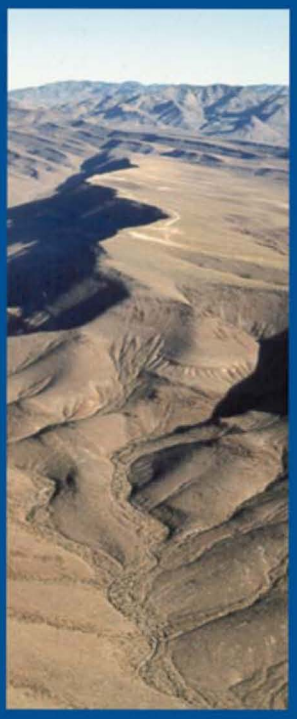

Final

Supplemental Environmental Impact Statement

for a

Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada

Volume III
Comment-Response Document

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

DOE/EIS-0250F-S1

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Introduction

INTRODUCTION

Background

This volume of the Yucca Mountain Repository Final Supplemental Environmental Impact Statement (Repository SEIS) consists of responses to comments the U.S. Department of Energy (DOE, or the Department) received on the Draft Repository SEIS. DOE prepared this SEIS consistent with the Nuclear Waste Policy Act, as amended (NWPA; 42 U.S.C. 10101 et seq.), the Council on Environmental Quality (CEQ) regulations that implement the National Environmental Policy Act (NEPA) (40 CFR Parts 1500 to 1508), and the Department's procedures for implementation of NEPA (10 CFR Part 1021), as applicable.

The following paragraphs describe the public comment and related processes.

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

DOE issued the *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250F-S1D) in October 2007 for public comment. The Department announced the availability of the Draft Repository SEIS for public review and comment in the Federal Register on October 12, 2007 (72 FR 58071); this announcement began a 90-day comment period, which ended on January 10, 2008. At the same time, DOE issued the *Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor* (DOE/EIS-0250F-S2D; the Nevada Rail Corridor SEIS) and the *Draft Environmental Impact Statement for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0369D; the Rail Alignment EIS).

The Repository SEIS evaluates the potential preclosure and postclosure impacts of constructing and operating the Yucca Mountain repository, and the environmental impacts of national transportation of spent nuclear fuel and high-level radioactive waste.

The Nevada Rail Corridor SEIS and Rail Alignment EIS evaluate the potential environmental impacts of constructing and operating a railroad for shipments of spent nuclear fuel and high-level radioactive waste from an existing rail line in Nevada to the repository at Yucca Mountain to help the Department decide whether to construct and operate a railroad, and if so, within which corridor and along which alignment.

This Comment-Response Document is associated with this Repository SEIS. Each of the other NEPA analyses has its own Comment-Response Document. DOE received some comments that apply to more than one of the analyses. The Department repeated such comments and the DOE responses in each applicable Comment-Response Document.

The October 12, 2007, DOE Notice of Availability (72 FR 58071) invited commenters to submit their comments on the three NEPA analyses by regular mail, facsimile transmission (faxes), electronic mail (e-mail), and at public hearings at eight locations:

- Hawthorne, Nevada – November 13, 2007
- Caliente, Nevada – November 15, 2007
- Reno/Sparks, Nevada – November 19, 2007
- Amargosa Valley, Nevada – November 26, 2007

- Goldfield, Nevada – November 27, 2007
- Lone Pine, California – November 29, 2007
- Las Vegas, Nevada – December 3, 2007
- Washington, D.C. – December 5, 2007

In addition, on November 27, 2007, DOE held a meeting with representatives of American Indian tribes and organizations to solicit their comments.

DOE received more than 3,900 comments on the NEPA documents from federal agencies; state, local, and tribal governments; public and private organizations; and individuals. These comments were in statements transcribed by a court reporter at the American Indian meeting and at the public hearings (the statement of each speaker is a separate comment document), or in written documents submitted at those hearings or sent to DOE by regular mail, e-mail, and fax.

Although the closing date of the public comment period was January 10, 2008, DOE was able to process all comments that it received and to prepare responses for inclusion in the three Comment-Response Documents.

As part of this Final Repository SEIS, DOE has included compact disks that contain electronic images of the certified transcripts of the American Indian meeting and all public hearings held during the public comment period on the Draft SEIS. These compact disks also contain electronic images of all comment documents (including transcripts for each commenter at the public hearings) that DOE received on the Draft Repository SEIS; these images include brackets that identify the comments to which DOE has responded in this Comment-Response Document. In addition, DOE has placed this material on the Internet site for the proposed Yucca Mountain Repository (www.ymp.gov). Tables CR-1 and CR-2 (at the end of this Introduction) provide pointers to all comments received from organizations and individuals, respectively. These tables point to the locations in this Comment-Response Document where the reader can find particular comments and the DOE responses. On several occasions, speakers at public hearings represented other individuals. In such cases, the tables list the person who spoke at the hearing. Table CR-3 is a cross-reference from the comments and responses back to the commenter(s); it identifies who made each comment and, for summary comments, the group of commenters.

HOW DOE CONSIDERED PUBLIC COMMENTS

DOE assessed and considered public comments on the Draft Repository SEIS, both individually and collectively. Some comments led to SEIS modifications; others resulted in a response to explain DOE policy, to refer readers to information in the SEIS (or to the Nevada Rail Corridor SEIS or Rail Alignment EIS), to answer technical questions, to explain technical issues, to correct reader misinterpretations, or to provide clarification.

A number of comments provided valuable suggestions on improving the Repository SEIS. As applicable, the responses in this volume identify changes that DOE made to the SEIS as a result of comments.

Methodology

Because of the large number of submittals (letters, e-mails, faxes, comment forms, public hearing transcripts) that DOE received on the Draft Repository SEIS, the Department elected to extract and categorize comments and, as appropriate, group the same or similar comments for response. This

approach enabled the Department to consider, individually and collectively, all comments it received on the Draft SEIS in an efficient manner, and to respond to those comments.

The following list highlights key aspects of the DOE approach to capturing, tracking, and responding to public comments on the Draft Repository SEIS:

- DOE read all comment documents and their attachments to identify and extract comments. As a part of this process, DOE reviewed technical attachments (for example, reports) for potential applicability to the SEIS. After comment identification, DOE grouped individual comments by categories and assigned each comment to an expert in the appropriate discipline to prepare a response. Senior-level experts reviewed each response to ensure technical and scientific accuracy, clarity, and consistency, and to ensure that the response addressed the comment.

- Frequently, more than one commenter submitted identical or similar comments. In such cases, DOE grouped the comments and prepared a single summary response for each group. Summarizing comments was appropriate because of the large number of similar comments received.

- To the extent practicable, DOE presented the comments in this document by topic. Each comment-response pair, individual or summary, consists of three parts: (1) information on the source of the comment, including the number of the submitted comment document and the comment number, or for summary comments, the number of comments summarized, (2) the individual or summary comment, and (3) the response.

- To the extent practicable, this Comment-Response Document presents the comments extracted from comment documents as stated by the commenters (see next bullet). In some cases, however, DOE paraphrased individual comments to capture their meaning if they were general in nature (for example, for or against an activity or action), if they indicated something was incomplete or insufficient but did not provide specific examples (for example, "cumulative impacts are inadequate"), or if they indicated something was not safe (for example, transportation of spent nuclear fuel) but provided no specific information. Comments grouped and summarized for response are, of necessity, paraphrased, but DOE made every effort to capture the essence of every comment included in a comment summary.

- DOE did not modify certified transcripts of public hearings. However, some transcripts (and letters, e-mails, and faxes) contained obvious errors (for example, misspelled names or words). For this Comment-Response Document, DOE corrected such errors in the extracted comments. Similarly, DOE deleted extraneous material (such as repeated words) from extracted comments whenever such a deletion would not alter the meaning of the comment. The compact disk included with this Final EIS contains an image of the text of each hearing transcript as certified by the court reporter.

- If the meaning of a comment was not clear, DOE made a reasonable attempt to interpret the comment and respond based on that interpretation.

- Some commenters incorporated comments by reference to other documents. DOE handled such comments in one of three ways: (1) For a comment submitted under a separate process that was complete, which includes scoping for the three NEPA documents under consideration, DOE did not provide a response because it had already considered the matter. (2) For a comment submitted under a separate process that was not complete (for example, an environmental assessment on repository infrastructure), DOE considered changed circumstances and responded by discussing in general what it had done. (3) For comments submitted previously and submitted again under the current process with additional information, DOE responded to the current comment and reevaluated the earlier submittal.

- Due to their overarching interest, DOE determined that it would repeat some comments in the Comment-Response Documents for two or all three of the EISs it issued for public review. In addition, DOE determined that some comments it received for one of the EISs were more suited for response in another document (for example, some comments on the rail corridor or alignment fit better in the Repository SEIS); in these cases, the Department provided its response in the appropriate Comment-Response Document and repeated it in the Comment-Response Document for the EIS to which the commenter originally referred.

Key Issues Raised in Comments

The purpose of this Repository SEIS is to assess potential impacts from the Proposed Action – to construct, operate, monitor, and eventually close a geologic repository at Yucca Mountain – to provide the necessary background, data, and analyses to help decisionmakers and the public understand the potential environmental impacts.

This section provides summaries of a variety of key issues raised by commenters (presented in italics) during the public comment process for the Draft Repository SEIS. It also provides DOE responses to those key issues. DOE identified the issues as "key" based on factors such as:

- The extent to which an issue concerned fundamental aspects of the Proposed Action
- The nature of the comments as characterized by the commenters
- The extent to which DOE changed the SEIS in response to the issue

The main body of this Comment-Response Document contains all the comments DOE received on the Draft Repository SEIS, and the DOE responses to those comments. DOE encourages readers to review the specific comments and DOE responses for particular areas of interest.

I. REPOSITORY DESIGN AND OPERATIONAL DETAILS

The design and operational details of the Proposed Action in the Repository SEIS are insufficient to allow an adequate and meaningful NEPA evaluation.

The suggestion that DOE must await the availability of additional, more detailed design and operational details is not consistent with the requirements of NEPA and CEQ regulations. DOE has used the best available information in this Repository SEIS to provide an analysis of the potential reasonably foreseeable environmental impacts of the Proposed Action. The policies and procedures of DOE and the CEQ that implement the requirements of NEPA call for

environmental impact analyses early in the process of development of a proposed federal project. In particular, CEQ regulations (40 CFR 1500.5, 1501.2, 1502.5, and 1508.23) stress the need to prepare an EIS early in the process. In addition, there are processes for determining if there is a need for additional NEPA analyses if an agency proposes substantial changes to a proposed action, or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

This information is sufficient to perform an adequate and meaningful evaluation of the proposed project.

II. ENVIRONMENTAL PROTECTION AGENCY AND NUCLEAR REGULATORY COMMISSION FINAL REGULATIONS

DOE should not issue the Final Repository SEIS until both the EPA regulation and the conforming NRC licensing regulation are in final form concerning the individual radiation protection standard for the post-10,000-year period at Yucca Mountain. DOE should then redraft the SEIS to comply with these regulations once they are finalized. The Final SEIS must use the same Total System Performance Assessment (TSPA) model to calculate long-term repository performance as that used for the License Application in order for the NRC to be able to adopt the Final Repository SEIS. The DOE TSPA for the Draft Repository SEIS is markedly different from that used in the 2002 Yucca Mountain FEIS, and DOE is continuing to modify it for use in its license application to the NRC.

The Repository SEIS analyzes repository performance in the context of the proposed EPA and NRC regulations to provide a perspective on the potential radiological impacts of the repository during the period of geologic stability (as long as 1 million years). If the Repository SEIS postclosure analysis is inconsistent with any requirement of the final EPA or NRC regulation, the Department would perform any required additional analysis.

DOE has continued to refine the TSPA model since it completed the 2002 Yucca Mountain FEIS. The differences in the results of the TSPA analyses in the Final Repository SEIS and the FEIS are largely attributable to the proposed EPA and NRC regulations, which were issued after 2002. The proposed regulations set forth requirements on how to calculate repository performance during the period of geologic stability, and requirements concerning the use of health physics information that is more current than that required in the 2001 NRC rule (see Chapter 5 of the SEIS). The version of the TSPA model that DOE used in this Repository SEIS to estimate potential postclosure radiological impacts is the same version used in DOE's application for construction authorization.

III. WATER APPROPRIATIONS

The State of Nevada has been resistant to issuing water permits for the Yucca Mountain Project.

As with any major construction project, the building and operation of the repository would require an adequate supply of water. This water would be necessary for construction materials such as concrete, for control of dust, and for emergency use such as fire suppression. DOE submitted its application for the necessary water to the State of Nevada in 1997. The state denied the application in 2000 on the basis of state law, and the matter is currently the subject of litigation pending in the Federal District Court in Nevada. The Department will continue to

pursue the litigation, which the District Court has stayed, and to work with the state to obtain the water necessary to support the repository program.

IV. SABOTAGE AND TERRORISM

The consideration of terrorist attacks is incomplete and requires additional analysis.

