one is presented with in the DEIS, it appears simply that Nevada lacks the political strength to defend itself. Without any discussion of the reasoning behind the singling out [of] Yucca Mountain, the Act appears undemocratic at best and fraudulent at worst. With ever increasing skepticism directed towards our Congress and political system, the need for truly open and honest democratic discourse cannot be debated. The DEIS needs to assure the reader that the purpose and need for the project are well reasoned and accurately reflect the reality of the situation. (Carrie Dann, EIS001965/10)

DOE Response 1.1 (10647):
Chapter 1 of the EIS explains that the Nuclear Waste Policy Act of 1982 established the Federal Government’s responsibility to provide permanent disposal of the Nation’s spent nuclear fuel and high-level radioactive waste and set forth a process and schedule for disposal of these materials in a geologic repository. The Act recognized a need to ensure that the materials now accumulating at commercial and DOE sites do not adversely affect the public health and safety and the environment [Section 111 (a)(7)]. In addition, it requires the Secretary of Energy to submit a Final EIS if recommending whether the President approve a site for the development of a repository [Section 114(a)(D)]. DOE believes that Chapter 1 adequately describes the purpose and need for the repository.

Response to DOE Response:
DOE does not have an obligation to examine in the EIS the reasons Congress designated only Yucca Mountain for site characterization. However, in the interest of transparency and public understanding, the agency does have a responsibility to accurately relate the context of the Yucca Mountain EIS and the purpose it serves. The above commenter did not find the Draft EIS adequate in this respect. Yet, DOE has made no significant additions to the discussion of the background of the Nuclear Waste Policy Act in the Final EIS. The sections on the history of nuclear waste management and the Nuclear Waste Policy Act in the Final EIS are virtually unchanged from those that appeared in the Draft EIS. This cannot be viewed as adequate in light of the commenter’s remarks.

Comment:
“The other points that I wanted to bring up concerns the nature of NEPA, the National Environmental Policy Act. Now it is my understanding that this act was created to help the U.S. Government with the input of U.S. citizens to make informed decisions about projects that affect the environment and to look at the environmental and different impacts associated with these decisions. Now one of the key parts of the NEPA process is defining a need, a need for the project, why are we going ahead with this in the first place. Right now we’re not convinced that the DOE has adequately justified the need for this project.” (Christopher Sewell, EIS000638/02)
Another commenter stated, “When all these other states voted to build the nuclear [power plants] they should have considered first how the radioactive material would be handled and where it would be ‘stored.’ In the beginning of the decision to build reactors was the time to determine where disposal would be and how.” (Donna M. Woods, EIS001945/07)

**DOE Response 1.1 (34):**
As described in Chapter 1 of the EIS, Congress determined, through the passage of the Nuclear Waste Policy Act of 1982, that the Federal Government has the responsibility to permanently dispose of spent nuclear fuel and high-level radioactive waste to protect the public health and safety and the environment. The Act states that the Federal Government must take precautions to ensure that these materials do not adversely affect this and future generations.

The passage by Congress of the original Nuclear Waste Policy Act of 1982 established the need for a geologic repository. But this policy was developed only after years of careful consideration of other disposal methods. DOE examined these alternatives, including disposal in salt domes, on islands, in oceanic trenches, in ice sheets, by transmutation, by injection into deep holes, and by launching the waste into outer space, in a 1980 EIS (DIRS 104832-DOE 1980). A 1981 Record of Decision to that EIS determined that DOE would pursue mined geologic disposal (46 FR 26677, May 14, 1981) (see Section 1.3.1 of the EIS). 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 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). The panel’s 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 National Research Council 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.

The Nuclear Waste Policy Act, as amended (NWPA), addresses how certain National Environmental Policy Act requirements apply to the proposed Yucca Mountain Repository. In particular, the Act specifies that DOE need not consider in the EIS the need for a repository, alternatives to geologic disposal, or alternative sites to Yucca Mountain.

**Response to DOE Response:**
While DOE is not directly obligated to analyze the need for a repository in the Yucca Mountain EIS, in order to most fully comply with NEPA, the issue of need should be considered to some extent. If DOE wishes to promote public confidence in the Yucca Mountain Project, the agency should discuss in greater detail the background and justification for the repository in the EIS. Comments on the Draft EIS have indicated that members of the public are unsatisfied with the EIS in this regard; the document seems to have created confusion as to how the need for this repository was first established. Unfortunately, DOE has not clarified this issue any further in the Final EIS.
**Comment:**
“I don’t understand why Congress has allowed this process to go through without addressing the need for this repository and the other – the availability for use and the alternatives to geologic disposal. I feel like it’s a sham.” (Lance Paul, EIS000633/01)

**DOE Response 4.5 (2243):**
As discussed in Section 1.5 of the EIS, the NWPA includes four provisions relevant to this EIS. Under the Act, the Secretary is not required to consider (1) the need for a geologic repository, (2) the time at which the repository could become available, (3) alternatives to isolating materials in a repository, and (4) any site other than Yucca Mountain for repository development. In 1980, DOE published the *Final Environmental Impact Statement, Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980). That EIS examined geologic disposal and other alternatives, including deep seabed disposal, ice sheet disposal, disposal in deep boreholes, transmutation, and space disposal. The Record of Decision (46 FR 26677; May 14, 1981) announced the DOE decision to use geologic disposal.

**Response to DOE Response:**
While DOE is not directly obligated to analyze the need for a repository in the Yucca Mountain EIS, in order to most fully comply with NEPA, the issue of need should be considered to some extent. If DOE wishes to promote public confidence in the Yucca Mountain Project, the agency should discuss in greater detail the background and justification for the repository in the EIS. Comments on the Draft EIS have indicated that members of the public are unsatisfied with the EIS in this regard; the document seems to have created confusion as to how the need for this repository was first established. Unfortunately, DOE has not clarified this issue any further in the Final EIS.

### 7. Environmental Impact Statement Process

#### a. General Comments

**Comment:**
“We request that, prior to site recommendation and prior to the required public ‘consideration hearings,’ DOE release the Final EIS and the comment response document so that the public may understand how DOE responded to its comments on the DEIS and supplement.” (Leonard Fiorenzi, 010392/16)

**DOE Response 3.5 (233):**
DOE considered comments on the Draft EIS, as appropriate, in the preparation of the Supplement to the Draft EIS. In part, for example, the comments received on the Draft EIS influenced DOE’s description of the flexible design elements presented in the Supplement.
Upon issuance of the Final EIS, the public will have the opportunity to examine the Comment-Response Document and the Department’s response to the public’s comments. This approach is consistent with regulations issued by the Council on Environmental Quality and DOE’s implementation procedures at 10 CFR 1021.

Consistent with the applicable regulations, the Department did not release the Comment-Response Document before issuing this Final EIS or hold hearings on the Comment-Response Document or this Final EIS. Should the Secretary of Energy recommend Yucca Mountain to the President, however, the recommendation would be accompanied by several supporting documents including the Final EIS and the Comment-Response Document. In the event Yucca Mountain was authorized and the project moved forward, DOE would submit a License Application to the Nuclear Regulatory Commission. The Nuclear Regulatory Commission’s licensing process would afford the public additional opportunities to review and comment on the specific design elements of the Yucca Mountain Repository. In the event DOE incorporated additional design modifications subsequent to the submittal of the License Application, the Nuclear Regulatory Commission’s licensing process would provide additional opportunities for the public to comment on the repository.

**Response to DOE Response:**
Eureka County does not find DOE’s response to its request satisfactory. Members of the public should have been given the opportunity to review the Final Environmental Impact Statement and Comment-Response Document before the Secretary of Energy recommended the site to the president. Under NEPA, the public plays an important role in the environmental impact analysis process. DOE has subverted this role by making a decision to recommend the repository before allowing the public a chance to assess whether DOE, in drafting the Final EIS, was actually responsive to the concerns voiced over the Draft EIS.

Recommending the site without first submitting the Final EIS for public review not only undermined public confidence in the project, it also directly violated federal regulations. The Council on Environmental Quality’s NEPA regulations explicitly specify that no decision should be made on a proposed action prior to a 30-day circulation period of a Final EIS (40 CFR 1506.10(b)(2)). However, the Secretary of Energy rendered DOE’s final decision on Yucca Mountain prior to any public review of the document and without waiting thirty days after publication of a notice of availability in the EPA’s Federal Register.

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**Comment:**
“We have a lot of people that are very interested in this issue. They are hungry for information. And they come to me to get that information. I need to feed them information. And so the message that I would like you to take back is that, yes, at least in Eureka County, in Crescent Valley, there are people who are really concerned, who really care, who really want to know what’s going on. And so I tell all federal agencies, when you are scheduling meetings, it would be great if you could, federal government, talk to each other so that we do not have meeting conflicts.
“Unfortunately, it was the Nuclear Regulatory Commission who yesterday scheduled a meeting on the modal study, already knowing that this meeting was being scheduled for today and that the Austin meeting was scheduled for Tuesday. We were not able to be represented at the Nuclear Regulatory Commission’s modal study meeting because we had to be here. And Department of Energy was on the calendar first.

“There are other times when Department of Energy is on the calendar second, and I’m just saying, there’s got to be enough days in the year so we can get to all of these meetings.” (Abby Johnson, EIS001104)

**DOE Response 3.3 (11704):**
DOE worked closely with the Nuclear Regulatory Commission and other groups to minimize schedule conflicts between the different meetings and conferences held on repository and nuclear waste issues. In some cases, these meetings were intentionally scheduled close together so out-of-town participants could attend the different forums. DOE apologizes for any inconvenience or hardship this might have caused those who were unable to attend all scheduled meetings. Minutes or transcripts of individual forums might be available from the sponsoring organizations.

**Response to DOE Response:**
Eureka County encourages DOE to continue to be vigilant regarding scheduling issues in the future.