Whether acts of sabotage or terrorism would occur, and the exact nature and location of such events or the magnitude of the consequences of such acts if they were to occur, is inherently uncertain—the possibilities are infinite. Nevertheless, DOE took a hard look at the consequences of potential acts of sabotage or terrorism at the repository and during the transport of spent nuclear fuel and high-level radioactive waste by evaluating two fundamentally different scenarios: one involving aircraft and one involving a weapon or device that struck a transportation cask loaded with commercial spent nuclear fuel. DOE estimated the consequences of these scenarios without regard to their probability of occurrence; that is, DOE assumed the scenarios would occur and under conditions that would reasonably maximize the consequences.

As with any aspect of environmental impact analysis, it is always possible to postulate scenarios that could produce higher consequences than previous estimates. In eliminating the requirement that agencies conduct a worst-case analysis, the CEQ has pointed out that "one can always conjure up a worse 'worst case'" by adding more variables to a hypothetical event, and that "'worst case analysis' is an unproductive and ineffective method … one which can breed endless hypothesis and speculation." As indicated in the CEQ regulations that implement NEPA, an agency has a responsibility to address reasonably foreseeable significant adverse effects. The evaluation of impacts is subject to a "rule of reason" ensuring analysis based on credible scientific evidence useful to the decisionmaking process. In applying the rule of reason, an agency does not need to address remote and highly speculative consequences in its EIS.

Since the terrorist attacks of September 11, 2001, the NRC has issued safeguards advisories and orders to enhance the security of spent nuclear fuel transportation and shipments of large quantities of radioactive material. Enhancements include more preplanning and coordination with affected states, additional advance notification of shipments, additional control and monitoring, trustworthiness checks for individuals who have access to a shipment or information about a shipment, and more stringent security measures for shipment routes and schedules. In addition, the NRC issued orders that require enhanced security measures for spent nuclear fuel shipments from reactors.

Crash of a commercial jetliner into surface facilities is not a substitute for a thorough review of the potential impacts of sabotage or terrorism.

The Repository SEIS presents the potential impacts for a scenario that would approximate the consequences of a major sabotage event, in which a large commercial aircraft filled with jet fuel would crash into and penetrate the repository facility with the largest inventory of radioactive material vulnerable to damage from such an event.

As discussed in the Repository SEIS, DOE has analyzed plausible threat scenarios, required enhanced security measures to protect against these threats, and developed emergency planning requirements that would mitigate potential consequences. Further, the safeguards applied to the proposed repository should involve a dynamic process of enhancement to meet threats, which could change over time. Repository planning activities will include a continuing effort to identify

safeguards and security measures that would further protect fixed facilities from terrorist attack and other forms intentional destructive acts.

Failure to address the potential for a nuclear criticality during a terrorist attack.

The presence of water could increase the likelihood of criticality. Therefore, spent nuclear fuel shipping casks are specifically designed to remain subcritical, even when filled with water. It is highly unlikely that a terrorist event would cause the contents of a shipping cask to achieve a nuclear criticality, even if the event disrupted the contents of the cask.

V. GLOBAL NUCLEAR ENERGY PARTNERSHIP INVENTORY

Explain the relationship between the proposed repository and the Department's Global Energy Partnership (GNEP) program.

Since the issuance of the Draft Repository SEIS, DOE has been engaged in further defining the programmatic and project-specific alternatives that the Department will evaluate in the Global Nuclear Energy Partnership Programmatic EIS. The purpose of GNEP, which is a domestic and international program, is to support worldwide expansion of nuclear energy production while advancing nonproliferation goals and reducing the impacts of spent nuclear fuel disposal.

The programmatic alternatives DOE will consider in the GNEP Programmatic EIS vary by reactor and fuel type, and by whether they would incorporate recycling of commercial spent nuclear fuel to recover usable materials for reuse in reactor fuels. Depending on the programmatic alternative, the resultant radiological materials requiring geologic disposal could range from only high-level radioactive waste from the recycling of spent nuclear fuel to only spent nuclear fuel (in varying amounts, depending on the reactor type alternative and the nuclear power growth scenario). The estimates of spent nuclear fuel vary widely among the alternatives.

Some of the proposed GNEP programmatic alternatives assume the recycling of commercial spent nuclear fuel. By 2010, commercial reactors will have discharged 63,000 MTHM of spent nuclear fuel, the same as the amount in the Repository SEIS Proposed Action inventory. Although many uncertainties are associated with implementation of the GNEP program, it is possible that commercial spent nuclear fuel in excess of the Proposed Action could be recycled using one of the technologies considered by GNEP. The high-level radioactive waste that would result from this recycling, rather than the spent nuclear fuel, would require geologic disposal. As a result, DOE has modified the Repository SEIS evaluation of the additional inventory modules to assess the potential environmental impacts associated with various GNEP alternatives under consideration.

In addition to the above, DOE received comments on a number of other key issues – Environmental Justice, Mitigation Measures and Compensation, No-Action Alternative, the Mina Corridor, the appropriate lead agency, and others – that apply to the Nevada Rail Corridor SEIS or the Rail Alignment EIS. The Comment-Response Documents for those EISs discuss these issues and include the DOE responses.

Organization of the Comment-Response Document

This Comment-Response Document contains the comments received on the Draft Repository SEIS and the DOE responses to them. DOE extracted the individual comments from comment documents and categorized them according to the topical outline prepared for this Comment-Response Document.

Because a number of comments were similar, the Department has combined and summarized them. The chapters of this document contain every comment DOE received on this SEIS (either in summaries or individually) and the DOE responses, as follows:

Chapter 1. Proposed Action
Chapter 2. National Environmental Policy Act Process
Chapter 3. Legal, Regulatory, and Policy Issues
Chapter 4. Alternatives
Chapter 5. Purpose and Need for Agency Action
Chapter 6. Repository Design and Performance
Chapter 7. Existing Environment and Environmental Consequences
Chapter 8. Preclosure Impacts
Chapter 9. Postclosure Impacts
Chapter 10. No-Action Alternative Impacts
Chapter 11. Cumulative Impacts
Chapter 12. Impact Mitigation and Compensation
Chapter 13. DOE Credibility
Chapter 14. SEIS Presentation
Chapter 15. General Participation
Chapter 16. Comments Submitted to the Process

Chapter 17 contains comments that DOE received that are outside the scope of this SEIS, and responses to those comments as appropriate.

The compact disks that are part of this Final Repository SEIS contain electronically scanned images of the transcripts of all the public hearings along with scanned images of all letters, e-mails, faxes, etc., for the Draft Repository SEIS.

How To Use This Comment-Response Document

Tables CR-1 and CR-2 provide alphabetical guides to the location of comments by organizations and individuals, respectively. Table CR-2 lists anonymous submittals as "Anonymous"; in addition, it lists as "Illegible" submittals for which DOE could not read the signature. To find a comment and the DOE response, locate the commenter's name (by individual or organization) in the appropriate table and turn to the index location listed. The identification number in parentheses after the index location identifies the comment-response pair.

As an actual example, Alice Bartholomew submitted a letter (comment document RRR000529) that contains 14 identified comments. To read the DOE responses to Ms. Bartholomew's comments, first find her name in Table CR-2. In addition to her name, the table includes the locations of her 14 comments and the DOE responses to those comments.

Note that Ms. Bartholomew submitted comments on (or DOE interpreted her comments to apply to) all three of the NEPA analyses. The Repository SEIS Comment-Response Document responds to comments beginning with 1; the Nevada Rail Corridor SEIS Comment-Response Document responds to comments beginning with 2; and the Rail Alignment EIS Comment-Response Document responds to comments beginning with 3.

To read the response to Ms. Bartholomew's first comment, turn to Section 1.1.3 of the Repository SEIS Comment-Response Document, response number (15); to read the response to her twelfth comment, turn

to Section 2.1.2 of the Nevada Rail Corridor SEIS Comment-Response Document, response number (1418); and to read the response to her thirteenth comment, turn to section 3.2.4.2 of the Rail Alignment EIS, response number (7).

To read Ms. Bartholomew's comments in the context of her original letter, find comment document RRR000529 on the compact disk included with this Comment-Response Document, on the Yucca Mountain Project's Internet web site (http://www.ymp.gov), or in the copy at the nearest DOE Reading Room. Comment document RRR000529 is a scanned image of Ms. Bartholomew's letter with brackets around each identified comment.

Table CR-3 is a cross-reference from the comments and responses back to the commenter(s). This table identifies who made each comment and, for summary comments, the group of commenters.

Table CR-1. Index to comments by organizations.

Commenting Organization	Comment Document Number	Location of Comments/Responses
Alliance for Nuclear Accountability		
Meyer, Alfred	RRR000330	1.6.3 (73), 1.6.3.2 (176), 1.7.8 (268), 1.4.4 (29)
	RRR000726	1.1.3 (15), 1.9 (75), 1.3.2 (4167), 3.4.4 (36), 1.3.3 (4168), 1.6.3.2 (176), 1.6.2.5 (142), 1.11 (4193)
Alliance for Nuclear Responsibility		
Becker, Rochelle	RRR000603	1.2 (9), 1.2.1 (55), 1.6.2 (62), 1.2.1 (156), 1.6.2.7 (3014), 1.6.2 (3015), 1.7.14 (4198), 1.6.2.1 (61), 1.3.3 (4168), 1.2 (13)
Weisman, David	RRR000089	1.2 (12), 1.2.1 (156), 1.6.2.7 (431), 1.6.2.5 (144)
	RRR000120	1.2.1 (156), 1.6.2.7 (3014), 1.6.2 (3015)
Alphatech, Inc.		
Curtis, Steven P.	RRR000137	1.1.4 (16)
Beyond Nuclear		
Kamps, Kevin J.	RRR000237	1.6.2.1 (61)
	RRR000325	1.2 (9), 1.11 (4191), 1.6.3.2 (1556), 1.6.3 (1557), 1.7.15 (1593), 1.13 (28), 1.3.2 (4167), 1.1.3 (15), 1.9 (1561)
	RRR000357	1.6.2.1 (61)
	RRR000241	1.2 (9), 1.11 (4191), 1.6.3.2 (2600), 1.6.3 (74), 1.3.2 (4167), 1.1.3 (15), 1.7.8 (2604), 1.2.6 (27), 1.6.2 (52)
	RRR000260	1.4.6 (31)
Big Pine Paiute Tribe of the Owens Valley		
Moose, Virgil	RRR000675	1.7.18.2 (2725), 1.2 (9), 1.2 (13), 1.3.2 (4167), 1.7.3 (2804), 1.7.4 (2846), 1.7.4 (2850), 1.7.18.2 (2854), 1.7.18.1 (2855), 1.7.6 (4086), 1.7.6 (4179), 1.6.3.2 (175), 1.7.13 (171), 1.6.5 (58), 1.2 (111), 1.4.4 (29), 2.4.1 (41), 3.7.14.1 (4036), 2.7.7 (2319), 3.7.6 (2479), 3.7.14.2 (2489), 1.6.2.7 (2490), 3.7.14.2 (2492), 3.4.7 (2565), 1.1.3 (15), 1.6.3.2 (176)
CSG Midwest		
Beetem, Jane	RRR000655	1.2.3 (25), 1.6.2.5 (155), 1.6.3.2 (176), 1.7.14.1 (3008), 1.7.14.1 (2962), 1.7.14.1 (2961), 1.3.3 (2960), 1.6.2.5 (2907), 1.6.2 (2906), 1.3.1 (2905), 1.6.2.5 (141), 1.6.2.2 (2837), 1.6.2.5 (2836), 1.6.2.5 (2835)
Caliente BLM Field Office		
Clementsen, Ron	RRR000017	3.2.4.1 (629)
California Energy Commission		
Boyd, James D.	RRR000642	1.2.1 (156), 1.2 (12), 1.4.1 (49), 1.7.14.1 (3348), 1.7.14.1 (3615), 1.7.14 (3616), 1.7.14 (3661), 1.7.14 (3662), 1.12.1 (3663), 1.6.2 (51), 1.11 (3703), 1.6.3.2 (176), 1.7.14.1 (3706), 1.7.14.1 (3744), 1.7.14.1 (3746), 1.7.14.1 (3747), 1.7.4 (3749), 1.12.1 (84), 1.6.3 (73), 1.6.3 (74), 1.3.3 (4168), 1.7.7 (4230)
California Valley Miwok Tribe		
Burley, Silvia	RRR000751	1.1.3 (15), 1.3.2 (4167)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Californians for Safe, Clean, Efficient Nuclear Power		
Walker, Daniel	RRR000176	1.1.4 (16), 2.1.4 (71), 3.4 (3589), 1.12.1 (4105), 3.4.3 (1), 1.7.7 (3590), 3.6 (120), 1.4.5 (30)
Center for Disease Control and Prevention, Dept. of Health and Human Services		
Dannenberg, Andrew L	RRR000452	3.7.8 (830)
	RRR000453	2.7.8 (936)
	RRR000454	1.7.8 (942)
Center for Safe Energy		
Macy, Francis U.	RRR000696	1.1.3 (15)
Churchill County Commissioners		
Washburn, Gwen	RRR000523	1.2.1 (72), 1.2 (60), 3.12 (139), 3.7.7 (81), 3.11 (4170), 1.7.14 (4192), 3.4.6 (99), 1.7.14.1 (2773), 1.6.2.2 (2772), 2.4.1 (1995), 2.4.2 (145), 2.6 (1946), 2.4.1 (151), 2.7.1 (1841), 2.7.1 (1839), 2.7.4 (2699), 2.7.4 (54), 2.7.4 (2697), 2.7.4 (2696), 2.7.4 (2695), 2.7.4 (2694), 2.7.6 (2693), 2.7.8 (2692), 2.7.7 (4175), 2.2.5 (2690), 2.7.7 (2689), 2.7.7 (4173), 2.7.7 (4164), 2.11 (1701), 2.7.4 (2623), 2.7.5 (2622), 3.2.1 (47), 3.3.2 (161), 3.7.1 (116), 3.7.11 (2617), 3.7.7 (63), 3.11 (2614), 3.7.7 (2613), 3.2.5 (2612), 3.11 (1528), 3.11 (1526), 3.11 (1525), 3.11 (1523), 3.11 (4171), 2.2 (1980), 2.7.1 (1724), 2.7.7 (4164), 2.11 (4182), 2.15 (147), 1.7.14 (1986), 3.15 (1985), 3.1.2 (2), 3.4.5 (1983), 3.6.4 (1982), 2.4.1 (151), 2.4.6 (1913), 3.4.3 (1912), 2.7.1 (1720), 2.7.1 (1910), 2.7.4 (1908), 2.15 (1879)
City of Caliente		
Acklin, Tom	RRR000115	3.4.1 (23), 3.4.1 (22), 3.4.1 (38), 3.12 (139), 3.4.1 (602), 1.1.4 (16)
Larson, Keith	RRR000016	3.12 (139), 3.12 (4186)
Moore, Ashley	RRR000118	1.1.4 (16), 3.4.1 (23), 3.3.1 (169), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
Phillips, Kevin	RRR000012	1.1.4 (16), 1.4.6 (31), 3.4.3 (1), 3.4.1 (23), 3.3.1 (169), 3.4.1 (3395), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
	RRR000116	1.1.4 (16), 1.4.6 (31), 3.4.3 (1), 3.4.1 (23), 3.3.1 (169), 3.4.1 (3395), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
	RRR000641	3.2.3 (890), 3.2.1 (47), 1.2.1 (55), 1.4.4 (29), 2.4.1 (41), 3.12 (139), 3.4.6 (911), 3.3.2 (161), 3.4.3 (914), 3.3.1 (826), 3.4.1 (1071), 3.7.8 (831), 3.3.1 (169), 3.15 (833), 3.7.9 (834), 3.7.9 (835), 3.7.9 (836), 3.6 (177)
City of Henderson Schroder, Gerri	RRR000269	1.1.3 (15), 1.6.3.2 (176), 1.3.1 (3828)
City of Las Vegas		
Goodman, Oscar	RRR000266	1.1.3 (15)
City of Las Vegas, Councilman		
Ross, Steve	RRR000268	1.1.3 (15), 1.3.1 (4169)

Commenting Organization	Comment Document Number	Location of Comments/Responses
City of Reno		
Cashell, Robert A.	RRR000314	1.1.3 (15), 3.4.2 (669)
	RRR000680	1.2 (9), 1.2 (4), 1.1.3 (15), 1.2 (12), 3.4.2 (2040), 3.4.2 (2067), 1.7.14.2 (4180), 1.7.14.2 (2072), 1.7.14 (2074), 1.2.6 (27)
Clark County		
Brager, Susan	RRR000270	1.1.3 (15), 1.7.15 (4056), 1.3.1 (3829)
Clark County Nuclear Waste Program		
Navis, Irene	RRR000280	1.2.1 (72), 1.2.2 (50), 1.3.1 (344), 1.7.14 (4192), 1.6.2.5 (163), 1.6.5 (58), 1.4.5 (30), 1.3.3 (4168), 1.11 (4191), 1.6.5 (56), 1.13 (28)
Clark County, Nevada, Dept. of Comprehensive Planning		
Navis, Irene	RRR000681	1.2.6 (27), 1.13 (28), 1.6.3 (70), 1.11 (3006), 1.11 (3007), 1.11 (3037), 1.7.3 (3038), 1.7.7 (3039), 1.7.15 (3040), 1.7.15 (3084), 1.7.16 (4233), 1.8.1 (33), 3.4.2 (42), 1.7.14 (4192), 1.6.3.2 (176), 1.6.2 (51), 3.12 (139), 3.11 (4177), 3.2.1 (47), 3.7.8 (2337), 1.7.16 (2367), 3.7.8 (2369), 1.7.14 (2371), 3.7.8 (2398), 3.7.8 (2399), 3.6.4 (2400), 3.4.3 (2402), 3.6 (124), 1.7.4 (2450), 1.11 (2452), 1.11 (2453), 1.6.3 (74), 1.7.2 (2456), 3.7.2 (2531), 3.7.9 (2532), 1.12 (2533), 1.2.1 (72), 1.2 (4), 1.7.8 (3041), 1.7.2 (3042), 1.7.8 (3043)
Coalition 21		
Tanner, John	RRR000138	3.1.4 (69)
Colvin & Sons, LLC		
Colvin, Tom	RRR000665	3.2 (11), 3.12 (139), 3.2.4.1 (17), 3.7.1 (4185)
Commonwealth of Virginia, Dept. of Environmental Quality		
Irons, Ellie L.	RRR000679	1.7.14.1 (2794), 1.1.4 (16)
Concern Citizens of Amargosa Valley		
Boydston, Donald	RRR000104	1.3.1 (577)
Congress of the United States	RRR000678	1.2.1 (55), 1.6.3.2 (176), 1.6.3 (70), 1.6.3 (73),
Reid, Harry		3.15 (152), 3.2.1 (47), 3.7.3 (1348), 3.7.4.1 (1349), 3.7.7 (1386), 3.7.7 (1387), 1.7.14 (4198), 1.2 (60), 1.2 (14)
	RRR000290	1.2.1 (113), 1.2 (14), 1.2.1 (55), 1.6.3.2 (176), 1.9 (426), 1.3.3 (427), 3.7.1 (428), 3.2.1 (47)
Consolidated Group of Tribes and Organizations		
Arnold, Richard W.	RRR000101	3.7.14.2 (2640), 3.7.4.1 (3664), 1.4.4 (29), 1.7.14 (4192), 3.7.6 (445), 3.7.7 (48), 3.7.6 (446), 3.7.6 (3666), 3.2.6 (94), 3.7.14.1 (2567), 3.7.14.2 (2568), 3.7.14.2 (2569), 3.7.2 (360), 3.7.14.2 (2571), 1.2 (9), 1.7.18.2 (4053)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Consolidated Group of Tribes and Organizations		
Arnold, Richard W. (continued)	RRR000671	3.7.14.2 (3957), 1.7.4 (3959), 1.6.1 (67), 1.7.14 (4192), 1.3.3 (3963), 3.7.7 (48), 2.7.6 (3966), 1.7.18 (3968), 1.7.7 (4232), 1.3.1 (3971), 1.7.6 (4179), 1.2.6 (27), 2.7.6 (3976), 2.7.6 (4022), 3.7.6 (4026), 3.7.6 (4028), 3.7.14.2 (4032), 2.15 (4034), 2.6 (4035), 3.7.14.1 (4036), 2.7.5 (4070), 2.7.8 (4071), 2.11 (4181), 2.7.6 (4076), 3.7.14.2 (4081), 3.1.2 (4083), 3.6 (129), 3.7.14.1 (4120), 3.7.14.2 (4123), 3.7.1 (4126), 3.7.13 (168), 3.12 (139), 3.7.5 (3103), 3.7.14.1 (3104), 3.7.6 (3146), 3.7.6 (3147), 3.7.14.2 (2489), 3.7.1 (3152), 3.7.13 (3154), 3.7.6 (3156), 3.7.6 (3158), 3.7.6 (3192), 3.7.1 (3193), 3.11 (4176), 3.11 (3196), 3.7.6 (3198), 3.15 (3199), 3.7.13 (3982), 3.3.3 (3984), 3.3.3 (3985), 3.8 (3986), 3.7.6 (4037), 1.7.18.2 (4038), 1.7.6 (4039), 1.7.18.2 (4040), 1.7.18 (4042), 1.7.1 (4043), 1.7.1 (4044), 1.7.18.2 (4045), 1.7.18.1 (4046), 1.7.7 (4048), 1.7.7 (4049), 1.7.13 (171), 1.7.6 (4086), 1.12.1 (4088), 1.7.6 (4090), 1.7.18.2 (4091)
Corporation of Newe Sogobia		
Wells, John	RRR000836	1.3.2 (4167), 3.4.2 (42), 1.4.6 (31), 1.11 (1684), 1.7.6 (1685), 1.7.7 (4231), 1.3.1 (4169), 3.7.1 (1688), 1.7.16 (1689), 1.7.8 (1690), 1.7.8 (2321), 3.3.2 (161), 3.6 (120), 2.7.1 (2324), 1.6.3.2 (175), 3.2.4.2 (7), 3.3.2 (2327), 1.7.13 (171)
Council for a Livable World		
Day, Alice T.	RRR000643	1.1.3 (15)
County of Inyo, Yucca Mountain Repository Assessment Office		
Gaffney, Matt	RRR000239	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 1.4.1 (49), 1.7.15 (3907), 1.6.2 (62), 1.6.3.2 (176), 1.7.7 (626)
County of Lincoln		
Rowe, Tommy	RRR000019	1.16 (170)
County of San Bernardino, Board of Supervisors		
Mitzelfelt, Brad	RRR000673	1.1.3 (15), 1.2 (4), 1.3.1 (2294), 1.7.14 (4198), 1.6.2.1 (61), 1.3.1 (4169)
D.C. Minerals, Inc.		
Fought, Dale	RRR000814	3.4 (24)
Dia Art Foundation		
Weiss, Jeffrey	RRR000652	3.4.1 (35)
Duckwater Shoshone Tribe		
Millett, Jerry	RRR000693	3.7.6 (4146), 2.7.13 (1485), 2.7.6 (1486), 2.7.6 (1488), 3.7.14.1 (1490), 3.7.14.1 (1492), 3.7.7 (48), 3.7.8 (4224), 3.7.6 (1497), 3.7.13 (168), 3.7.5 (1549), 3.7.6 (1551), 1.3.2 (4167)
Energy Communities Alliance		
Akuthota, Nithin	RRR000326	1.1.4 (16)
Environment America		
Linder, Josh	RRR000328	1.1.3 (15), 1.9 (263), 1.2.6 (27), 1.6.2 (52)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Esmeralda County		
Rannells, Ed	RRR000073	3.1.4 (69), 3.4 (24), 3.7.7 (2793)
	RRR000107	3.4 (24)
Esmeralda County, Board of County Commissioners		
Kirby, William C.	RRR000068	1.1.4 (16), 3.4.6 (98), 3.4.6 (99)
	RRR000235	1.6.3.2 (3338), 3.7.1 (4225), 3.4 (24), 3.4.6 (98), 1.6.2 (3402), 3.4.6 (99)
	RRR000666	1.6.3.2 (176), 3.4 (24), 3.4.6 (98), 1.6.2 (3743), 3.4.6 (99), 3.4.1 (3382), 3.7.6 (3640), 3.7.1 (3679), 3.7.1 (3683), 3.7.7 (3684)
Esmeralda County, Nevada, Board of County Commissioners		
Boland, Nancy	RRR000395	3.7.1 (4225), 3.4 (24)
Eureka County Assessor's Office		
Mears, Michael A.	RRR000669	2.7.1 (128)
Eureka County Board of Commissioners		
Ithurralde, James P.	RRR000664	1.2.3 (25), 2.4.2 (2765), 1.2.1 (113), 1.2 (9), 3.2 (11), 2.2.1 (43), 2.7.1 (128), 2.4.2 (3087), 3.7.1 (116), 2.7.7 (4164), 2.7.7 (4175), 3.7.7 (81), 2.7.5 (2372), 2.7.5 (2401), 3.7.5 (148), 3.15 (2451), 3.6.2 (130), 3.6.2 (87), 3.7.1 (3052), 3.7.4.2 (1125), 3.7.5 (1122), 3.7.8 (3089), 3.4.4 (36), 1.12 (4187), 3.12 (139), 1.6.2 (52), 1.7.14 (2461), 1.6.2 (164), 1.6.2.1 (61), 1.6.2 (2467), 1.3.1 (4169), 1.8.1 (33), 1.6.3 (73), 1.11 (2392), 2.4.2 (2654), 1.7.14 (2710), 1.9 (2714)
For A Better Nevada		
Phillips, Kevin J.	RRR000706	1.1.4 (16)
HOME – Healing Ourselves and Mother Earth		
Hadder, John	RRR000046	1.3.2 (4167), 1.2 (10), 3.4.2 (42), 1.3.3 (4168), 1.6.5 (56)
	RRR000737	1.2 (12), 1.2 (9), 1.3.1 (3913), 3.3.2 (1474), 2.2 (1475), 1.6.3.3 (3619), 1.6.3.2 (175), 1.6.3.3 (3620), 1.6.3 (70), 1.11 (4194), 1.2.1 (2387), 1.3.3 (3914), 1.9 (3132), 1.2.1 (113), 1.7.4 (4064), 1.2.1 (72), 1.7.8 (1482), 1.2.6 (27), 1.7.7 (3629), 1.7.7 (2709), 1.9 (4135), 1.9 (4107)
Viereck, Jennifer O.	RRR000061	1.2 (10), 1.7.4 (396), 1.1.3 (15), 1.3.2 (4167)
	RRR000092	1.1.3 (15), 1.7.4 (4050)
	RRR000712	1.7.4 (4188), 1.7.4 (4189), 1.7.7 (2735), 1.7.7 (4231), 1.3.2 (4167), 1.6.3.2 (176), 1.7.12 (134), 1.11 (4193), 1.6.3 (74), 1.7.15 (2807), 1.2.1 (72), 3.4.4 (36), 1.6.2 (44), 1.7.14 (4198), 1.6.2.1 (61), 1.3.3 (2813), 1.2 (12), 1.2 (13)
Hornbeck Law Office		
Hornbeck, David A.	RRR000192	1.4.4 (29), 1.7.16 (4233)
Humboldt River Basin Water Authority		
Hodges, Bennie	RRR000029	1.2 (60), 2.4.1 (41)
Indigenous Law Institute		
Newcomb, Steven	RRR000660	1.3.2 (4167)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Institute for Energy and Environmental Research		
Chalmers, Lois	RRR000676	1.9 (76)
Inyo County, Board of Supervisors		
Bilyeu, Jim	RRR000396	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 3.4.4 (36), 3.6.3 (467), 1.6.3.2 (176), 1.6.2 (62), 1.6.2.7 (356), 1.3.3 (4168), 1.3.1 (491), 1.7.6 (477), 1.2 (12), 1.7.3 (479), 1.7.3 (482), 1.7.3 (483), 1.7.3 (484), 1.7.4 (485), 1.7.4 (486), 1.7.4 (487), 1.7.4 (488), 1.7.4 (489), 1.7.4 (492), 1.7.4 (493), 1.7.4 (494), 1.11 (495), 1.12.1 (496)
	RRR000521 (duplicate of RRR000396)	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 3.4.4 (36), 3.6.3 (467), 1.6.3.2 (176), 1.6.2 (62), 1.6.2.7 (356), 1.3.3 (4168), 1.3.1 (491), 1.7.6 (477), 1.2 (12), 1.7.3 (479), 1.7.3 (482), 1.7.3 (483), 1.7.3 (484), 1.7.4 (485), 1.7.4 (486), 1.7.4 (487), 1.7.4 (488), 1.7.4 (489), 1.7.4 (492), 1.7.4 (493), 1.7.4 (494), 1.11 (495), 1.12.1 (496)
Inyo County, Fifth District		
Cervantes, Richard	RRR000080	1.16 (170)
Inyo County, Yucca Mountain Repository Assessment Office		
Gaffney, Matt	RRR000059	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 1.7.7 (626), 1.4.1 (49)
	RRR000082	1.7.4 (3708), 1.3.3 (4168), 1.7.7 (4230), 1.4.6 (31), 1.6.3.2 (176), 1.7.13 (171)
J&K Expo		
Fleming, Jay	RRR000130	1.1.3 (15)
JOSSCH-LLC		
Wetch, Joe	RRR000011	1.4.6 (31)
	RRR000125	1.2 (101), 1.4.6 (31)
John Uhalde and Company	RRR000618	3.7.1 (116), 3.7.1 (1427), 3.6 (129), 3.12 (139),
Uhalde, Gracian		3.6 (93), 3.6.2 (122), 3.6.3 (108), 3.4.3 (1375), 3.2.5 (167), 3.7.1 (117), 3.11 (4172), 3.7.1 (118), 3.6 (107), 3.6 (109), 3.6.3 (96), 3.6.2 (130), 3.6 (133), 3.6 (120), 3.6 (105), 3.6 (132), 3.7.4.2 (1443), 3.12 (4186)
LOC Inc. – Oak Ridge Reservation Local Oversight Committee		
Mulvenon, Norman	RRR000702	1.1.4 (16)
La Comunidad		
Nichols, Jean	RRR000685	1.1.3 (15), 1.3.2 (4167)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Lander County, Board of Commissioners		
Chapin, Chuck	RRR000646	3.12 (139), 1.7.14 (4183), 3.2.1 (47), 1.7.14.2 (4162), 1.7.14.2 (2034), 3.4.6 (99), 1.7.14 (1725), 1.11 (4191), 3.12 (139), 3.7.7 (81), 1.7.14 (4192), 1.7.14 (1997), 2.4.2 (1931), 2.4.4 (37), 2.2.1 (43), 2.4.1 (1995), 2.7.1 (1724), 2.7.7 (4164), 2.11 (4182), 2.15 (147), 1.7.14 (1986), 3.15 (1985), 3.1.2 (2), 3.4.5 (1983), 3.6.4 (1982), 2.4.2 (145), 2.2 (1980), 2.6 (1946), 2.4.1 (151), 2.4.6 (1913), 3.4.3 (1912), 2.7.7 (4175), 2.7.1 (1720), 2.7.1 (1910), 2.7.4 (1908), 2.15 (1879), 2.7.1 (1841), 2.7.1 (1839), 2.7.4 (54), 1.7.14 (4183), 2.7.7 (4175), 2.2.5 (2690), 2.7.7 (2689), 2.7.7 (4173), 2.7.7 (4173), 2.7.7 (4164), 2.11 (1701), 3.6 (132), 2.11 (1697), 3.3.2 (161), 3.7.1 (116), 3.11 (1523), 3.7.7 (63), 3.7.7 (1532), 3.11 (1531), 3.11 (4170), 3.11 (4170), 3.11 (1528), 3.11 (1526), 3.11 (1525), 3.11 (1523), 3.11 (4171)
Las Vegas Indian Center Reed, Debra	RRR000283	1.7.18 (630), 1.4.6 (31), 3.4.2 (42), 1.7.18.2 (633)
Las Vegas Paiute Tribe		
Anderson, Kenny	RRR000273	1.1.3 (15)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Lincoln County, Nevada, Board of County Commissioners		
Hornbeck, Ronda	RRR000617	1.2.2 (50), 1.3.3 (1000), 3.2 (11), 1.2.1 (55), 1.3.3 (1003), 1.9 (97), 1.12 (162), 1.12 (4187), 3.2.4 (1009), 1.2 (14), 3.6 (120), 1.1 (961), 2.4.7 (962), 1.4.1 (49), 1.1 (964), 1.7.8 (965), 2.4.7 (82), 1.6.2 (51), 1.7.14 (971), 1.12 (975), 1.12 (976), 2.1.1 (977), 2.2.4 (979), 2.1 (1033), 2.4.4 (37), 2.2.1 (43), 3.1.1 (1043), 3.2.4.1 (1047), 3.2.4.2 (1048), 3.12 (139), 3.4.7 (1051), 3.2 (1053), 3.4.6 (1058), 3.3.2 (161), 3.15 (1060), 3.4.3 (1061), 3.4.3 (1010), 3.6.2 (131), 3.6.2 (130), 3.4.5 (1014), 3.6.2 (122), 3.12 (4186), 3.4.1 (1021), 3.15 (152), 3.6.2 (102), 3.6 (92), 3.6.2 (91), 3.7.1 (1027), 3.7.1 (1028), 3.7 (1030), 3.3.2 (1031), 3.6.3 (1032), 3.6.3 (85), 3.6.3 (96), 3.6.2 (1091), 3.6 (132), 3.7.4.2 (1095), 3.6.3 (1102), 3.6.2 (106), 3.6.2 (88), 3.6.3 (110), 3.6.3 (1105), 3.6.3 (86), 3.6.4 (1063), 3.6 (133), 3.6.4 (126), 3.6.4 (83), 1.6.2.5 (1069), 3.4.1 (1071), 3.4.7 (78), 3.4.7 (1075), 3.7 (1079), 3.7.1 (118), 3.2.5 (167), 3.7.7 (79), 3.7.2 (1088), 3.7.3 (1089), 3.7.3 (1081), 3.7.3 (1082), 3.7.1 (1083), 3.7.3 (1084), 3.7.1 (116), 3.7.5 (1131), 3.7.3 (1133), 3.7.3 (1134), 3.7.1 (117), 3.7.1 (1136), 3.7.2 (114), 3.7.4.1 (174), 3.7.4.1 (1140), 3.7.4.2 (1141), 3.7.4.1 (115), 3.7.4.2 (1143), 3.7.5 (1144), 3.7.5 (1145), 3.7.5 (148), 3.7.5 (1147), 3.7.7 (1150), 3.6.3 (1155), 3.6 (112), 3.6 (93), 3.7.7 (1159), 3.7.10 (1162), 3.2.6 (94), 3.7.3 (1119), 3.7.3 (1120), 3.7.3 (1121), 3.7.1 (1123), 3.7.1 (1127), 3.7.1 (1200), 3.7.1 (1202), 3.7.10 (1204), 3.7.10 (1205), 3.7.10 (1206), 3.6.2 (87), 3.7.4.1 (1211), 3.7 (1213), 3.7.4.2 (140), 3.7.4.2 (154), 3.7.4.2 (159), 3.7.4.2 (1216), 3.7.4.2 (1217), 3.7.4.2 (1218), 3.7.4.2 (1168), 3.7.4.2 (1170), 3.7.5 (1171), 3.7.5 (1194), 3.7.5 (1197), 3.7.5 (1198), 3.6.2 (90), 3.7.7 (64), 3.7.7 (63), 3.7.7 (1191), 3.7.7 (1193), 3.6 (177), 3.3.1 (169), 3.7.8 (1301), 3.7.8 (1304), 3.11 (1307), 3.11 (4172), 3.11 (1310), 3.11 (1311), 3.11 (1312), 3.11 (1314), 3.11 (1315), 3.11 (1316), 3.11 (1318), 3.6.4 (95), 3.11 (1321), 3.11 (1323), 3.7.8 (1222), 3.8 (1356), 3.8 (1353), 3.8 (1354), 3.8 (1355), 3.8 (1357), 3.8 (1359), 3.2 (1360), 3.2 (1361), 1.6.2 (1363), 1.6.2 (1364), 1.6.2 (1365), 3.2 (1366), 3.4.4 (36), 2.2 (1368), 3.7.8 (1369), 3.7.5 (1370), 3.7.7 (48), 1.3.1 (1324), 3.7.7 (66), 3.2 (1328), 3.7.2 (1330), 3.7.8 (1331), 3.2.1 (47), 1.3.1 (4169), 3.6 (105), 3.8 (4226), 3.8 (4227)
Los Angeles County Museum of Art		
Govan, Michael	RRR000433	3.4.1 (35)
Maryland Dept. of Planning		
Janey, Linda C.	RRR000129	2.2.3 (1269), 1.2.3 (25)
	RRR000306	1.2.3 (25)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Maryland Dept. of the Environment Mueller, Joanne D.	RRR000027	1.2.3 (25)
Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk Heinonen, Valerie	RRR000933	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.3.2 (4167), 1.6.3 (74), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Metallic Goldfield, Inc. Ward, Jeffrey R.	RRR000002	3.4 (462)
Mid-Island Radiation Alert Goodman, Miriam	RRR000608	1.1.3 (15)
Midwest Coalition for Responsible Investment Jennings, Barbara	RRR000543	1.1.3 (15)
Mineral County, Board of Commissioners Fowler, Ed	RRR000682	3.2.1 (47), 1.7.14.2 (4162), 1.7.14.2 (2034), 3.4.6 (99), 1.7.14 (2032), 1.7.14 (1725), 1.11 (4191), 3.12 (139), 3.7.7 (81), 1.7.14 (4192), 1.7.14 (1997), 2.4.1 (1995), 2.7.1 (1724), 2.7.7 (4164), 2.11 (4182), 2.15 (147), 1.7.14 (1986), 3.15 (1985), 3.1.2 (2), 3.4.5 (1983), 3.6.4 (1982), 2.4.2 (145), 2.2 (1980), 2.6 (1946), 2.4.1 (151), 2.4.6 (1913), 3.4.3 (1912), 2.7.1 (1720), 2.7.1 (1910), 2.7.4 (1908), 2.15 (1879), 2.7.1 (1841), 2.7.1 (1839), 2.7.4 (54), 2.7.4 (2697), 2.7.4 (2696), 2.7.4 (2695), 2.7.4 (2694), 2.7.6 (2693), 2.2.5 (2690), 1.7.14 (4183), 2.7.7 (4175), 2.7.7 (2689), 2.7.7 (4173), 2.11 (1701), 3.6 (132), 2.11 (1697), 3.3.2 (161), 3.7.1 (116), 3.7.7 (63), 3.7.7 (1532), 3.11 (1531), 3.11 (4170), 3.11 (1528), 3.11 (1526), 3.11 (1525), 3.11 (1523), 3.11 (4171)
Moapa Band of Paiutes Daboda, Darren	RRR000272	1.1.3 (15)
Monache Alliance Bongochi, Monty	RRR000096	1.1.3 (15)
N-4 State Grazing Board Flake, Merlin R.	RRR000621	3.7.1 (116), 3.2.4 (19), 3.2.1 (47), 3.7.1 (1427), 3.6 (129), 3.12 (139), 3.6 (93), 3.6.2 (122), 3.6.3 (108), 3.4.3 (1375), 3.2.5 (167), 3.7.1 (117), 3.11 (4172), 3.7.1 (118), 3.6 (107), 3.6 (109), 3.6.3 (96), 3.6.2 (130), 3.6 (133), 3.6 (120), 3.6 (105), 3.6 (132), 3.7.4.2 (1443), 3.12 (4186)
N-6 State Grazing Board Filippini, Hank	RRR000687	3.1.3 (53), 3.2.1 (47), 3.7.1 (116), 3.7.1 (1845), 3.6 (93), 3.6 (105), 3.6.3 (96), 3.6.2 (130), 3.6 (129), 3.6 (132), 3.6 (120), 3.12 (139), 3.6 (133), 3.7.1 (1952), 3.2.5 (167), 3.7.1 (117), 3.6.3 (85), 3.7.4.2 (2114), 3.12 (4186), 3.6 (109), 3.11 (4172), 3.7.1 (118), 3.8 (1651), 3.6 (107)