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**Comment:**
“Because over 87 percent of our county is managed by the Bureau of Land Management, it seems that more input is required from that agency regarding the variety of impacts that the rail route could have on land and resources that they manage. We were surprised to read in Appendix C that the Department only met once with BLM and that there are no ongoing communication or interactions mentioned regarding the Department’s multi-faceted proposal. We would hope that BLM would not hold the Department’s proposed action to any lesser standard than they require of the mining and the ranching industries.” (Sandy Green, EIS000619/06)

**DOE Response 8.11.1 (3066):**
In the course of preparing the EIS, DOE coordinated with a number of government agencies and other organizations, including the Bureau of Land Management, by conducting formal consultations as required by the National Environmental Policy Act. Appendix C of the EIS documents these interagency and intergovernmental consultations. Nonetheless, Appendix C does not include the many staff-level interactions that occurred between the Bureau and DOE and were necessary for the development of the EIS. Information exchanges have occurred frequently in the past and are ongoing. These range from DOE providing informal status reports to the Bureau providing Geographic Information System data for utility corridors.
Should the Yucca Mountain site be approved, the branch rail line implementing alternative be selected, and a preferred rail corridor identified, 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 mitigative actions necessary to minimize potential impacts, including land use.

Response to DOE Response:
Since DOE has provided the public with no record of the “many staff-level interactions” and information exchanges between DOE and the Bureau of Land Management, there is no assurance that the number and scope of these interactions has been adequate. The public does, however, have access to the information contained in the Final EIS. In addition to the meeting between the two agencies documented in the Draft EIS, the Final EIS contains mention of only one subsequent meeting held between DOE and the Bureau of Land Management.

b. Discrepencies in the Draft Environmental Impact Statement

Comment:
“I would like to go on record as saying we need an alternative study to the proposed rail line. The members of Crescent Valley got together, and we found 60 unanswered questions in one hour. We feel that a rail line is inconsistent with the growth of this community. We found towns named that aren’t here, and we found towns that were here that weren’t really referred to.” (Patti Leppala, EIS000620/01)

DOE Response 3.1 (2207):
DOE cannot respond to unanswered questions without specific details, such as the reference to correct or incorrect town names in the EIS. With regard to a rail line being inconsistent with community growth, DOE has identified a number of areas in Crescent Valley that the proposed transportation corridors could affect. At this time, however, more detailed information is not available on the parcels of land that could be affected. As indicated in Section 9.3.1 of the EIS, DOE would develop mitigation measures if construction and operation of repository-related facilities could result in (1) impacts to publicly used lands, (2) direct and indirect land loss, and (3) displacement of capital improvements.

Response to DOE Response:
While the commenter did not give specific details on the deficiencies of the Draft EIS, she highlighted the larger issue of the overall inadequacy of the transportation analysis. DOE’s above response does little to ease these concerns. Merely “identifying” areas that the rail corridor could affect, without enumerating and analyzing the impacts is insufficient. Moreover, since even in the absence of detailed analysis it is clear that a rail route would significantly impact public and private lands, mitigation measures should be developed at this time.
Comment:
In regard to the inadequacy of the Draft EIS, one commenter wrote, “[d]uring the public hearings in Crescent Valley, both Western Shoshone and local residents pointed out numerous factual flaws in the EIS, in particular concerning the transport routes through Crescent Valley. Based upon the inaccurate information presented, we find it quite likely that the remainder of the EIS is filled with similar inaccuracies. Considering the expense of this project, the DOE has done a very sloppy job of evaluating the impacts. We do not feel it is our job to point out the various on the ground mistakes made, mistakes that would not have been made had the DOE staff actually visited the communities and routes proposed for the transport of the nuclear waste. The DEIS is fundamentally and fatally flawed.” (Carrie Dann, EIS001965/18)

Another commenter stated, “The DEIS contains inadequate, incomplete and inaccurate information…How can it be adequate when it devotes so little attention to the rail route? In simple numbers of pages, it is less weighty than the DEIS required for a single mine at the end of our valley – Yucca Mountain as a repository and the transport of nuclear waste have much more impact than one mine! A thorough DEIS must be done – and please be accurate, from big through small things – Cortez, Gold Acres, [and] Tenabo are ghost towns with historic status but they are not “communities,” for example.” (Susan Fye, EIS001156/07)

One of the Eureka County Commissioners also weighed in on this subject: “…Eureka County believes that the DOE’s Environmental Impact Statement is inadequate and incomplete. We believe that the information in the current document is not adequate and should not be used by itself as a decision or a tool for the selection of a mode or route for transportation. The lack of mitigation in the document indicates that DOE does not truly understand the magnitude of the impacts in this area with this major project. The cumulative impact analysis lacks the depth we would like from such a large government project. This is going to span generations. We expect that the DOE will revise this Draft EIS significantly and address the deficiency and to provide a level of detail needed for us to make an informed decision.” (Pete Goicoechea, EIS000630/10)

Finally, an additional commenter added, “I see it as really hypocritical that the federal government would require such a level of detail of information from private industry in regards to the mining industry for all their projects on federal lands, and then would exempt itself from the same level of detail in evaluating this project, this Yucca Mountain project.” (Christopher Sewell, EIS000638/08)

DOE Response 3.2 (80):
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.

As discussed in Section 1.5.1 of the EIS, DOE initiated public scoping in 1995, eventually holding public meetings in 15 locations across the country. The purpose of this process was to determine the scope of the EIS and to identify significant issues this EIS would analyze in depth. The Draft EIS was the outcome of this process.
DOE agrees that the scope of the Yucca Mountain Project and, thus, the EIS is complex and has unique features. In recognition of this complexity, DOE has analyzed a variety of implementing alternatives and scenarios under a Proposed Action to construct, operate (including transportation) and monitor, and eventually close a repository at Yucca Mountain. These alternatives and scenarios reflect potential repository design and operating modes, waste packaging approaches, transportation modes, and corridors/routes for shipping spent nuclear fuel and high-level radioactive waste to the Yucca Mountain site from 72 commercial and 5 DOE sites around the nation. DOE included a No-Action Alternative that analyzed two scenarios to provide a basis for comparison with the Proposed Action and reflect the range of impacts that could occur.

For both the Proposed Action and No-Action Alternative, the EIS evaluates the affected environments and estimates potential environmental impacts in regions of influence for the resource areas. DOE selected these regions and resource areas for analysis consistent with Council on Environmental Quality regulations (40 CFR 1502.15) that indicate that the data and analyses should be commensurate with the likely importance of the potential impact. Thus, the EIS addresses the various potential environmental impacts in proportion to their potential significance. Clearly insignificant or minor impacts are addressed in less detail.

In the EIS, DOE used the best available data and 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).

Further, as discussed in Section 2.5 of the EIS, DOE identified the use of incomplete information or the unavailability of information to identify uncertainties in the data or analytical approaches. In addition, the Department acknowledges that the results of analyses often have uncertainties and has described such uncertainties throughout the EIS.

To resolve some of the uncertainties and to provide information on the repository design that became available after publication of the Draft EIS, DOE published in May 2001 the Supplement to the Draft EIS and made it available for public review. While aspects of the design evolved from those in the Draft EIS, the basic elements of the Proposed Action to construct, operate and monitor, and eventually close a geologic repository at Yucca Mountain remained unchanged. For this reason, the Supplement focused on the most recent design enhancements, including various operating modes to manage heat generated by emplaced spent nuclear fuel and high-level radioactive waste.

DOE considered each public comment it received in its development of this Final EIS. In response to comments, DOE has modified the EIS in a variety of ways, including clarifications or changes to the text, new or more recent information (such as 2000 Census data and population projections), and modified analyses (such as those for transportation impacts in which it modified the characteristics of the representative commercial spent nuclear fuel and accident source terms). DOE also modified the EIS to include new information obtained since it issued.
the Draft EIS. The Department obtained such information from site characterization activities and design evaluations, including, for example, updated radon emanation data and the most recent design features.

Response to DOE Response:
Regardless of the many factors stated in the above response, the Final EIS still fails to include adequate information on several of the subjects mentioned by commenters dissatisfied with the Draft EIS. For example, no actions qualifying as adequate mitigation measures under NEPA have been disclosed. The analysis of cumulative impacts relating to transportation remains weak. And of most concern to residents of Eureka County, the impacts of a rail route have not been thoroughly assessed, a problem confounded by DOE’s assertion that the information contained in the Final EIS is sufficient to designate rail as the preferred mode of transportation.

In the above response, DOE discusses the public scoping comments in 1995 and states that the Draft EIS was the result of these comments. However, in both the Draft and Final EIS DOE ignored many of the issues raised by Eureka County residents in the scoping process. A glaring example is DOE’s failure to analyze meaningful alternatives to Yucca Mountain in the EIS, as requested by commenters. The No-Action Alternatives presented in the EIS are, by DOE’s own admission, “not likely” (p. 1-22) and therefore cannot be considered useful or meaningful in the context of NEPA.

Comment:
“The other thing that really concerns me, especially after hearing the presentations, is how many times I heard the word assume. Is that so many parts of the details of this project, the devil is in the details. We assume this, we assume that, we don’t know yet. It’s a concept. We assume. I think we all know the joke about assuming. And I think it’s very true in this case.” (Christopher Sewell, EIS00638/04)

DOE Response 3.2 (2337):
The EIS acknowledges in Section 2.5 that the results and conclusions of analyses often have associated uncertainties. Uncertainties could be the result of the complexity and variability of the process, the use of incomplete information, or the unavailability of information. DOE describes such uncertainties throughout the EIS.

If information is incomplete or unavailable or if there are uncertainties, assumptions often enable analyses to proceed. In such instances the assumptions and analytical methods conservatively represent (that is, they tend to overestimate) the reasonably foreseeable impacts that could occur from implementing the Proposed Action.

Preliminary Response to DOE Response:
There are tremendous uncertainties involved in this project. While DOE has made conservative estimates in order to account for these uncertainties, the commenter reflects the concern that
many members of the public have expressed over DOE’s ability to make accurate assumptions about Yucca Mountain 10,000 years into the future.

Comment:
Eureka County residents noted that the Draft EIS was inadequate because it uses outdated 1990 Census data rather than current population data for Nevada.