Commenting Organization	Comment Document Number	Location of Comments/Responses
NARUC – National Association of Regulatory Utility Commissioners	RRR000525	1.3.1 (1857), 1.7 (1858), 1.15 (4161), 1.3.3 (1860), 1.3.1 (1861), 1.2.1 (1862), 1.6.3.2 (1865), 1.2.4 (1894), 1.11 (1895), 1.6.2 (1897), 3.4.3 (1), 1.7.8 (1899), 1.7.16 (4234), 1.3.3 (1737), 1.4.4 (29), 1.11 (1929), 1.3.1 (1932), 1.6.2 (1959), 3.1 (1962), 3.4 (1966), 1.6.3.2 (176), 1.6.2 (164), 2.4.1 (41), 3.4.6 (98), 2.4.2 (2051), 3.4.5 (2054), 3.4.5 (2055), 3.7.7 (2057), 3.4.4 (2059), 3.7.8 (1761), 3.4 (2085)
Gray, Charles D.		
O'Connell, Brian	RRR000323	1.1.4 (16)
NEI Yucca Mountain Project		
McCullum, Rod	RRR000058	1.1.4 (16)
Nevada Group Sierra Club		
Blumensaadt, Eric C.	RRR000144	1.1.3 (15)
Native American Heritage Commission		
Singleton, Dave	RRR000032	1.7.6 (590)
Nevada Agency for Nuclear Projects		
Frishman, Steve	RRR000275	1.4.4 (29), 1.2 (111), 1.2 (9)
Nevada Nuclear Waste Task Force, Inc.		
Treichel, Judy	RRR000622	1.2.1 (55), 1.6.5 (58), 1.9 (1824), 1.6.3.2 (1823), 1.6.2 (1822), 1.6.3 (73), 3.4.2 (42), 1.7.7 (1798), 1.2.6 (27), 1.7.8 (1796), 1.2 (9)
Nevada Pharmacist Association		
Pham, Khanh	RRR000134	1.1.3 (15)
New Energy Corporation		
Vesperman, Gary	RRR000293	1.4.6 (31)
Nine Group		
Morton, Jenna	RRR000259	1.2.6 (27), 1.2 (12), 1.1.3 (15)
North Carolina, Dept. of Administration		
Baggett, Chrys	RRR000670	1.16 (170)
Northeast Pa. Audubon Society		
Dodge, Katharine	RRR000876	1.1.3 (15), 1.3.2 (4167)
Nuclear Age Peace Foundation	RRR000331	1.1.3 (15), 1.4.4 (29)
Roth, Nick		
Nuclear Energy Institute		
Binzer, Chris	RRR000039	1.1.4 (16), 3.1.4 (69)
	RRR000070	1.1.4 (16), 3.1.4 (69)
	RRR000122	1.1.4 (16), 3.1.4 (69)
Kraft, Steven P.	RRR000318	1.1.4 (16), 3.1.4 (69)
	RRR000619	3.1.4 (69), 3.4.3 (1), 3.7.8 (2313), 3.7.8 (2314), 3.15 (2315), 3.4.6 (98), 3.1.2 (2)
McCullum, Rodney	RRR000279	1.1.4 (16)
	RRR000620	1.1.4 (16), 1.7.8 (1810), 1.8.1 (33), 1.6.1 (67), 1.2.1 (46), 1.7.16 (4234), 1.6.3.2 (1744), 1.2 (111), 1.6.2.2 (1714), 1.1 (1713), 1.15 (4161), 1.7.1 (1683), 1.7.15 (1682), 1.7.15 (1681)
Seidler, Paul	RRR000007	1.1.4 (16), 3.1.4 (69)
	RRR000057	1.1.4 (16)
	RRR000278	1.1.4 (16), 3.4.1 (23)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Nuclear Information and Resource Services		
Binette, Aja	RRR000324	1.1.3 (15), 1.6.3.2 (176)
Nuclear Waste Strategy Coalition – NWSC		
Wright, David	RRR000117	1.1.3 (15), 1.6.2.5 (163), 1.7.14 (4198), 2.1.4 (71), 2.4.1 (1708), 2.4.7 (1709), 3.4.1 (23), 3.4.3 (1), 1.4.4 (29), 3.1.4 (69), 1.1.4 (16)
Nuremberg Actions		
Getty, G.	RRR000022	1.1.3 (15)
Nye County Nuclear Waste Repository Project Office		
Jaszczak, Cash	RRR000044	1.2.4 (26)
Nye County, Board of Commissioners		
Borasky, Butch	RRR000055	1.2.4 (26)
Eastley, Joni	RRR000054	1.2.4 (26)
	RRR000240	1.2.4 (26)
	RRR000656	3.4.3 (1), 3.2 (1239), 3.4.6 (98), 3.4.6 (1241), 3.1.2 (2), 3.4.6 (1362), 3.7.8 (1327), 3.4.4 (36), 3.12 (139), 3.2.3 (59), 3.11 (1334), 2.7.8 (1335), 2.7.8 (1336), 2.7.8 (1337), 2.7.8 (1338), 2.7.8 (1345), 2.7.8 (1347), 2.2 (1350), 2.1.2 (1405), 2.1.1 (1406), 1.6.2 (1395), 3.4.6 (99), 2.7.7 (1397), 2.4.7 (1398), 2.7.7 (1399), 2.7.7 (1400), 1.7.1 (1404), 1.7.1 (1416), 2.11 (1419), 2.11 (1422), 2.11 (1428), 1.7.14.2 (1432), 2.11 (1434), 2.11 (1436), 2.11 (1437), 3.6.2 (131), 3.6 (92), 3.6 (120), 3.7.12 (1499), 3.6.2 (127), 3.4.3 (1502), 3.4.1 (1504), 3.7.7 (80), 3.7.7 (1506), 3.7.8 (1507), 3.7.12 (1508), 3.1.2 (3), 3.4.6 (1511), 3.7.3 (1470), 3.7.1 (1487), 3.7.4.1 (1491), 3.12 (4186), 3.7.4.2 (1496), 3.7.5 (1498), 3.6.2 (88), 3.7.8 (1620), 3.7.8 (1537), 3.15 (1541), 3.7.8 (1698), 3.7.8 (1702), 3.7.8 (1775), 3.7.8 (1803), 3.7.3 (1717), 3.11 (1837), 3.11 (4174), 3.4.3 (1876), 1.6.2.5 (1941), 3.11 (1942), 3.11 (1979), 2.7.7 (4175), 3.15 (1994), 3.7.8 (1996)
	RRR000657	1.7.7 (1793), 1.12.1 (1696), 1.2.1 (46), 1.7.7 (1694), 1.2 (111), 1.6.3.2 (1792), 1.2.4 (26), 1.7.7 (1691), 1.9 (77), 1.7.16 (4234), 1.7.7 (1660), 1.7.7 (1659), 1.7.1 (1767), 1.7.7 (1633), 1.7.7 (2152), 1.7.7 (2151), 1.7.7 (2149), 1.7.8 (2146), 1.7.8 (2131), 1.7.15 (2129), 1.7.15 (1766), 1.11 (1764), 1.6.5 (58), 1.9 (1763), 1.7.8 (1816), 1.7.8 (1814), 1.11 (1790), 1.2.3 (25), 1.12.1 (1789), 1.3.1 (1732), 1.15 (4161), 1.12.1 (1780), 1.7.8 (1757)
Hollis, Gary	RRR000081	1.2.4 (26)
	RRR000271	1.2.4 (26)
	RRR000320	1.2.4 (26)
Nye County, Nuclear Waste Repository Project Office		
Lacy, Darrell	RRR000658	3.12 (139), 3.4.1 (34), 3.12 (4186)
Owens Valley Indian Commission Heil, Darla	RRR000100	1.2 (9), 1.7.7 (4230), 1.7.4 (4195), 1.6.2.1 (61), 1.7.18.2 (332)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Pan-Am Legal Services		
Song, Robert	RRR000248	1.1.3 (15)
	RRR000302	1.1.3 (15)
Physicians for Social Responsibility		
McCally, Michael	RRR000861	1.1.3 (15), 1.3.3 (4168), 1.7.8 (1948), 1.7.15 (1924), 1.7.8 (1923)
Parillo, Jill	RRR000329	1.6.1 (67), 1.9 (409), 1.7.8 (410), 1.7.15 (411), 1.7.8 (412)
Progressive Leadership Alliance of Nevada		
Rake, Launce	RRR000262	1.4.4 (29)
	RRR000263	1.1.3 (15)
Public Service Commission of Wisconsin		
Ebert, Daniel R.	RRR000757	1.1.4 (16), 1.2.1 (72)
Rainforest Action Network		
Brune, Mike	RRR000705	1.1.3 (15), 1.3.2 (4167)
Regional Association of Concerned Environmentalists (RACE)		
Donham, Mark	RRR000935	1.2 (9), 1.2 (9), 1.3.2 (4167), 1.7.4 (150), 1.7.8 (3793), 1.2.6 (27), 1.1.3 (15)
Remnant Yuchi Nation		
Vest, Lee	RRR000383	1.1.3 (15), 1.7.6 (4178)
SENAA West		
Hayes, Sara	RRR000746	1.1.3 (15), 1.3.2 (4167)
Sierra Club, Mendocino Group		
Wehren, Rixanne	RRR000816	1.1.3 (15)
Sierra Safe Energy		
Schieffer, Richard	RRR000394	1.1.3 (15)
Sinai, Schroeder, Mooney, Boetsch, Bradley & Pace		
Schroeder, Theodore J.	RRR000352	1.1.3 (15)
Sisters of St. Joseph of Carondelet		
Oleskevich, Diana	RRR000938	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.3.2 (4167), 1.6.3 (74), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Southern California Ecumenical Council		
Cohen, Albert G.	RRR000483	1.1.3 (15)
Southern Ohio Neighbors Group		
Sea, Geoffrey	RRR000887	1.7.6 (4178), 1.1.3 (15)
Southwest Worker's Union		
Rendon, Genaro L.	RRR000749	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167)
State of California, Dept. of Fish and Game		
Racime, Denyse	RRR001078	1.7.5 (2331), 1.7.4 (2360)
State of California, California Energy Commission		
Byron, Barbara	RRR000043	1.2.1 (156)
	RRR000108	1.2.1 (156), 1.6.2 (52), 1.6.3.2 (176), 1.6.2 (62), 1.7.4 (532), 1.7.7 (4230), 1.6.5 (56), 1.6.2.7 (3987)

Commenting Organization	Comment Document Number	Location of Comments/Responses
State of California, Dept. of Justice		
Sullivan, Timothy	RRR000659	1.1.3 (15), 1.2.1 (156), 1.7.14 (4198), 1.7.14 (3056), 1.7.16 (2163), 1.7.14 (2164), 1.6.2 (44), 1.6.2 (62), 1.6.3.2 (176), 1.2 (12)
State of Nevada, Agency for Nuclear Projects		
Hall, Jim	RRR000321	1.6.2 (253), 1.6.1 (67), 1.6.3.2 (176), 1.7.14 (4198)
Halstead, Robert	RRR000006	1.2 (10), 1.2.1 (55), 1.6.2.7 (637), 1.7.14 (4198), 3.2.1 (47), 3.4.2 (42), 3.2.4.2 (7), 3.4.4 (36), 3.4.2 (643)
	RRR000013	1.2 (10), 1.2 (12), 1.2.2 (50), 1.2.1 (55), 1.6.2.7 (565), 3.7.1 (566), 3.4.1 (18), 3.12 (139), 1.7.14 (4198), 3.7.1 (117), 3.7.4.2 (140), 3.6.2 (106)
	RRR000038	1.2.1 (55), 3.1.3 (53), 3.4.2 (42), 3.2.4.2 (7), 1.6.2 (51), 1.6.2.5 (163), 1.7.14 (4198)
	RRR000056	1.2 (10), 1.1.3 (15), 1.6.3.2 (175), 3.2.1 (47), 2.4.1 (41), 3.2.4.2 (7), 1.6.2 (51), 3.4.4 (36), 1.6.2.5 (163), 3.7.1 (801), 3.4.1 (18), 3.7.1 (116), 3.7.4.2 (140), 3.6.2 (106), 3.2.4.2 (8)
	RRR000069	1.6.2.7 (815), 3.2.1 (47), 3.4.2 (42), 3.4.1 (18), 3.2.4.2 (8)
	RRR000274	1.1.3 (15), 1.2 (9), 1.6.2.5 (163)
	RRR000322	1.6.2.7 (726)
Loux, Robert R.	RRR000662	1.3.1 (944), 1.2.2 (50), 1.2 (4), 1.2 (111), 1.4.4 (29), 1.2.1 (55), 1.3.1 (956), 1.6.3 (73), 1.7.15 (917), 1.7.8 (918), 1.6.5 (58), 1.6.5 (57), 1.7.12 (922), 1.6.1 (67), 1.7.16 (4233), 1.2 (12), 1.6.2.5 (163), 1.6.2.5 (980), 1.7.14 (981), 1.6.2 (51), 1.6.2.7 (986), 1.6.2.5 (141), 1.6.2.5 (984), 1.6.2.7 (985), 1.6.2.7 (989), 1.6.2.7 (3181), 1.6.2.7 (990), 1.6.2.7 (991), 1.7.14.1 (992), 1.6.2.7 (993), 1.6.2.7 (994), 1.7.14 (4198), 1.6.2.5 (997), 1.2.6 (27)
	RRR000663	1.2.2 (50), 1.1 (841), 1.2 (4), 2.2 (32), 3.2.4.2 (7), 1.2 (60), 1.2 (9), 1.11 (930), 2.2.1 (43), 2.4.1 (41), 3.1 (933), 3.4.5 (937), 3.4.1 (18), 3.4.5 (939), 3.7.1 (940), 3.2.5 (941), 1.7.14 (949), 1.7.14 (4198), 3.7.14.1 (951), 1.7.16 (4233), 2.7.8 (953), 1.6.2 (164), 3.4.3 (919), 3.11 (1042), 3.4.4 (36), 1.6.2 (51), 1.7.14.2 (1046), 3.2.3 (1050), 3.2.4.1 (1052), 3.2.6 (94), 3.3.2 (1018), 3.7.10 (1093), 3.7.8 (1110), 3.7.4.2 (154), 2.1 (1132), 2.6 (1135), 2.7.1 (1148), 2.7.7 (4175), 3.6.2 (90), 3.7.1 (1153), 3.6 (93), 3.7.1 (116), 3.7.7 (66), 3.7.5 (1122), 3.7.4.2 (1125), 1.12 (4187), 3.7.1 (117), 3.6 (92), 3.7.10 (1176), 1.6.2 (1177), 3.2.3 (1178), 3.7.1 (1179), 3.7.4.2 (1181), 3.7.6 (1182), 3.7.6 (1183), 1.12.1 (4217)
State of Nevada, Dept. of Administration		
Coulter, Krista	RRR000450	1.16 (170)
	RRR000451	2.16 (755)
State of New Jersey, Dept. of Environmental Protection	RRR000567	1.6.3.2 (1457)
Koschek, Kenneth		