DOE Response 7.5.6 (130):
When preparing the Draft EIS, DOE based the Nevada population estimates on the then-most-recent available information (1996 to 1997) from the Bureau of the Census. The Final EIS uses Nevada population data that incorporates data developed by and received from county and State officials.

DOE used the Regional Economic Models, Inc. (REMI) Economic and Demographic Forecasting System (EDFS) 53-sector computer model to project population growth in the regions of influence and to evaluate socioeconomic impacts from the Proposed Action. For the Final EIS, this model incorporates population estimates from 1998 to 1999 provided by Nye and Clark Counties for the socioeconomic baseline. For Lincoln County and the Rest of Nevada, DOE used State Demographer estimates as input to the REMI model. DOE compared these locally derived estimates to the 2000 data provided by the Bureau of the Census.

In general, the Bureau of the Census is the preferred source of information for use in DOE socioeconomic analyses because it provides a greater level of consistency across geopolitical boundaries than most other data sources. Bureau information is based on the direct collection of information, while other information sources often rely either on some form of the Bureau information or on proxies such as telephone and electrical connections to households and businesses. The information for a particular variable provided by local and state agencies or private vendors can differ, sometimes significantly, from one another because of the use of different methods, source data, level of detail and terminology. In addition, Bureau of the Census information is readily available and population estimates are updated annually.

In response to comments, however, DOE has updated its socioeconomic baseline projections and estimated impacts for the Final EIS to reflect the most recent data available from the State of Nevada and local communities, as well as the 2000 Census population summary data for Nevada.

In March 2001, the Bureau of the Census released its county-level population data for the State of Nevada based on 2000 Census. DOE then updated the baseline projection to 2000 Census data for the State of Nevada. The 2000 Census data baseline was then compared to baseline projections utilizing State and local data. Sensitivity analyses of the two data sets indicated that the differences between the two baselines were small. DOE’s population projections and impact estimates in the Final EIS are based on the most recent available information from State and local sources.
Similarly, DOE’s population projections to 2035 within 80 kilometers (50 miles) of the repository use the most recent available information from State and local sources. DOE determined the number of individuals within a particular sector within the 80-kilometer area based on surveys conducted in 2000. Figure 3-25 of the EIS provides the projected population distribution for 2035.

The Final EIS baseline uses REMI computer model projections of population totals for each county to 2035. The Clark County projections correspond to those used by the University of Nevada, Las Vegas (DIRS 136698–Riddel and Schwer 1999), which are also based on the REMI EDFS 53-sector model. The Nye County population projections for the Final EIS are based on data supplied by Nye County (DIRS 150996-Williams 2000; DIRS 148140-PIC 1998) that are based, in part, on a REMI 14-sector model. For Lincoln County and the rest of Nevada, population projections by the Nevada State Demographer’s Office (Nevada Statistical Abstract) through 2018 were used as inputs to population projections for these areas. DOE used data from these sources to project the population distribution within the 80-kilometer radiological monitoring grid. For Inyo County, DOE used the California Department of Finance projections (DIRS 105294-State of California 1998) to project population distributions.

To update the health and safety analyses associated with transportation in Nevada, DOE used the baseline population for each county in the region of influence and forecast to 2035 to scale impacts from results based on the 1990 census. For example, if a county’s population was estimated to double from 1990 to 2035, DOE assumed that the population along the associated rail corridor also would double; radiological impacts were then doubled accordingly. In certain locales, however, such as around the planned Las Vegas Beltway, DOE used local sources of population information to better reflect population growth trends (in this instance information from a report prepared for the City of North Las Vegas).

As discussed in Section 5.2.4.1 of the EIS, DOE accepts the position of the National Academy of Sciences that it is not possible to accurately predict future human behavior. DOE used a default position of today’s conditions. For the Final EIS, DOE has projected baseline population and other economic measures to 2035.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
One commenter noted inconsistencies related to the information about the Carlin rail corridor in the Draft EIS, noting especially differences in the rail routes on two different maps. The commenter also questioned impacts on the operation of the Cortez Mine, Placer Dome, and other mining claims in the area of the rail route. The commenter was concerned about land restrictions, restrictions to access and compensation for those with mining claims, finding the analysis of these issues in the Draft EIS inadequate. (Joseph Carruthers, EIS000623/03)
Another commenter stated, “Now on the wall is a map, and in the DEIS statement is a map, and the two maps are different as far as the corridor. I want this registered. It’s 6-59, and on page 6-61 it tells where the railway is going through, but there are two towns that aren’t really towns that are inhabited any more, and that’s Gold Acres and Tenabo, and we would like you to look at that because this is also inaccurate.” (Patti Leppala, EIS000635/02)

**DOE Response 3.1 (21): excerpts**

DOE has studied the information in the EIS to eliminate inconsistencies and ensure the accuracy of information related to alternative rail and heavy-haul truck corridors. Specifically, DOE modified transportation figures to include Pahrump and other geographic features.

DOE is aware of the Cortez Gold Mines operation in Crescent Valley, as well as other mining operations and claims. Sections 8.1.2.3 and 8.4.2 discuss the Cortez Gold Mines and describe possible impacts. At this time, however, more detailed information is not available for each particular transportation alternative. As indicated in Section 9.3.1, DOE would develop mitigation measures if construction and operation of facilities could result in (1) impacts to publicly used lands, (2) direct and indirect land loss, and (3) displacement of capital improvements.

Gold Acres and Tenebo are historic reference points in the vicinity of the Carlin Corridor. To avoid confusion, they have been deleted from the list of communities in the EIS.

DOE used the railroad maps displayed at the public hearings for their scale and depth of detail. DOE has added tables to Appendix J of the EIS to list transportation impacts for each state, and has added maps for each route analyzed (see Section J.4).

**Response to DOE Response:**

While DOE has slightly expanded its discussion of the impacts associated with each of the candidate rail corridors in the Final EIS, the analysis remains an inadequate base from which to make a route selection. Statements such as, “[a]t this time…more detailed information is not available for each particular transportation alternative,” are an insufficient response to the questions raised by commenters. DOE should have gathered information on all possible impacts of the rail routes, including those to mining, for inclusion in the Final EIS. Having failed to do this, DOE must now collect and analyze this information prior to issuing any Record of Decision that designates a preferred rail route. DOE must also disclose measures to mitigate impacts at this time.

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**Comment:**

“On page 3-114 of the draft, it states that Native Americans live in the vicinity of two of the candidate rail corridors, Jean and Valley Modified, and this statement should be corrected to acknowledge that the Western Shoshone Dann sisters live in Crescent Valley in the vicinity of the proposed Carlin route.” (Sandy Green, EIS000619/04)

**DOE Response 3.1 (3064):**
DOE has modified the statement referenced in this comment to indicate that Native American communities are present in at least two of the candidate rail corridors. In addition, DOE has added text to indicate that Western Shoshone families own land in Crescent Valley near the Carlin Corridor.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
“One of the first [issues] I’m concerned about is simply the term that we’re using for the materials that will be transported. The term spent fuel gives the sense that it’s less radioactive than it actually is. I think most of us are used to using the term spend in terms of our family budgets and that sort of thing. And when you spend your money and you look in your checkbook, you got a balance of zero; right?

“Well, when you talk about spent nuclear fuel, we’re talking about materials that are a million times more radioactive after its use in a reactor than before. I don’t think any of us will find a million dollars at the end of our checkbook balance. I feel that is a very misleading term for normal people, and I would ask that the DOE look into using a more appropriate term such as irradiated fuel.” (Jennifer Olaranna Viereck, EIS000622/01)

DOE Response 6.1 (120):
The Nuclear Waste Policy Act of 1982 and the Glossary to the EIS (Chapter 14) define "spent nuclear fuel" as "fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing." DOE uses the term in the EIS to be consistent with the Act, not to be misleading. Appendix A describes the relevant characteristics of this material used to evaluate the environmental and safety impacts.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

Comment:
“Another area where the draft is deficient is in its treatment of existing rail and highway within Nevada. For example, from West Wendover to Beowawe, the interstate and Union Pacific rail line go through several communities and cross the Humboldt several times, and you would never know that from reading the draft.” (Sandy Green, EIS000619/08)

DOE Response 8.8.2 (3067):
The portions of routes that use existing rail and highways within Nevada were analyzed for each of the transportation implementing alternatives in Nevada as part of the national transportation analysis discussed in Sections 6.2.3.1 and 6.2 3.2 of the EIS. The range of impacts associated with this analysis can be found in Tables 6-8 and 6-9 for legal-weight trucks and Tables 6-11 and 6-12 for railroads. Maps of the representative national routes analyzed are given in Figures 6-11.
and 6-12. In addition to analyzing the impacts of using routes that would meet U.S. Department of Transportation requirements for transporting spent nuclear fuel, DOE evaluated how the estimated impacts would differ if legal-weight trucks or railroads used other routes in Nevada in Section J.3.1. This section describes alternate routes and alignments within Nevada, identifies differences in lengths and population distributions, lists potential infrastructure upgrade needs, and assesses the impacts to individuals and populations along each of these routes. Comparisons of impacts based on populations along specific highways in Nevada are provided in Table J-48. Both the rail and highway transportation analyses have taken into account the population of the communities along the routes and the estimated accident characteristics of the given routes. Specific incident rates for Nevada routes were provided by the State and used in the analyses.

Response to DOE Response:
Eureka County has no further comments on DOE’s response.

c. Supplemental Draft Environmental Impact Statement

Comment:
“The Supplement states, ‘DOE invites comments on its intention not to address the Draft EIS design in the Final EIS.’ Certainly, even as the design is evolving, the design described in the DEIS is an alternative which should be considered as part of the full scope of bounding alternatives. It would be very helpful to the public to have the draft EIS design addressed in the Final EIS to understand why it is no longer being considered by DOE.” (Leonard Fiorenzi, 010392/07)

DOE Response 3.5 (13524):
DOE has decided to focus the discussion in the Final EIS on the flexible design. As such, DOE has estimated a range of operational scenarios that reflect the latest information available. In addition, DOE also included a discussion of how the flexible design evolved since the issue of the Draft EIS.

Response to DOE Response:
To give meaning to analyses conducted under NEPA, a range of alternatives and options must be considered. Addressing the Draft EIS repository design in the Final EIS would have widened the scope of options and added more depth to the analysis of the impacts of different design scenarios. It is regrettable that DOE has chosen, once again, to eliminate a possibility instead of further exploring its potential.

Comment:
“Eureka County is especially interested in the Supplement’s option for a low temperature operating mode which would require a fuel blending inventory at the site to allow for blending of hotter spent nuclear fuel with cooler fuel to maintain the waste package temperature at 85 degrees C or less. The surface aging facility is the functional equivalent of an interim storage facility or monitored retrievable storage (MRS) facility. The co-location of a repository and an
MRS is specifically prohibited by the Nuclear Waste Policy Act.” (Leonard Fiorenzi, 010392/08)

DOE Response 4.5 (92):
Consistent with the NWPA, DOE performed detailed evaluations of the Yucca Mountain site. However, scenarios for possibly moving the spent nuclear fuel and high-level radioactive waste to a centralized interim storage or monitored retrievable storage site have been evaluated by others (see Table 7-1 in Chapter 7 of the EIS). For example, the Private Fuel Storage facility at Skull Valley, Utah is currently under study by the Nuclear Regulatory Commission. Since the publication of the Yucca Mountain Draft EIS, the Commission issued a Draft EIS related to the construction and operation of a privately owned facility at Skull Valley in Utah to store as much as 40,000 metric tons of heavy metal (MTHM) of commercial spent nuclear fuel (DIRS 152001-NRC 2000). DOE recognizes interim storage at the Private Fuel Storage facility in Utah to be a reasonably foreseeable future action and has included this proposed action as part of the cumulative impacts analysis in Chapter 8. Further, this Final EIS evaluates potential cumulative transportation impacts associated with the interim storage of 40,000 MTHM of commercial spent nuclear fuel to the proposed facility at Skull Valley (see Section 8.4).

Congress has not enacted legislation, introduced on several occasions, to amend the NWPA to allow interim storage at the Yucca Mountain site. Therefore, DOE has focused its evaluation on the Yucca Mountain Repository as directed by the NWPA. The Proposed Action analysis includes storage only to the extent that storage would be part of repository operations. The Environmental Protection Agency standards (40 CFR Part 197) establish environmental compliance limits for a Yucca Mountain Repository to protect human health and safety. The standards contemplate storage in the normal sense of preclosure repository operations as defined in Subpart A, "Environmental Standards for Storage."

Although the flexible design described in this Final EIS includes the potential for an aging facility for storage of as much as 40,000 MTHM over 50 years, DOE has proposed that facility as an operational option that could provide a cost-effective method of achieving a lower-temperature repository. DOE does not believe that the siting limitations for interim storage facilities in the Nuclear Waste Policy Act constrain the operational flexibility or ultimately the long-term performance of the repository. Rather, the Department believes that the spent nuclear fuel aging facility option constitutes a potential operational element of the repository.

Response to DOE Response:
While a “spent nuclear fuel aging facility” may be a component of repository operations, if it is to store the waste for over 50 years, it will nevertheless function as an interim storage facility. As the commenter stated, the Nuclear Waste Policy Act specifically prohibits locating an interim storage facility on the same site as the repository. DOE should develop a legal method of achieving a lower-temperature repository rather than resort to merely bending the definitions of the NWPA to serve its purposes.
Comment:
“We are also concerned that the SDEIS did not adequately address the transportation implications of shipping hotter fuel sooner [as required by the new flexible design]. This is a significant oversight that renders the Supplement as deficient as the original DEIS.” (Leonard Fiorenzi, 010392/09)

DOE Response 8.12 (224):
DOE does not anticipate that the flexible design would have any effect on the characteristics of spent nuclear fuel that would be shipped to a Yucca Mountain Repository or, consequently, on the casks and modes of transport that would be used for shipment. Therefore, DOE does not expect that the health and safety risks of transporting spent nuclear fuel and high-level radioactive waste to Yucca Mountain, or the consequences of maximum reasonably foreseeable transportation accidents would be different for the flexible design from those associated with the design presented in the Draft EIS.

Nevertheless, in response to public comments on the Draft EIS concerning the age and burnup assumed for spent nuclear fuel used in accident analyses, DOE reevaluated the characteristics of spent nuclear fuel that it would receive. As a result of this reevaluation, DOE determined that the accident hazard for spent nuclear fuel with a cooling time of 15 years for pressurized-water reactor fuel assemblies and 14 years for boiling-water reactor fuel assemblies represents the midpoint of the cumulative hazard of all spent nuclear fuel that would be shipped. As a consequence, analyses of accidents presented in the EIS use the characteristics of "representative" spent nuclear fuel described in Appendix A of the EIS. The projected average age of spent nuclear fuel delivered to a repository would be that described for "typical" spent nuclear fuel in Appendix A.

Response to DOE Response:
DOE’s use of “representative” spent fuel characteristics to identify transportation impacts does not inspire public confidence in the comprehensiveness of the impact analysis. The averaging of impacts eliminates the need for identifying the very worst-case scenarios. As an accident involving the shipment of hotter spent fuel would likely cause greater damage than one involving colder, older fuel, DOE should specifically analyze the impacts associated with such an accident. Averaging the factors contributing to an accident’s impacts leaves out the worst-case scenarios and fails to give the public an accurate picture of the true range of impacts possible.

8. Repository Design

a. Hydrology

Comment:
One Eureka County native commented on the issue of water contamination near the repository site: “DOE has admitted that [the] dump will leak over course of time. It is unacceptable to contaminate water. Water is the source of life. It has significance culturally, spiritually, biologically, and economically. This is the most arid state of the union, water is more precious
than gold. It is irresponsible and bad policy to allow its permanent contamination. Water is already contaminated at the Nevada Test Site, Hot Creek Valley and near Fallon from nuclear tests. Enough is enough.” (Carrie Dann, EIS001965/06)

Another commenter stated, “Experts say it will leak into the water table in time and poison a huge agricultural area in N.V.” (Lee Louden, EIS001944/10)

DOE Response 7.5.3.2 (230):
Based on the results of analyses reported in Chapter 5 of the EIS, DOE believes that a repository at Yucca Mountain would have negligible short and long-term environmental impacts. DOE recognizes that some radionuclides and toxic chemicals could eventually enter the environment outside the repository. Modeling of the long-term performance of the repository, which considered faults, earthquakes, volcanism, and fast-flow movement of water through the mountain, shows that the natural and engineered barriers at Yucca Mountain would keep the release of radioactive materials during the first 10,000 years after closure well below the limits established by 40 CFR Part 197 (see Sections 5.4 and 5.7 of the EIS for additional information). Modeling also shows that the release of toxic chemicals would be far below the regulatory limits and goals established for these materials (see Section 5.6 of the EIS for additional information).

Sections 3.1.3 and 3.1.4 of the EIS describe the geologic and hydrologic settings of Yucca Mountain and the surrounding region in great detail. Subsections of 8.2 and 8.3 consider the cumulative impacts to groundwater from the repository, the Nevada Test Site, and other activities in the area that could contribute to long-term groundwater pollution. DOE believes that the information in the EIS on the amount and type of contaminants released over time from the repository and from other sources in the region have been adequately described and analyzed in the EIS. Estimated releases to the accessible environment during and after the 10,000-year regulatory period would be limited geographically to the groundwater flow system described in Section 3.1.4.2 of the EIS; contaminants from the repository could not reach the Las Vegas Valley, the Colorado River, or any other parts of Nevada and California.

DOE acknowledges that it is not possible to predict with certainty what will occur thousands of years into the future. Section 5.2.4 of the EIS describes how DOE dealt with these uncertainties. The National Academy of Sciences, the Environmental Protection Agency, and the Nuclear Regulatory Commission also recognize the difficulty of predicting the behavior of complex natural and engineered barrier systems over long time periods. The Nuclear Regulatory Commission indicates that absolute proof is not to be had in the ordinary sense of the word (see 10 CFR Part 63), and the Environmental Protection Agency finds that reasonable expectation, which requires less than absolute proof, is the appropriate test of compliance (see 40 CFR Part 197).

DOE, consistent with recommendations of the National Academy of Sciences, has designed its performance assessment to be a combination of mathematical modeling, natural analogues, and the possibility of remedial action in the event of unforeseen events. Performance assessment explicitly considers the spatial and temporal variability and inherent uncertainties in geologic, biologic and engineered components of the disposal system and relies on:
1. Results of extensive underground exploratory studies and investigations of the surface environment.

2. Consideration of features, events and processes that could affect repository performance over the long-term.

3. Evaluation of a range of scenarios, including the normal evolution of the disposal system under the expected thermal, hydrologic, chemical and mechanical conditions; altered conditions due to natural processes such as changes in climate; human intrusion or actions such as the use of water supply wells, irrigation of crops, exploratory drilling; and low probability events such as volcanoes, earthquakes, and nuclear criticality.

4. Development of alternative conceptual and numerical models to represent the features, events and processes of a particular scenario and to simulate system performance for that scenario.

5. Parameter distributions that represent the possible change of the system over the long term.

6. Use of conservative assessments that lead to an overestimation of impacts.

7. Performance of sensitivity analyses.

8. Use of peer review and oversight.

DOE is confident that its approach to assessing the long-term performance of the repository addresses and compensates for important uncertainties, and provides a reasonable estimation of potential impacts associated with the ability of the repository to isolate waste over thousands of years.

Meanwhile, DOE recognizes that the acquisition of additional data would further reduce uncertainties. Studies are planned to gather some of this information. Section 2.1.2.3 of the EIS describes the types of tests, experiments, and analyses the Department would conduct during the "performance-confirmation" phase of the program. This program would continue for perhaps as long as 300 years after emplacement ends (through closure of the repository as described in Section 2.1.2). The purpose of the performance-confirmation program is to evaluate the accuracy and adequacy of the information used to demonstrate compliance with performance objectives.