Commenting Organization	Comment Document Number	Location of Comments/Responses
State of Utah		
Chancellor, Denise	RRR000677	1.2.1 (55), 1.6.1 (67), 1.6.3.2 (176), 1.6.2.5 (163), 1.6.3 (70), 1.6.3.2 (175), 1.7.15 (1937), 1.7.15 (1936), 1.6.2 (52), 1.6.2 (1934), 1.7.12 (1933), 1.3.1 (4169), 1.3.1 (1906), 1.7.8 (1905), 1.7.7 (1904), 1.7.11 (1903), 1.7.4 (1874), 1.7.11 (1873), 3.7.2 (1872), 2.7.7 (1871), 1.7.14 (1870), 3.7.4.2 (1869), 1.7.17 (4145)
The City of Sparks		
Martini, Geno R.	RRR000351	1.1.3 (15)
The Menil Collection		
Helfenstein, Josef	RRR000683	3.4.1 (35)
The Stella Group, Ltd.		
Sklar, Scott	RRR000848	1.1.3 (15)
The Toiyabe Chapter of the Sierra Club		
Strickland, Rose	RRR000745	1.2.2 (50), 1.2.1 (55), 1.4.4 (29), 1.7.14 (1250), 2.4.1 (41), 3.4.3 (20), 1.7.14 (1253), 1.2.1 (113), 1.1.3 (15)
Timbisha Shoshone Tribe		
Beaman, Ed	RRR000692	1.3.1 (4165), 1.2 (9), 1.7.4 (4188), 1.7.4 (4189), 1.7.4 (2365), 1.7.7 (4231), 3.4.4 (36), 1.6.3.2 (176), 1.6.2 (62), 1.6.2.7 (2672), 1.3.3 (4168), 1.7.18.1 (2674), 1.2 (12)
Kennedy, Joe	RRR000690	1.7.18.2 (1520), 1.2 (12), 1.6.2 (1627), 1.1.3 (15), 1.7.18.2 (1625), 1.7.18.1 (1624), 1.2.6 (27), 1.3.2 (4167), 1.7.18.1 (1621), 1.6.3.2 (176), 1.7.10 (1618), 1.7.2 (1616), 1.7.4 (1614), 1.7.5 (157), 1.7.7 (1612), 1.7.8 (1610), 1.7.11 (1609), 1.7.12 (1608), 1.7.6 (1606), 1.7.6 (1605), 1.7.13 (171), 1.3.1 (4169), 1.12.1 (1601), 1.7.18 (1599), 1.7.18.2 (1591), 1.7.18 (1590), 1.7.18.2 (1589), 1.7.18 (1588), 1.7.6 (1587), 1.7.7 (1586), 1.7.18 (1585), 1.7.18.2 (1584), 3.7.14.2 (1583), 1.7.4 (4197), 1.7.15 (1581), 1.7.18.2 (1580), 1.12.2 (1578), 1.7.1 (1577), 1.7.5 (1576), 1.7.15 (1575), 1.7.8 (1574)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Timbisha Shoshone Tribe		
Kennedy, Joe (continued)	RRR000691	1.7.18.2 (1520), 1.2 (12), 1.6.2 (1627), 1.1.3 (15), 1.7.18.2 (1625), 1.7.18.1 (1624), 3.2.6 (94), 3.3.2 (4133), 3.12 (139), 3.7.1 (3106), 3.6.2 (106), 3.7.8 (3108), 3.6 (120), 3.6 (93), 3.7.1 (3113), 3.6.2 (3114), 3.7.14.2 (1583), 3.7.10 (3116), 2.7.2 (3117), 3.7.2 (3120), 3.7.2 (3121), 3.7.2 (3122), 3.7.2 (3123), 3.7.2 (3159), 2.7.4 (3160), 2.7.4 (3161), 3.7.4.1 (3162), 3.6.2 (88), 3.7.4.1 (3164), 1.7.5 (157), 2.7.5 (3166), 3.7.5 (3167), 3.7.5 (3168), 3.7.5 (3169), 2.7.7 (3349), 2.7.7 (3425), 2.7.8 (3426), 2.7.11 (3427), 2.7.11 (3428), 2.7.11 (3429), 2.7.12 (3430), 2.7.12 (3431), 2.7.12 (3432), 2.7.12 (3433), 2.7.6 (3434), 2.7.6 (3435), 2.7.13 (3436), 1.3.1 (4169), 3.7.6 (4146), 1.6.2.7 (3170), 3.4.3 (3171), 3.7.14.2 (3520), 3.7.3 (3521), 1.7.18.2 (1591), 1.7.18 (1590), 1.7.18.2 (1589), 1.7.18 (1588), 1.7.6 (1587), 1.7.7 (1586), 1.7.18 (1585), 1.7.18.2 (1584), 3.7.14.2 (1583), 1.7.4 (4197), 1.7.15 (1581), 1.7.18.2 (1580), 1.12.2 (1578), 1.7.1 (1577), 1.7.5 (1576), 1.7.15 (1575), 1.7.8 (1574)
Triple Aught Foundation		
Heizer, Michael	RRR000674	3.4.1 (35), 3.2 (1830)
Twin Springs Ranch		
Fallini, Anna	RRR000072	3.2 (4144), 3.7.1 (116), 3.14 (2454), 3.2 (11), 3.4.1 (34)
Fallini, Joe	RRR000075	1.1.3 (15), 1.6.2 (52), 3.2 (237), 1.4.6 (31), 3.7.8 (2415)
Fallini, Joe B.	RRR000710	3.3.2 (161), 3.2.1 (47), 3.7.4.2 (154), 3.7.4.1 (1671), 3.2.5 (167), 3.6.4 (95), 3.7.1 (116), 3.7.1 (117), 3.7.1 (1664), 3.7.10 (1663), 3.7.5 (1645), 3.7.5 (1644), 3.7.5 (1643), 3.7.5 (2158), 3.7.5 (2157), 3.7.5 (2156), 3.7.5 (2137), 3.7.5 (2136), 3.7.9 (2135), 3.6 (112), 3.7.5 (148), 3.2.6 (94), 3.7.1 (2103), 3.7.1 (2101), 3.7.5 (2100), 3.7.4.2 (2098), 3.7.4.2 (140), 3.7.4.2 (2077), 3.7.4.2 (2076), 3.6.3 (85), 3.7.5 (158), 3.7.5 (2000), 3.7.5 (2066), 3.7.5 (1999), 3.7.9 (3045), 3.7.7 (4138), 3.7.7 (79), 3.7.11 (1998), 3.11 (1956), 3.11 (1955), 3.3.3 (2063), 3.3.3 (1954), 3.12 (139), 3.12 (4186)
U.S. Transport Council		
Blee, David	RRR000008	1.1.4 (16)
	RRR000319	1.1.4 (16)
U.S. Department of the Interior, Bureau of Land Management	RRR001081	1.9 (77), 1.7.5 (3414)
Palma, Juan		
	RRR001082	3.7.5 (3415), 3.7.7 (80), 3.7.4.1 (3419), 3.7.5 (148), 3.2.3 (3417), 3.12 (139)
US Nuclear Energy		
Duarte, Gary	RRR000037	1.1.4 (16)
	RRR000281	1.1.4 (16)

Commenting Organization	Comment Document Number	Location of Comments/Responses
U.S. Transport Council		
Quinn, Bob	RRR000040	1.1.4 (16), 2.1.4 (71)
United States Department of the Interior		
Anspach, Allen	RRR000672	3.7.14.1 (1892)
United States Department of Commerce		
Harm, Christopher W.	RRR000568	3.16 (2653)
	RRR000569	1.12 (2656)
United States Environmental Protection Agency		
Miller, Anne Norton	RRR000667	1.3.3 (908), 1.9 (909), 1.2 (912)
	RRR000668	2.4.1 (915), 3.7.4.1 (824), 2.2 (825), 3.2 (4215)
United States Nuclear Regulatory Commission		
Weber, Michael F.	RRR000524	1.2 (3718), 1.2.1 (3719), 1.15 (4161), 1.2.1 (3721), 1.11 (3694), 1.7.12 (4010), 1.7.13 (4012), 1.2.3 (4013), 3.11 (4177), 3.6 (124), 3.7 (4109), 3.7.1 (4111), 3.2.1 (3141), 3.2.1 (3142), 3.7.13 (3143), 3.7.6 (3186), 3.7.6 (3187), 3.7.6 (3188), 3.3.3 (3189), 1.7.7 (4140), 1.7.2 (4141), 1.7.6 (4142), 1.7.15 (4143), 1.9 (3125), 1.7.8 (3126), 1.9 (3127), 1.12.1 (3128), 1.7.7 (3129), 1.7.13 (171), 3.7.3 (4150), 3.7.14.1 (4151), 3.7.4.1 (4152), 3.7.4.2 (4153), 3.7.4.2 (4154), 3.7.3 (4160), 3.11 (4155), 3.7.3 (4156), 3.7.3 (4166), 3.7.4.1 (4159), 3.7.4.2 (4147), 3.7.4.1 (4148), 3.7.4.1 (4149)
Veterans in Politics		
Sanson, Steve	RRR000295	1.1.3 (15)
	RRR000356	1.1.3 (15)
Walker Lake Working Group		
Treharne, Rolanda	RRR000392	1.16 (170)
Western Interstate Energy Board - WIEB		
Williams, Jim	RRR000661	1.6.2.5 (165), 1.6.2.5 (2573), 1.6.2.5 (155), 1.3.1 (4169), 1.6.2 (2657), 1.6.3.2 (2658), 1.6.2 (2664), 1.1 (2665), 1.7.14.1 (2742), 1.4.1 (49), 1.7.14 (4192), 1.6.2 (2806), 1.7.14 (2859), 1.7.14 (2939), 1.6.2.2 (2985), 1.6.2 (164), 1.11 (3030), 1.6.2.5 (141), 1.7.14 (3032)
Western Range Service		
Steninger, Al	RRR000020	3.12 (139)
Western Shoshone		
Gardipe, Janice	RRR000052	1.1.3 (15)
Western Shoshone Defense Project		
Bill, Larson R.	RRR000686	1.1.3 (15), 1.3.2 (4167), 3.2.4.1 (1750), 1.7.6 (2491), 1.11 (2421), 1.13 (28)