Response to DOE Response:
While DOE believes it has adequately addressed the vast uncertainties inherent in this project, the agency cannot guarantee that a repository would not result in future environmental contamination. In the above statement, DOE “recognizes that some radionuclides and toxic chemicals could eventually enter the environment outside the repository.” And though DOE believes it can engineer a repository that would keep this contamination under regulatory limits for 10,000 years, the long term, post-10,000 year environmental consequences are not speculated on. The above commenters are obviously unsatisfied with the inevitability of this contamination, whatever its extent. However, given its decision to go forward with a Yucca Mountain repository, DOE evidently did not consider this inevitability grave enough to derail the project.
**Comment:**
“There’s also a concern about what water will be used in that area. The water in that area that is being discussed for use in making cement and that kind of thing, spraying down the grounds, is already potentially contaminated from testing. Testing took place above, below and actually within the water table at the Nevada Nuclear Test Site.” (Jennifer Olaranna Viereck, EIS000622/12)

**DOE Response 7.5.3.2 (2228):**
Section 3.1.4.2.2 of the EIS addresses groundwater quality. As part of DOE’s effort to characterize Yucca Mountain, DOE has monitored water quality in wells and springs throughout the area. There is no indication that DOE activities at the Nevada Test Site have contaminated the groundwater beneath Yucca Mountain or the water in wells J-12 and J-13, which is used for site characterization activities at Yucca Mountain. The nuclear tests referred to in this comment occurred 30 to 40 kilometers (19 to 25 miles) northeast of the Yucca Mountain site. There is evidence from monitoring at the Nevada Test Site that plutonium has migrated about 1.3 kilometers (0.8 mile) from one underground test (DIRS 101811-DOE 1996). For analytical purposes, Section 8.3.2.1.1 of the EIS assumed that radioactivity from weapons testing on the Nevada Test Site would eventually be transported by groundwater to the same sites analyzed in the EIS for releases from the repository. The cumulative dose from the repository and the Nevada Test Site 18 kilometers (11 miles) south of the repository after 10,000 years is estimated in the EIS to be 0.42 millirem per year [0.22 millirem from the repository (the mean dose) and 0.2 millirem from weapons testing].

**Response to DOE Response:**
Eureka County has no further comments on DOE’s response.

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**b. Seismology**

**Comment:**
“This state does not need any nuclear [repository] here. It’s proven there’s fault lines in Yucca Mountain. I was on a tour down at Yucca Mountain. I was amazed.” (Charles R. Harper, EIS000644/01)

**DOE Response 7.5.3.2 (111): excerpts**
As part of its site characterization activities, DOE has conducted a variety of investigations into the nature of water falling as precipitation on Yucca Mountain and passing through the unsaturated zone to the groundwater beneath. One such study has been to quantify the concentrations of certain radioisotopes in the Exploratory Studies Facility. Isotopes, such as chlorine-36 and tritium, which occur naturally and as a byproduct of atmospheric nuclear weapons testing, respectively, serve as indicators of the rate of flow through the unsaturated zone.
Results from preliminary studies have identified these isotopes in concentrations that tend to suggest that there are connected pathways through which surface precipitation has percolated to the repository horizon within the last 50 years. However, these isotopes have been found at locations that are generally associated with known, through-going faults and well-developed fracture systems close to the faults at the proposed repository horizon.

To ensure the correct interpretation of this chemical signal, DOE instituted additional studies to determine if independent laboratories and related isotopic studies can corroborate the detection of elevated concentrations of these radioisotopes. Results of the validation studies to this point have not allowed firm conclusions and, thus, the evaluations continue.

DOE believes that these findings do not indicate that the Yucca Mountain site should be declared unsuitable for development as a repository. Most of the water that infiltrates Yucca Mountain moves slowly through the matrix and fracture network of the rock, and isotopic data from water extracted from the rock matrix indicates that residence times are generally several thousand to as long as 10,000 years. Furthermore, after excavating more than 11 kilometers (8.4 miles) of tunnels at Yucca Mountain, DOE determined that only one fracture was moist (there was no active flow of water). This observation has been confirmed in test alcoves that are not subject to the effects of drying from active ventilation.

Nevertheless, the total system performance assessment incorporates the more conservative water movement data as well as information from other water infiltration and associated hydrogeological studies. As a result of this evaluation, DOE would not expect the repository (combination of natural and engineered barriers) to exceed the prescribed radiation exposure limits during the first 10,000 years after closure.

With regard to the expected long-term performance of the repository, modeling described in Chapter 5 shows that the combination of natural and engineered barriers at Yucca Mountain would keep the release of radioactive materials from the repository to very small amounts during the first 10,000 years after permanent closure. This would comply with the limits specified by the Environmental Protection Agency in 40 CFR Part 197, Environmental Radiation Protection Standards for Yucca Mountain, Nevada.

**Response to DOE Response:**
As this was a response to a number of different comments, the issue to which the Eureka County resident was most likely referring to – the possibility of earthquakes at Yucca Mountain – was not addressed.

Regarding the potential for water to travel through the faults in the mountain, DOE should complete the “validation studies” of this phenomenon and come to “firm conclusions” about its potential to increase the rate of waste package degradation before taking any action toward constructing a repository. Under the original site suitability guidelines, water movement such as this may have been grounds for disqualifying the site. Even though this is no longer the case under the revised guidelines, DOE must come to a more conclusive understanding of water flow in Yucca Mountain prior to proceeding with the repository project.
Comment:
“In regard to the Yucca Mountain Draft Environmental Impact Statement (EIS). I take a strong objection as a geologist with 32 years experience that the proposed Yucca Mountain area is a geological stable area.

“Swarms of earthquakes are now being reported just North of Beatty. This type of seismic activity is similar to the earthquake activity that was recorded at Mt. Saint Helens before the last volcanic eruption.

“The proposed Yucca Mountain Depository is made up of volcanic rocks with cinder cones that have been dated at less than 10,000 years old. It is not a question if there will be additional earthquakes and volcanic activity in the area but when will it occur and to what magnitude.

“Construction of a depository that must be stable for 10,000 years or more in a volcanic area is not conceivable.” (James D. Sefton, EIS001434/01)

DOE Response 7.5.3 (4498):
Based on the results of analyses reported in Chapter 5 of the Draft EIS concerning the long-term performance of the repository, which considered the effects of future seismic and volcanic activity, DOE believes that a repository at Yucca Mountain would operate safely in compliance with the Environmental Protection Agency’s Environmental Radiation Protection Standards at 40 CFR Part 197. Section 3.1.3 of the EIS describes the geologic setting of Yucca Mountain and the surrounding region in great detail, including faults, seismicity, and the volcanic history of the region.

Section 3.1.3 of the EIS discusses the Lathrop Wells cinder cone which, at between 70,000 and 90,000 years old, is the youngest volcanic center in the region. Section 4.1.8 describes the impacts from accident scenarios associated with earthquakes during operation of the repository. Several sections in Chapter 5 of the Draft EIS consider earthquakes and volcanic eruptions and their effects on the long-term performance of the repository. Except for some factual changes and clarifications that have been included in the Final EIS, DOE believes that the information in the Draft EIS on geology, geologic hazards, and the effects of these hazards on the repository, have been adequately described and analyzed in the EIS.

Regarding the inherent uncertainty associated with geologic data, analyses, and models, and the confidence in estimates of long-term repository performance, Section 5.2.4 of the EIS explains how DOE dealt with these issues. Briefly, DOE acknowledges that it is not possible to predict with certainty what will occur thousands of years into the future. The National Academy of Sciences, the Environmental Protection Agency, and the Nuclear Regulatory Commission also recognize the difficulty of predicting the behavior of complex natural and engineered barrier systems over long time periods. The Commission regulations (see 10 CFR Part 63) acknowledge that absolute proof is not to be had in the ordinary sense of the word, and the Environmental
Protection Agency has determined (see 40 CFR Part 197) that reasonable expectation, which requires less than absolute proof, is the appropriate test of compliance.

DOE, consistent with recommendations of the National Academy of Sciences, has designed its performance assessment to be a combination of mathematical modeling, natural analogues, and the possibility of remedial action in the event of unforeseen events. Performance assessment explicitly considers the spatial and temporal variability and inherent uncertainties in geologic, biologic and engineered components of the disposal system and relies on:

1. Results of extensive underground exploratory studies and investigations of the surface environment.

2. Consideration of features, events and processes that could affect repository performance over the long-term.

3. Evaluation of a range of scenarios, including the normal evolution of the disposal system under the expected thermal, hydrologic, chemical and mechanical conditions; altered conditions due to natural processes such as changes in climate; human intrusion or actions such as the use of water supply wells, irrigation of crops, exploratory drilling; and low probability events such as volcanoes, earthquakes, and nuclear criticality.

4. Development of alternative conceptual and numerical models to represent the features, events and processes of a particular scenario and to simulate system performance for that scenario.

5. Parameter distributions that represent the possible change of the system over the long term.

6. Use of conservative assessments that lead to an overestimation of impacts.

7. Performance of sensitivity analyses.

8. Use of peer review and oversight.

DOE is confident that its approach to performance assessment addresses and compensates for various uncertainties, and provides a reasonable estimation of potential impacts associated with the ability of the repository to isolate waste over thousands of years.

**Response to DOE Response:**

While DOE believes it has adequately addressed the vast uncertainties inherent in this project, the agency cannot completely rule out the possibility of future seismic or volcanic activity near the proposed repository. Despite DOE’s assurances, earthquakes near Yucca Mountain in recent years have added to the lack of public confidence in DOE’s abilities to predict future events; the above comment by a Eureka County resident is an example of this sentiment.

**Comment:**

“Study the earthquakes that have happened in the past and are still happening at Yucca Mtn.”

*(Fay Ward, EIS000924/07)*
Based on the results of analyses reported in Chapter 5 of the EIS concerning the long-term performance of the repository, which considered the effects of future earthquakes and volcanic activity, DOE believes that a repository at Yucca Mountain would result in small short- and long-term environmental impacts. Concerning the adequacy of the descriptions and analyses in the EIS, Section 3.1.3 describes the geologic setting of Yucca Mountain and the surrounding region in great detail, including faults, seismicity, and the volcanic history of the region. Section 4.1.8 describes the likely impacts from accidents caused by earthquakes during operation of the repository. Several sections in Chapter 5 consider earthquakes and volcanic eruptions and their effects on the long-term performance of the repository. Some factual changes and clarifications that have been included in the Final EIS, and DOE believes that the EIS adequately describes and analyzes on the geology, geologic hazards, and the effects of these hazards on the repository.

As discussed in Section 3.1.3.3 of the EIS, DOE has been monitoring seismic activity and studying the geologic structure at and near Yucca Mountain since 1978. Using the results of these and other studies conducted in the Region, along with input from panels of recognized experts on seismic risks and hazards, surface facilities at the repository would be designed to withstand the effects of earthquakes that might occur during the lifetime of the facilities. The seismic design requirements for the repository specify that structures, systems, and components that are important to safety must be designed to withstand horizontal ground motion with an annual frequency of occurrence of once in 10,000 years. This is the equivalent of about a magnitude 6.3 earthquake with an epicenter within 5 kilometers (3 miles) of Yucca Mountain.

The 1992 earthquake at Little Skull Mountain 20 kilometers (12 miles) southeast of Yucca Mountain was the largest recorded earthquake within 50 kilometers (31 miles) of the proposed site of the repository. This earthquake, with a Richter magnitude of 5.6, did not damage facilities or structures at Yucca Mountain. It did, however, cause about $100,000 damage to buildings at the Field Operations Center in Jackass Flats about 2 kilometers (1.2 miles) from the epicenter (about 4 miles from the Exploratory Studies Facility). These old buildings were not constructed to the seismic design specifications that would be used for surface facilities at Yucca Mountain.

The State of Nevada ranks third, behind Alaska and California, in seismic activity. Nevada’s reputation as a seismically active state comes from major historic earthquakes in western and central Nevada with magnitudes of 7 or more on the Richter scale. This seismic belt may be an extension into Nevada of the Death Valley-Furnace Creek fault system in southeastern California. The average frequency of earthquakes of magnitude 6.0 to 6.9 in western Nevada has been about one every 10 years; earthquakes of magnitude 7 and greater average about one every 27 years. Yucca Mountain does not lie within this highly active seismic belt. Nevertheless, DOE estimated the impacts from extremely large and unlikely seismic events ("beyond design-basis") that could cause the waste-handling building to collapse and damage the pressurized-water reactor fuel assemblies. DOE concluded that the impacts from such an extreme event would be small because of the physical form of the fuel assemblies, protection by the building rubble, and the long distance to the nearest population.
The study reported in *Science* was prepared by Wernicke et al. ([DIRS 103485-1998](#)) and is discussed in Section 3.1.3.3 of the EIS. This study was based on measurements using a Global Positioning System over the period from 1991 to 1997 at five stations in the Yucca Mountain area. The authors claim that the crustal strain rates in the Yucca Mountain region are at least an order of magnitude higher than would be predicted from the Quaternary volcanic and tectonic history of the area. If higher strain rates exist, the authors suggest that the volcanic and seismic hazards at Yucca Mountain could be underestimated on the basis of the long-term geologic record.

In May 1998, scientists from the U.S. Geological Survey resurveyed the area using a network of 14 geodetic stations that was originally installed in 1983 ([DIRS 103458-Savage, Svarc, and Prescott 1998](#)). Two of the 14 stations were used by Wernicke et al. ([DIRS 103458-1998](#)) in their study. Based on the greater number of stations, the longer survey period (1983 to 1998), and the removal of the effects of the June 1992 Little Skull Mountain earthquake, the U.S. Geological Survey concluded that the strain rate in the Yucca Mountain region is about an order of magnitude lower than that reported by Wernicke et al. ([DIRS 103485-1998](#)). The results of the U.S. Geological Survey study are consistent with a large body of geological data that has been collected in the Yucca Mountain region during the past two decades.

Wernicke et al. ([DIRS 103485-1998](#)) also speculated that the high strain accumulation across the Yucca Mountain area could be driven by magmatic inflation at depth. They pointed to an early seismic study that hinted at the presence of a low-velocity zone beneath Crater Flat that could be consistent with basaltic magma ([DIRS 106447-Oliver, Ponce, and Hunter 1995](#)). A subsequent study demonstrated rather conclusively that there is no low-velocity zone under Crater Flat or Yucca Mountain that would suggest a major volcanic hazard ([DIRS 105358-Biasi 1996](#)).

Based on the subsequent investigations by the U.S. Geological Survey described above, DOE does not concur with the results reported by Wernicke et al. ([DIRS 103485-1998](#)). DOE is nevertheless continuing to monitor crustal strain in the Yucca Mountain region through a cooperative agreement with the University of Nevada. Dr. Wernicke, the principal investigator of this study, recently estimated in a quarterly report to the Yucca Mountain Project that conclusions should be available in 2002.

DOE acknowledges that it is not possible to predict with certainty what will occur thousands of years into the future. Section 5.2.4 of the EIS describes how DOE dealt with these uncertainties. The National Academy of Sciences, the Environmental Protection Agency, and the Nuclear Regulatory Commission also recognize the difficulty of predicting the behavior of complex natural and engineered barrier systems over long time periods. The Nuclear Regulatory Commission indicates that absolute proof is not to be had in the ordinary sense of the word (see 10 CFR Part 63), and the Environmental Protection Agency finds that reasonable expectation, which requires less than absolute proof, is the appropriate test of compliance (see 40 CFR Part 197).

DOE, consistent with recommendations of the National Academy of Sciences, has designed its performance assessment to be a combination of mathematical modeling, natural analogues, and the possibility of remedial action in the event of unforeseen events. Performance assessment
explicitly considers the spatial and temporal variability and inherent uncertainties in geologic, biologic and engineered components of the disposal system and relies on:

1. Results of extensive underground exploratory studies and investigations of the surface environment.

2. Consideration of features, events and processes that could affect repository performance over the long-term.

3. Evaluation of a range of scenarios, including the normal evolution of the disposal system under the expected thermal, hydrologic, chemical and mechanical conditions; altered conditions due to natural processes such as changes in climate; human intrusion or actions such as the use of water supply wells, irrigation of crops, exploratory drilling; and low probability events such as volcanoes, earthquakes, and nuclear criticality.

4. Development of alternative conceptual and numerical models to represent the features, events and processes of a particular scenario and to simulate system performance for that scenario.

5. Parameter distributions that represent the possible change of the system over the long term.

6. Use of conservative assessments that lead to an overestimation of impacts.

7. Performance of sensitivity analyses.

8. Use of peer review and oversight.

DOE is confident that its approach to assessing the long-term performance of the repository addresses and compensates for important uncertainties, and provides a reasonable estimation of potential impacts associated with the ability of the repository to isolate waste over thousands of years.

The proposed waste emplacement horizon at Yucca Mountain would be excavated in solid rock. Because vibratory ground motion decreases with depth, earthquakes would have much less affect on subsurface facilities than surface facilities. Inspection of tunnels in the Yucca Mountain area after earthquakes has revealed little evidence of disturbance. Furthermore, the proposed waste emplacement horizon is not near faults that could adversely affect the stability of the underground openings or act as pathways for water flow that could lead to radionuclide releases. Postemplacement seismic activity at Yucca Mountain would probably be along existing fault planes.

As described in Section 3.1.3 of the EIS, the most recent volcanic eruption in the area occurred between 70,000 and 90,000 years ago about 10 miles south of the Yucca Mountain site. The next-youngest eruptions were in Crater Flat west of Yucca Mountain where four northeast-trending cinder cones developed about 1 million years ago. A panel of experts examined the data, models, and related uncertainties, and concluded that the probability of a volcanic dike disrupting the repository during the first 10,000 years after closure is 1 in 7,000 (one chance in 70 million per year). This estimate was recalculated in Section 3.1.3.1 of the Final EIS to account for the current footprint of the proposed repository. The revised estimate increases to about 1
chance in 6,300 during the first 10,000 years with the current repository layout, considering both primary and contingency blocks (DIRS 151945-CRMS M&O 2000). Although extremely unlikely, a volcanic eruption through the repository could spread ash and entrained waste into the atmosphere and magma into the waste-emplacement drifts. DOE estimated the potential impacts to the nearest population, conservatively assuming the direction and speed of wind transport of an ash plume, and determined that the impacts to public health and safety would be very small. DOE also determined that magma flowing into the waste-emplacement drifts would have minimal impacts on the long-term performance of the repository.

As described in Chapter 5, during the first 10,000 years after closure of the repository, earthquake-induced shaking could dislodge rocks from the roof of the emplacement drifts. The likelihood of falling rocks splitting open a waste package is essentially zero because waste packages would be protected by titanium drip shields. Even if a drip shield were ruptured by falling rocks, the force and impact would be absorbed by the drip shield and not transferred completely to the waste package. Furthermore, the metal walls of the waste package itself would be designed to withstand the impact from falling rocks.

Response to DOE Response:
While DOE believes it has adequately addressed the vast uncertainties inherent in this project, the agency cannot completely rule out the possibility of future seismic or volcanic activity near the proposed repository. Nor can DOE rule out the possibility that such an occurrence near the repository would lead to radioactive contamination of the surrounding environment. Despite DOE’s assurances, earthquakes near Yucca Mountain in recent years have added to the lack of public confidence in DOE’s abilities to predict future events; the above comment by a Eureka County resident is an example of this sentiment.

9. No-Action Alternative

Comment:
Many Eureka County residents commented on the fact that the No Action Alternatives described in the Draft EIS are not reasonable. Eureka County residents believed that “the EIS should have a reasonable no action alternative.”