Commenting Organization	Comment Document Number	Location of Comments/Responses
Western Shoshone National Council		
Moss, Allen	RRR000865	1.3.2 (4167)
Zabarte, Ian	RRR000121	1.7.18.2 (4078), 1.7.6 (4122), 1.7.18 (4125), 1.7.18.1 (4127), 1.3.2 (4167), 1.7.18.2 (3096), 1.7.13 (171), 1.7.18.1 (3101), 1.7.18.1 (3102), 1.3.1 (3145), 1.11 (3148), 1.7.6 (3149), 1.12 (3151), 1.2.6 (27), 1.7.5 (3191), 1.7.15 (3195), 1.6.2.7 (3979), 1.7.18.2 (3197), 1.7.8 (3200), 2.7.6 (3201), 1.7.4 (4197), 1.7.7 (4231), 1.7.1 (3981), 1.7.5 (157)
	RRR000276	1.7.18 (456), 1.3.1 (4165), 1.2.6 (27)
	RRR000327	1.7.18 (450), 1.3.1 (4165), 1.2.6 (27), 1.2 (9)
	RRR000347	1.7.18 (450), 1.3.1 (4165), 1.2.6 (27)
Westinghouse		
Liparulo, Nick	RRR000727	1.1.4 (16)
Westinghouse Electric Company	RRR000221	1.1.4 (16)
Rickman, Robin		
White Pine Nuclear Waste Project Office		
Simon, Mike	RRR000522	1.2.2 (50), 1.7.14.1 (3048), 1.2.6 (27), 1.2.3 (25), 1.4.1 (49), 1.2.5 (2159), 1.9 (97), 1.6.2 (51), 1.6.2 (2162), 1.7.7 (2341), 1.3.1 (4169), 1.11 (2374), 1.15 (4161), 1.12 (4187), 2.4.1 (41), 2.4.4 (37), 1.2.1 (72), 1.12.1 (4210)
Women's International League for Peace and Freedom		
Birnie, Patricia T.	RRR000862	1.1.3 (15), 1.3.2 (4167)

Table CR-2. Index to comments by commenter name.