One commenter stated, “…please consider – in a revised DEIS – a national no action alternative. Why not leave the waste where it is and devote/re-designate the money to research safe disposal of this waste?” (Susan Fye, EIS001156/08)

DOE Response 3.2 (64):
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 alternative sites to Yucca Mountain (see Section 1.5 of the EIS). 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 was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository, the development of new technologies, or reconsideration of alternatives to geologic disposal. One such possibility, the proposed Private Fuel Storage Facility for commercial spent nuclear fuel on the Reservation of the Skull Valley Band of Goshute Indians, is proceeding through the Nuclear Regulatory Commission’s licensing process for the construction and operation of an independent spent fuel storage installation. The Nuclear Regulatory Commission has issued a Draft EIS and Safety Evaluation Report concerning the Private Fuel Storage Facility, and has conducted other licensing-related actions such as evidentiary hearing. The Nuclear Regulatory Commission has yet to issue a Final EIS or a decision on whether to grant a license. The cumulative transportation impacts of these and other reasonably foreseeable actions were included in Section 8.4 of the Final EIS.

However, in light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios—long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years, and long-term storage with no effective institutional control after about 100 years. Although neither of these scenarios is likely, DOE selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur. For example, the impacts associated with the first 100 years of effective institutional control (Scenario 1 or 2
of the No-Action Alternative) enable direct comparison to the impacts of the Proposed Action during the first 100 years after the repository was closed.

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 EIS). 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.

Response to DOE Response:
The evaluation of alternatives, according to NEPA, “is the heart of the environmental impact statement” and serves an important purpose in “sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public (40 CFR 1502.14).” Members of the public, including many residents of Eureka County, have repeatedly voiced their concern that DOE has not fulfilled its responsibilities regarding this aspect of the environmental analyses process. However, despite both these objections and NEPA’s directive to “[r]igorously
explore and objectively evaluate all reasonable alternatives (40 CFR 1502.14(a)).” DOE has chosen in the Final EIS not to revise or make additions to the unsatisfactory alternatives analyzed in the Draft EIS.

Members of the public have asked that a reasonable alternative to the Proposed Action be analyzed in the EIS. Of its two chosen no-action alternatives, DOE admits in the above statement that “neither one of these scenarios is likely,” but proceeds nevertheless to defend them as adequate. This is unresponsive to the requests of the commenters. If these alternatives are unlikely to ever be seriously considered, then they cannot fall under the definition of reasonable, as given by the Council on Environmental Quality. According to the CEQ, reasonable alternatives are “practical or feasible from the technical and economic standpoint,” and employ “common sense (Forty Questions No. 2(a)).”

Instead of identifying and analyzing reasonable alternatives, DOE has chosen to take refuge in the Nuclear Waste Policy Act, which while not directing DOE to analyze alternatives other than geologic disposal at Yucca Mountain, does not specifically prevent it. The NWPA does, however, direct DOE to prepare an EIS in accordance with NEPA regulations. And in order to most fully comply with NEPA, scenarios representing the “full spectrum” of alternatives to the Proposed Action must be evaluated (Forty Questions No. 1(b)). The Council on Environmental Quality even goes so far as to address the conflicts with legislation such as the NWPA that may arise: “[a]lternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA’s goals and policies. (Forty Questions No. 2(b)).”

By not presenting a range of options with which to compare the Yucca Mountain site, DOE has rendered the NEPA process hollow. Without a single reasonable alternative to consider, decisionmakers and the public alike are robbed of the benchmark that would most accurately reveal both the advantages and shortcomings of the proposed Yucca Mountain repository.

Comment:
On the subject of alternatives to the Yucca Mountain repository, Eureka County resident Carrie Dann stated the following:

“The selection and evaluation of alternatives to the proposed action are, without a doubt, the most critical aspects of the environmental review process codified by Congress in the National Environmental Policy Act (NEPA). The CEQ Guidelines state quite unequivocally, that this “section is the heart of the environmental impact statement.” (40 CFR 1502.14). In order to live up to NEPA’s mandate the decision-maker, as well as the public, must be presented with “the environmental impacts of the proposal and the alternatives in comparative form,” thus “sharply defining the issues and providing a clear basis for choice.” (Id.). Under NEPA, agencies are directed to, inter alia:
a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
c) Include reasonable alternatives not within the jurisdiction of the lead agency…

(Id.). Agencies are mandated under NEPA to follow these procedures in order to sharply define the issues and provide a sound basis for the decision-maker to choose among the available options. Without strict adherence to the duties mandated, the environmental review process is left impotent and emasculated. A far cry indeed, from the laudable goal of “assur(ing) for all Americans’ safe, healthful, productive, and aesthetically and culturally pleasing surroundings…” (NEPA, 101).

“It appears that for the purposes of Yucca Mountain, DOE has seen fit to cut out the very heart of NEPA. This is especially alarming in that this project has, perhaps more than any other, the potential for the most devastating environmental impacts ever conceived. How can DOE claim to be working in the best interests of the nation, while simultaneously failing to abide by the “will of the people” as expressed in NEPA. Note that the 1987 amendments do not prevent the DOE from evaluating alternatives, they merely exempt them from fulfilling these aspects of NEPA. It is DOE’s choice to not address these issues. DOE now hopes to erect the façade of NEPA compliance in order to complete the deception first begun at the dawn of the Nuclear Age.” (Carrie Dann, EIS001965/12)

“DOE deception is two-fold in this process; first, reasonable alternatives are completely ignored, and second, unreasonable alternatives are presented as the no-action alternatives. As to the latter, the DEIS states that “these two scenarios were chosen for analysis because they provide a baseline for comparison to the Proposed Action and they reflect a range of the impacts that could occur.” (DEIS at 2-60). While the establishment of baselines is indeed necessary, if they are completely unrealistic they adversely impact the decision-making process. Instead of deciding between the proposed action, a range of reasonable alternatives, and a realistic no-action alternative, the decision-maker is left with an either/or situation. And either/or situation compounded by the fact that the only alternative to the proposed action is presented in such a way as to make its choice impossible. Again, DOE appears to be actively engaged in a campaign of misinformation and deceit.

“The DEIS speaks of “effective institutional control” and “no effective institutional control,” both of which represent extreme ends of a spectrum. By presenting the no-action alternative (i.e. the not at Yucca Mountain scenario) in such a way, the decision-maker is unable to make an informed decision. We would recommend that the DEIS evaluate realistic and meaningful scenarios, rather than continue to waste our time and energies on “straw alternatives” and eviscerated environmental reviews.

“By allowing the decision-maker to consider this project only in isolation, without consideration of reasonable alternatives, and without a realistic baseline from which to examine the letter as
well as the spirit of the law, DOE has effectively defrauded the entire country.” (Carrie Dann, EIS001965/13)

Another comment related to the NEPA process was given by Christopher Sewell, “Perhaps more importantly is the lack of alternatives in this document. The very heart or essence of the NEPA process is the evaluation of alternatives to the project at hand. That’s the very heart of the NEPA process. The whole substance of the NEPA process is evaluating the different possibilities, different alternatives for the project at hand.”

“And instead, instead we get two alternatives. We get we can build the dump or the no action alternative. And I’d like to point out that the no action alternative should be a reasonable alternative, and right now the no action alternative that we have been presented [with] in this document is completely unreasonable, and in fact, I don’t know of anybody advocating for the scenario that you have put in the no action alternative. Nobody is saying leave the waste at the site for a thousand years, 10,000 years unmonitored. Nobody is saying that. Nobody in the antinuclear movement, nobody is saying that. So why are you evaluating [it] there? It is a straw man. You knock it down. So we have an alternative that we couldn’t possibly choose or the dump. That’s ridiculous.” (Christopher Sewell, EIS000638/03)

DOE responded to both comments with the following statement.

DOE Response 3.2 (51):
The NWPA [Sections 114(f)(2) and (3)] provides that DOE need not consider in the EIS the need for a geologic repository or alternatives 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 Commercially 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. That EIS evaluated mined geologic disposal, very deep hole waste disposal, mined cavity disposal from rock melting, island-based geologic disposal, subseabed disposal, ice sheet disposal, well injection disposal, transmutation, and space disposal. In its Record of Decision (46 FR 26677, May 14, 1981), DOE announced its decision to pursue mined geologic disposal repositories.

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 NWPA, 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 the commercial utilities would take if Yucca Mountain was not approved remains uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository, the development of new technologies, or reconsideration of alternatives to geologic disposal. One such possibility, the proposed Private Fuel Storage Facility for commercial spent nuclear fuel on the Reservation of the Skull Valley Band of Goshute Indians, is proceeding through the Nuclear Regulatory Commission’s licensing process for the construction and operation of an independent spent fuel storage installation. The Nuclear Regulatory Commission has issued a Draft EIS and a Safety Evaluation Report concerning the Private Fuel Storage Facility, and has conducted other licensing-related actions such as evidentiary hearings. The Nuclear Regulatory Commission has yet to issue a Final EIS or a decision on whether to grant a license. The cumulative impacts of these and other reasonably foreseeable actions are included in Section 8.4 of the EIS.

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the No-Action analysis on the potential impacts of two scenarios – long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years, and long-term storage with no effective institutional control after about 100 years. Although neither of these scenarios would be likely, DOE selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of impacts that could occur.

DOE believes that the EIS adequately analyzes the potential 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.

Response to DOE Response:
As evidenced by the above Eureka County commenters, the public has ardently voiced concern that DOE has not fulfilled its responsibilities regarding the evaluation of alternatives in the Yucca Mountain EIS. However, despite both these objections and NEPA’s directive to “[r]igorously explore and objectively evaluate all reasonable alternatives (40 CFR 1502.14(a)),”
DOE has chosen in the Final EIS not to revise or make additions to the unsatisfactory alternatives analyzed in the Draft EIS.

Members of the public have asked that a reasonable alternative to the Proposed Action be analyzed in the EIS. Of its two chosen no-action alternatives, DOE admits in the above statement that “neither one of these scenarios is likely,” but proceeds nevertheless to defend them as adequate. This is unresponsive to the requests of the commenters. If these alternatives are unlikely to ever be seriously considered, then they cannot fall under the definition of reasonable, as given by the Council on Environmental Quality. According to CEQ, reasonable alternatives are “practical or feasible from the technical and economic standpoint,” and employ “common sense (Forty Questions No. 2(a)).”

Instead of identifying and analyzing reasonable alternatives, DOE has chosen to take refuge in the Nuclear Waste Policy Act, which while not directing DOE to analyze alternatives other than geologic disposal at Yucca Mountain, does not specifically prevent it. The NWPA does, however, direct DOE to prepare an EIS in accordance with NEPA regulations. In order to most fully comply with NEPA, scenarios representing the “full spectrum” of alternatives to the Proposed Action must be evaluated (Forty Questions No. 1(b)). The Council on Environmental Quality even addresses the conflicts with legislation such as the NWPA that may arise: “[a]lternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA’s goals and policies. (Forty Questions No. 2(b)).”

By not presenting a range of options with which to compare the Yucca Mountain site, DOE has rendered the NEPA process hollow. Without a single reasonable alternative to consider, decisionmakers and the public alike are robbed of the benchmark that would most accurately reveal both the advantages and shortcomings of the proposed Yucca Mountain repository.

Comment:
“…I feel that the EIS is inadequate on the subject of a no action scenario. Both one and two are unreasonable.” (Lee Louden, EIS000621/10)

DOE Response 9.1 (138):
DOE analyzed the No-Action Alternative to serve as a basis for comparing the magnitude of potential environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. In addition, DOE would prepare a report to Congress, with the Department’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 was not approved is uncertain.

DOE recognizes that a number of possibilities could be pursued, including continued storage of spent nuclear fuel and high-level radioactive waste at existing sites and/or one or more centralized locations, study and selection of another location for a deep geologic repository (Chapter 1 identifies the process and alternative sites previously selected by DOE for technical study as potential repository locations), the development of new technologies (for example, transmutation), or reconsideration of alternatives to geologic disposal. The environmental considerations of these possibilities have been analyzed in other contexts in other documents to varying degrees.

The No-Action Alternative did not consider redistribution or centralizing of spent nuclear fuel. However, the introduction to Chapter 7 of the EIS lists several references to documents that have evaluated potential environmental impacts of away-from-reactor spent nuclear fuel consolidation facilities. In addition, because the Department believes that it is a reasonably foreseeable future action although still uncertain, the Final EIS includes an evaluation of potential cumulative transportation impacts associated with the shipment of 40,000 metric tons of heavy metal (MTHM) of commercial spent nuclear fuel to a proposed privately owned centralized storage facility at Skull Valley in Utah (see Chapter 7 and Section 8.4 for details).

In light of these uncertainties, DOE decided to illustrate the possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios—long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years (Scenario 1), and long-term storage with no effective institutional control after about 100 years (Scenario 2). Although the Department agrees that neither of these scenarios is likely, it selected them for analysis because they provide a basis for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur.

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 of the EIS 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. The Department believes that the avoidance of overstatement of impacts is the conservative approach for evaluation of potential impacts from the No-Action Alternative. Section K.4 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 Section K.4.4 of the EIS, DOE acknowledges that the No-Action Alternative impacts presented in Chapter 7 and Appendix K could be much larger or smaller than those estimated for the EIS. DOE believes that these estimates (with their uncertainties) adequately describe the potential environmental impacts that could occur from continued storage of high-level
radioactive waste and spent nuclear fuel at or near existing facilities, and are valuable to the decisionmaking process.

Chapter 7 and Appendix K of the EIS provide information related to the No-Action Alternative. In addition, the 16 references cited in the No-Action impact analysis provide additional detailed information.

DOE analyzed five "regionalized" sites based on regional environmental parameters. DOE selected and weighted these parameters based on each site’s potential for human health impacts (that is, inventory, facility failure rates, canister corrosion rates, surface-water pathways to humans, and downstream populations). DOE evaluated site-specific environmental conditions, such as freeze-thaw cycles, precipitation frequency and quantities, precipitation chemistry, and relative humidity, at the 77 storage locations to determine failure times for the primary weather protection barriers (see Section K.2.1.1 of the EIS). For above-ground concrete storage facilities, these failure times ranged from fewer than 75 years for areas with many freeze-thaw cycles and abundant precipitation, such as the Northeast, to more than 600 years in dry, warm areas, such as the desert Southwest. For the below-grade storage facilities (such as those at the Savannah River Site and Hanford), the Department assumed that the primary weather protection would fail at 50 years after maintenance ended because, unlike the reinforced concrete structures used in above-ground facilities, the below-grade facilities use sheet-metal buildings. Release of radioactive materials would not begin with the loss of weather protection but only after the weather protection was lost and the storage canister and or cladding failed (see Section K.2.1). In addition, DOE gathered operational data obtained from facilities currently in operation or planned for the near future (see Appendix K of the EIS). The analysis constructed and evaluated the five hypothetical sites in a manner such that the total collective impacts estimated for a given region would be essentially equal to those that would have been estimated using individual, site-specific analyses.

Because the potential value of spent nuclear fuel and high-level radioactive waste would be the same under the Proposed Action and the No-Action Alternative, DOE does not consider it to be an important discriminator in the decisionmaking process and, therefore, did not include the value in either analysis.

Response to DOE Response:
Commenting on the Draft EIS, the above Eureka County resident expressed concern over the lack of reasonable alternatives analyzed in the document. However, instead of addressing this comment and others like it by including an analysis of a more reasonable alternative in the Final EIS, DOE has merely defended the alternatives previously analyzed. DOE has again cited the exemptions provided in the Nuclear Waste Policy Act and stated its intention to adhere to these exemptions, even at the expense of a more thorough and legitimate NEPA analysis.

The evaluation of alternatives, according to NEPA, “is the heart of the environmental impact statement” and serves an important purpose in “sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public (40 CFR 1502.14).” By not presenting a range of options with which to compare the Yucca Mountain site, DOE has rendered the NEPA process hollow. Without a reasonable alternative to consider, decisionmakers and the
public alike are robbed of the benchmark that would most accurately reveal both the advantages and shortcomings of the proposed Yucca Mountain repository.

10. Cumulative Impacts

Comment:
“My questions earlier about exposure, accumulative exposure. If this panel cannot address them, then I think that’s extremely important. If we have rules and regulations for transporting materials that specify they need to be moved in 48 hours, then why isn’t this addressed in this book more adequately so that our questions can be answered?

“We’re talking about materials that are extremely deadly, and all of us are very concerned and want factual information. We want to know about cumulative effects. People who live along rail lines and have herds and growth materials, farms, who raise alfalfa and family foods, people who go out and harvest natural medicines and so forth need this kind of information.” (Jennifer Olaranna Viereck, EIS000622/10)

DOE Response 8.11.7 (2226):
Section 8.4 of the EIS presents the past, present, and reasonably foreseeable future actions that would be additive to actions related to the transportation of spent nuclear fuel and high-level radioactive waste to a proposed repository. These actions include activities of the Nevada Test Site, Nellis Air Force Base, management of low-level radioactive waste, Native American activities, other DOE waste management, and regional mining activities and enterprises, among others. For each action, the Department has presented the radiological impacts and vehicular accident impacts. There would be no cumulative effect of radiation on crops and farm animals grown in the vicinity of the transport routes since no radioactive material would be released from the cask during incident free transportation.

Response to DOE Response:
While DOE has adequately analyzed the cumulative impacts from incident-free transportation in the Final EIS, Section 8.4 does not include any analysis of cumulative impacts resulting from an accident in which radioactive material is released. Such an accident is within the realm of reasonably foreseeable possibilities (p. J-50). The cumulative impacts of such an accident must therefore be analyzed.

Additionally, DOE has identified non-radiological cumulative impacts that could occur along the Carlin route. These include land-use impacts resulting from activities of the Cortez Gold Mine, Inc., impacts from the increased traffic of a shared use rail line, as well as cultural impacts to Native American archeological sites. DOE must propose specific, feasible mitigation measures to address these impacts at this time.

Comment:
On military air space impacts: “Also absent from the EIS was an adequate analysis of the cumulative impacts and the potential conflicts between military air space practice areas, the ranges to the south, and the rail route.” (Pete Goicoechea, EIS000630/09)
DOE Response 10 (1792):
Section J.3.3 in the EIS describes the scenarios considered in the evaluation of transportation accidents, which included military airspace operated by the U.S. Air Force.

Response to DOE Response:
Section J.3.3 of the EIS concludes that an aircraft crash would not be able to perforate or crack a cask. However, a fire resulting from this kind of accident could cause a cask seal failure, resulting in a release of radioactivity into the environment (p. J-8). Cumulative impacts from rail line shipments and military airspace activities were not examined in this portion of the Final EIS.

Comment:
“There is also no cumulative figures that I could find regarding the fact that this is being built adjacent to the Nevada Nuclear Test Site. The Nevada Nuclear Test Site is already exposing everyone in the area through the air, through soils that blow around in high level winds, through the water, and there’s not information about how this would cumulatively affect people in terms of genetics, natural wildlife or human health. I think this is inadequate and needs to be addressed with a lot more concern.” (Jennifer Olaranna Viereck, EIS000622/11)

DOE Response 10 (2227):
Table 8-1 of the EIS lists the past, present, and reasonably foreseeable actions that DOE analyzed in Sections 8.2, 8.3, and 8.4 for cumulative impacts. Activities at the Nevada Test Site that would affect the cumulative impact analyses included past nuclear weapons testing; treatment, storage, and disposal of low-level radioactive waste, mixed waste, transuranic waste, high-level radioactive waste, and hazardous waste; construction and operation of an intermodal transfer station near Caliente for the shipment of low-level radioactive waste to the Nevada Test Site; historic shipments of radioactive materials to and from the Nevada Test Site for other DOE facilities; and possible future shipments of radioactive materials to the Nevada Test Site. DOE believes that it has considered all past, present, and reasonably foreseeable actions on the Nevada Test Site in the cumulative impact analyses in Chapter 8.

Response to DOE Response:
While DOE has expanded its discussion of cumulative impacts relating to past activities at the Nevada Test Site, it has yet to propose adequate means of mitigating these impacts. DOE must disclose specific, feasible mitigation measures at this time.

11. References


This report was prepared by Sarah Walker for Abigail C. Johnson Consulting and the Eureka County Board of Commissioners, fall 2003.

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