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Aaron, Grace		RRR000973	1.1.3 (15)
Abbott, Leal		RRR000636	1.7.6 (4178)
Abeldt, Vern		RRR000344	1.1.3 (15)
Abraham, Natalie		RRR000790	1.1.3 (15), 1.3.2 (4167)
Ace, Tom		RRR000094	1.1.4 (16)
Acklin, Tom	City of Caliente	RRR000115	3.4.1 (23), 3.4.1 (22), 3.4.1 (38), 3.12 (139), 3.4.1 (602), 1.1.4 (16)
Adair, Margo		RRR000945	1.1.3 (15)
Adams, Steven		RRR000905	1.1.3 (15)
Agan, Steven D.		RRR000950	1.1.3 (15)
Akuthota, Nithin	Energy Communities Alliance	RRR000326	1.1.4 (16)
Albert, Georgia New		RRR000438	1.7.18 (676)
Allen, Danielle		RRR000220	1.1.4 (16)
Allen, John		RRR000034	3.7.1 (888)
Alley, Charles		RRR000995	1.2 (13), 1.2.1 (55), 3.4.2 (42), 3.6.2 (90), 1.11 (3973), 1.6.1 (67), 1.6.2.5 (143), 1.6.2.5 (4021), 1.3.3 (4025), 1.6.2 (52), 1.6.3.3 (4033), 3.4.7 (4074), 1.1 (4075), 1.6.2 (4077), 1.7.5 (4079), 1.2 (9), 1.3.3 (4082), 1.6.3.2 (176), 1.3.1 (4121), 1.15 (4161), 1.6.2 (3095), 1.6.2 (3100), 1.1 (3105)
Amonette, Amber		RRR000813	1.1.3 (15)
Anderson, Andrew		RRR000256	1.1.3 (15)
Anderson, Jezreela		RRR000835	1.1.3 (15)
Anderson, Kenny	Las Vegas Paiute Tribe	RRR000273	1.1.3 (15)
Andrews, Gerald E.		RRR001019	1.1.4 (16)
Anonymous		RRR000131	1.1.3 (15)
		RRR000160	1.1.3 (15)
		RRR000207	1.1.3 (15)
		RRR000236	1.1.4 (16), 3.1.4 (69)
		RRR000377	1.1.3 (15)
		RRR000418	1.1.3 (15)
		RRR000425	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89)
		RRR000586	1.1.3 (15), 3.2.1 (47), 3.4.2 (42), 3.2.4.2 (7), 1.6.2 (51)
		RRR000602	1.1.3 (15), 1.3.2 (4167), 1.2.1 (72)
		RRR000629	1.1.3 (15)
		RRR000798	1.1.3 (15)
		RRR000841	1.6.5 (58), 1.9 (3826), 1.9 (3214)
		RRR000856	1.1.3 (15)
		RRR000895	1.1.3 (15)
		RRR000959	1.1.3 (15)
		RRR000979	1.1.3 (15)
		RRR000980	1.1.3 (15)
		RRR000997	1.1.4 (16)
		RRR000998	1.1.4 (16)
		RRR001005	1.1.3 (15)
		RRR001016	1.1.3 (15)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Anonymous (continued)		RRR001017	1.1.3 (15)
		RRR001031	1.12.2 (160)
		RRR001041	1.1.3 (15)
		RRR001044	1.1.3 (15)
		RRR001045	1.1.3 (15)
		RRR001046	1.1.3 (15)
		RRR001051	1.1.3 (15)
		RRR001057	1.1.3 (15), 1.3.2 (4167)
		RRR001059	1.1.3 (15)
		RRR001060	1.1.3 (15)
		RRR001063	1.1.4 (16)
		RRR001064	1.1.3 (15)
		RRR001067	1.1.3 (15)
		RRR001069	1.1.3 (15)
		RRR001070	1.13 (28)
		RRR001072	1.1.3 (15)
		RRR001080	1.1.3 (15)
Anspach, Allen	United States Department of the Interior	RRR000672	3.7.14.1 (1892)
Arnason, Deb		RRR000376	1.1.3 (15)
Arnason, Deb/Arne		RRR000826	1.1.3 (15)
Arnold, Davide		RRR000460	1.1.3 (15)
Arnold, Richard W.	Consolidated Group of Tribes and Organizations	RRR000671	3.7.14.2 (3957), 1.7.4 (3959), 1.6.1 (67), 1.7.14 (4192), 1.3.3 (3963), 3.7.7 (48), 2.7.6 (3966), 1.7.18 (3968), 1.7.7 (4232), 1.3.1 (3971), 1.7.6 (4179), 1.2.6 (27), 2.7.6 (3976), 2.7.6 (4022), 3.7.6 (4026), 3.7.6 (4028), 3.7.14.2 (4032), 2.15 (4034), 2.6 (4035), 3.7.14.1 (4036), 2.7.5 (4070), 2.7.8 (4071), 2.11 (4181), 2.7.6 (4076), 3.7.14.2 (4081), 3.1.2 (4083), 3.6 (129), 3.7.14.1 (4120), 3.7.14.2 (4123), 3.7.1 (4126), 3.7.13 (168), 3.12 (139), 3.7.5 (3103), 3.7.14.1 (3104), 3.7.6 (3146), 3.7.6 (3147), 3.7.14.2 (2489), 3.7.1 (3152), 3.7.13 (3154), 3.7.6 (3156), 3.7.6 (3158), 3.7.6 (3192), 3.7.1 (3193), 3.11 (4176), 3.11 (3196), 3.7.6 (3198), 3.15 (3199), 3.7.13 (3982), 3.3.3 (3984), 3.3.3 (3985), 3.8 (3986), 3.7.6 (4037), 1.7.18.2 (4038), 1.7.6 (4039), 1.7.18.2 (4040), 1.7.18 (4042), 1.7.1 (4043), 1.7.1 (4044), 1.7.18.2 (4045), 1.7.18.1 (4046), 1.7.7 (4048), 1.7.7 (4049), 1.7.13 (171), 1.7.6 (4086), 1.12.1 (4088), 1.7.6 (4090), 1.7.18.2 (4091)
Arnold, Richard W. (continued)	Consolidated Group of Tribes and Organizations	RRR000101	3.7.14.2 (2640), 3.7.4.1 (3664), 1.4.4 (29), 1.7.14 (4192), 3.7.6 (445), 3.7.7 (48), 3.7.6 (446), 3.7.6 (3666), 3.2.6 (94), 3.7.14.1 (2567), 3.7.14.2 (2568), 3.7.14.2 (2569), 3.7.2 (360), 3.7.14.2 (2571), 1.2 (9), 1.7.18.2 (4053)
Askren, Anne C.		RRR000615	1.1.3 (15)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Atencio, Sandra J.		RRR000187	1.1.3 (15)
Baggett, Chrys	North Carolina, Dept. of Administration	RRR000670	1.16 (170)
Bailey, John		RRR000553	1.1.3 (15)
Bailey, John		RRR000638	1.1.3 (15)
Bailey, W.R. (Bill)		RRR001013	1.12.2 (160)
Baker, Alan		RRR000533	1.2.1 (55)
Bakula, Marcelle		RRR000499	1.1.3 (15)
Baleria, David		RRR000009	1.1.3 (15)
Ballerano, Chrys		RRR000389	1.1.3 (15)
Ballou, Debi		RRR001071	1.1.3 (15)
Balogh, Karen		RRR000375	1.16 (170)
Balum, Anne F.		RRR000989	1.1.3 (15)
Bancroft, Kathy		RRR000098	1.1.3 (15)
Banks, Elizabeth		RRR000765	1.1.3 (15), 1.7.16 (4233)
Barber, Frank R.		RRR000873	1.1.3 (15)
Barnell, Todd		RRR000730	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Barnes, Kathryn		RRR000562	1.1.3 (15), 3.1.3 (53), 1.3.2 (4167), 3.4.3 (20), 1.7.16 (4233), 1.8.1 (33)
		RRR000580	1.1.3 (15), 3.1.3 (53), 1.3.2 (4167), 3.4.3 (20), 1.7.16 (4233), 1.8.1 (33)
Barnes, Sophie		RRR000472	1.16 (170)
Baronvine, Sonia		RRR000509	1.1.3 (15)
Baroudi, Mat		RRR001039	1.1.3 (15)
Bartholomew, Alice		RRR000529	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Barton-Russell, Rachel		RRR000846	1.1.3 (15)
Baseler, Rhonda		RRR000639	1.1.3 (15)
Bashiti, Amy B.		RRR000647	1.1.3 (15)
Bass, Patrice A.		RRR000206	1.1.3 (15)
Bassik, Renee		RRR001035	1.1.3 (15)
Batterden, James		RRR000804	1.1.3 (15), 1.7.6 (4178)
Bauer, Benjamin D.		RRR000782	1.1.3 (15), 1.3.2 (4167)
Baydoun, Gibran		RRR000210	1.1.3 (15)
Beaman, Ed	Timbisha Shoshone	RRR000692	1.3.1 (4165), 1.2 (9), 1.7.4 (4188), 1.7.4 (4189), 1.7.4 (2365), 1.7.7 (4231), 3.4.4 (36), 1.6.3.2 (176), 1.6.2 (62), 1.6.2.7 (2672), 1.3.3 (4168), 1.7.18.1 (2674), 1.2 (12)
Beazlie, Janet L.		RRR000610	1.1.3 (15)
Bechtel, Dennis A.		RRR000305	1.1.3 (15), 3.4.4 (273), 1.2.6 (27), 1.7.16 (4233), 1.2 (276)
		RRR000981	1.2.1 (72), 1.2 (9), 1.2 (14), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.2.6 (27), 1.7.16 (4233), 1.6.2 (51)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Becker, Rochelle	Alliance for Nuclear Responsibility	RRR000603	1.2 (9), 1.2.1 (55), 1.6.2 (62), 1.2.1 (156), 1.6.2.7 (3014), 1.6.2 (3015), 1.7.14 (4198), 1.6.2.1 (61), 1.3.3 (4168), 1.2 (13)
Beckwith, Nan J.		RRR000589	1.1.3 (15), 1.3.2 (4167)
		RRR000772	1.1.3 (15), 1.7.6 (4178), 1.2.1 (72)
Bedoe, Bev		RRR000960	1.1.3 (15)
Beetem, Jane	CSG Midwest	RRR000655	1.2.3 (25), 1.6.2.5 (155), 1.6.3.2 (176), 1.7.14.1 (3008), 1.7.14.1 (2962), 1.7.14.1 (2961), 1.3.3 (2960), 1.6.2.5 (2907), 1.6.2 (2906), 1.3.1 (2905), 1.6.2.5 (141), 1.6.2.2 (2837), 1.6.2.5 (2836), 1.6.2.5 (2835)
Behrendt, Tim		RRR001033	1.1.4 (16)
Belcastro, Frank		RRR000458	1.1.3 (15)
Benham, Joan		RRR000480	1.1.3 (15)
Benningson, Barbara		RRR000489	1.1.3 (15)
Benti, Wynne		RRR000071	1.1.3 (15), 2.4.1 (413), 2.4.2 (2574), 1.7.15 (3993), 1.3.3 (4168), 1.6.3.2 (176), 1.6.5 (57), 1.11 (416)
		RRR000083 (duplicate of RRR000071)	1.1.3 (15), 2.4.1 (413), 2.4.2 (2574), 1.7.15 (3993), 1.3.3 (4168), 1.6.3.2 (176), 1.6.5 (57), 1.11 (416)
		RRR000238 (duplicate of RRR000071)	1.1.3 (15), 2.4.1 (413), 2.4.2 (2574), 1.7.15 (3993), 1.3.3 (4168), 1.6.3.2 (176), 1.6.5 (57), 1.11 (416)
Berg, Joel		RRR000123	1.1.3 (15)
Berhan, Mary		RRR000625	1.1.3 (15)
Berk, Larry		RRR000193	1.1.3 (15)
Bernard, Larry		RRR000551	1.1.3 (15), 1.3.2 (4167), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36)
		RRR000728	1.1.3 (15), 1.3.2 (4167), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36)
Berrigan, Gail		RRR000763	1.1.3 (15), 1.3.2 (4167)
Berry, Michael		RRR000805	1.1.3 (15), 1.7.6 (4178)
Bertell, Rosalie		RRR000381	1.1.3 (15)
Bess, Jana R.		RRR000136	1.1.3 (15)
Bidwell, Joshua John		RRR000889	1.1.3 (15)
Bigda, Mitch		RRR001027	1.2.1 (72)
Bill, Larson R.	Western Shoshone Defense Project	RRR000686	1.1.3 (15), 1.3.2 (4167), 3.2.4.1 (1750), 1.7.6 (2491), 1.11 (2421), 1.13 (28)
Billmeier, G. J.		RRR000464	1.1.3 (15)
Bilyeu, Jim	Inyo County, Board of Supervisors	RRR000396	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 3.4.4 (36), 3.6.3 (467), 1.6.3.2 (176), 1.6.2 (62), 1.6.2.7 (356), 1.3.3 (4168), 1.3.1 (491), 1.7.6 (477), 1.2 (12), 1.7.3 (479), 1.7.3 (482), 1.7.3 (483), 1.7.3 (484), 1.7.4 (485), 1.7.4 (486), 1.7.4 (487), 1.7.4 (488), 1.7.4 (489), 1.7.4 (492), 1.7.4 (493), 1.7.4 (494), 1.11 (495), 1.12.1 (496)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Bilyeu, Jim (continued)	Inyo County, Board of Supervisors	RRR000521 (duplicate of RRR000396)	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 3.4.4 (36), 3.6.3 (467), 1.6.3.2 (176), 1.6.2 (62), 1.6.2.7 (356), 1.3.3 (4168), 1.3.1 (491), 1.7.6 (477), 1.2 (12), 1.7.3 (479), 1.7.3 (482), 1.7.3 (483), 1.7.3 (484), 1.7.4 (485), 1.7.4 (486), 1.7.4 (487), 1.7.4 (488), 1.7.4 (489), 1.7.4 (492), 1.7.4 (493), 1.7.4 (494), 1.11 (495), 1.12.1 (496)
Binette, Aja	Nuclear Information and Resource Services	RRR000324	1.1.3 (15), 1.6.3.2 (176)
Binzer, Chris	Nuclear Energy Institute	RRR000039	1.1.4 (16), 3.1.4 (69)
		RRR000070	1.1.4 (16), 3.1.4 (69)
		RRR000122	1.1.4 (16), 3.1.4 (69)
Birnie, Patricia T.	Women's International League for Peace and Freedom	RRR000862	1.1.3 (15), 1.3.2 (4167)
Bjork, Nancy J.		RRR000925	1.16 (170)
Black, Leroy G.		RRR000214	1.1.3 (15)
Blackburn, Lee A.		RRR000850	1.1.3 (15)
Blanton, Patricia A.		RRR000185	1.1.3 (15)
Blee, David	U.S. Transport Council	RRR000008	1.1.4 (16)
		RRR000319	1.1.4 (16)
Bliss, Ryan		RRR000371	1.1.3 (15)
Block, Dixie P.		RRR000768	1.1.3 (15), 1.3.2 (4167)
Bloom, Cheryl		RRR000829	1.1.3 (15)
Bloom, Paul		RRR000062	1.1.3 (15)
Blumensaadt, Eric C.	NV Group Sierra Club	RRR000144	1.1.3 (15)
Bodde, Mary A.		RRR000497	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89)
Boeve, May		RRR000380	1.1.3 (15), 1.3.3 (4168), 1.3.2 (4167)
Boisvert, Barbara E		RRR000986	1.1.3 (15)
Boisvert, John H		RRR000988	1.1.3 (15)
Boland, Nancy	Esmeralda County, Nevada, Board of County Commissioners	RRR000395	3.7.1 (4225), 3.4 (24)
Bolduc, William T.		RRR000992	1.1.4 (16)
Bonafine, Julia A.		RRR000946	1.1.3 (15)
Bonds, Julia		RRR000403	1.7.6 (4178), 1.7.3 (172), 1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (175), 2.4.1 (41), 3.4.4 (36), 1.4.1 (49), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.4.2 (42), 3.2.4.2 (7), 1.6.2 (51)
Bongochi, Monty	Monache Alliance	RRR000096	1.1.3 (15)
Booe, Kenneth C		RRR000968	1.1.4 (16), 1.8.1 (33), 1.12.2 (160)
Borasky, Butch	Nye County, Board of Commissioners	RRR000055	1.2.4 (26)
Border, Myram		RRR000819	1.1.3 (15)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Bourgoin, Ron C.		RRR000140	1.7.16 (4233)
Boutis, Kathleen		RRR000857	1.1.3 (15)
Bowen, Dora A.		RRR000993	1.1.3 (15)
Bowman, Brent		RRR000528	1.1.3 (15)
Boyce, James		RRR000793	1.1.3 (15), 1.3.2 (4167)
Boyd, Benedict		RRR000074	3.7.11 (232), 3.1.4 (69)
Boyd, James D.	California Energy Commission	RRR000642	1.2.1 (156), 1.2 (12), 1.4.1 (49), 1.7.14.1 (3348), 1.7.14.1 (3615), 1.7.14 (3616), 1.7.14 (3661), 1.7.14 (3662), 1.12.1 (3663), 1.6.2 (51), 1.11 (3703), 1.6.3.2 (176), 1.7.14.1 (3706), 1.7.14.1 (3744), 1.7.14.1 (3746), 1.7.14.1 (3747), 1.7.4 (3749), 1.12.1 (84), 1.6.3 (73), 1.6.3 (74), 1.3.3 (4168), 1.7.7 (4230)
Boydston, Donald	Concern Citizens of Amargosa Valley	RRR000104	1.3.1 (577)
Brager, Susan	Clark County	RRR000270	1.1.3 (15), 1.7.15 (4056), 1.3.1 (3829)
Bravo, Eliseo Lopez		RRR000797	1.1.3 (15), 1.3.2 (4167)
Brooks, Eric		RRR000411	1.1.3 (15)
Broth, Mitchell		RRR001010	1.1.3 (15)
Brown, Diana		RRR000518	1.1.3 (15)
Brown, Merleen		RRR000519	1.1.3 (15)
Brown, Richard H.		RRR000024	1.1.3 (15), 3.7.8 (3497), 1.6.1 (67), 1.8.1 (33)
Brown, Shiela		RRR001011	1.7.7 (3371)
Brune, Mike	Rainforest Action Network	RRR000705	1.1.3 (15), 1.3.2 (4167)
Brunner, Demise		RRR001047	1.1.3 (15)
Brush, Deray		RRR000132	1.1.4 (16)
		RRR000257	1.1.4 (16)
Bullock, Mary L.		RRR000864	1.16 (170)
Buonaiuto, Shelley		RRR000684	1.1.3 (15), 1.3.2 (4167)
Burkland, Monica		RRR001014	1.1.3 (15)
Burley, Silvia	California Valley Miwok Tribe	RRR000751	1.1.3 (15), 1.3.2 (4167)
Burris, Laurence		RRR000511	1.1.3 (15)
Burton, Brandon C.		RRR000198	1.1.3 (15)
Bush, Pat E.		RRR000787	1.1.3 (15), 1.3.2 (4167)
Bute, Holly M.		RRR000336	1.1.3 (15)
Byron, Barbara	State of California, California Energy Commission	RRR000043	1.2.1 (156)
		RRR000108	1.2.1 (156), 1.6.2 (52), 1.6.3.2 (176), 1.6.2 (62), 1.7.4 (532), 1.7.7 (4230), 1.6.5 (56), 1.6.2.7 (3987)
Calabro, Richard A.		RRR000818	1.1.3 (15)
Cameron, Jan		RRR000105	2.1.4 (71), 1.3.1 (2782), 3.4 (584)
Campbell, Hugh		RRR000211	1.1.3 (15)
Carey, Corinne F.		RRR000361	1.1.3 (15)
Carlson, Gertrude		RRR001066	1.1.3 (15)
Carnine, Berkley		RRR000747	1.1.3 (15), 1.3.2 (4167)
Carroll, Richard		RRR000405	1.1.3 (15)
Carter, C.		RRR000457	1.1.3 (15)
Casal, Jan R.		RRR000951	1.12.2 (160)
Cashel, Kathleen		RRR000556	1.1.3 (15), 1.3.2 (4167)

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Cashell, Robert A.	City of Reno	RRR000314	1.1.3 (15), 3.4.2 (669)
		RRR000680	1.2 (9), 1.2 (4), 1.1.3 (15), 1.2 (12), 3.4.2 (2040), 3.4.2 (2067), 1.7.14.2 (4180), 1.7.14.2 (2072), 1.7.14 (2074), 1.2.6 (27)
Cast, Dom		RRR000126	1.1.3 (15), 1.4.4 (29)
		RRR000127	1.4.6 (31)
Castleberry, George		RRR000731	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Castro, Alchesay Rinaldi		RRR000546	1.1.3 (15)
Cecil, Pat		RRR000091	1.7.7 (4230), 1.7.4 (325), 1.6.2 (62), 1.6.3.2 (175), 1.7.15 (3994)
Cervantes, Richard	Inyo County, Fifth District	RRR000080	1.16 (170)
Cesena, Frank		RRR000018	3.1.3 (53), 1.1.3 (15)
Chalmers, Lois	Institute for Energy and Environmental Research	RRR000676	1.9 (76)
Chancellor, Denise	State of Utah	RRR000677	1.2.1 (55), 1.6.1 (67), 1.6.3.2 (176), 1.6.2.5 (163), 1.6.3 (70), 1.6.3.2 (175), 1.7.15 (1937), 1.7.15 (1936), 1.6.2 (52), 1.6.2 (1934), 1.7.12 (1933), 1.3.1 (4169), 1.3.1 (1906), 1.7.8 (1905), 1.7.7 (1904), 1.7.11 (1903), 1.7.4 (1874), 1.7.11 (1873), 3.7.2 (1872), 2.7.7 (1871), 1.7.14 (1870), 3.7.4.2 (1869), 1.7.17 (4145)
Chandler, Stuart M.		RRR000758	1.1.3 (15)
Chang, Claire		RRR000874	1.2 (9), 1.1.3 (15)
Chapin, Chuck	Lander County, Board of Commissioners	RRR000646	3.12 (139), 1.7.14 (4183), 3.2.1 (47), 1.7.14.2 (4162), 1.7.14.2 (2034), 3.4.6 (99), 1.7.14 (1725), 1.11 (4191), 3.12 (139), 3.7.7 (81), 1.7.14 (4192), 1.7.14 (1997), 2.4.2 (1931), 2.4.4 (37), 2.2.1 (43), 2.4.1 (1995), 2.7.1 (1724), 2.7.7 (4164), 2.11 (4182), 2.15 (147), 1.7.14 (1986), 3.15 (1985), 3.1.2 (2), 3.4.5 (1983), 3.6.4 (1982), 2.4.2 (145), 2.2 (1980), 2.6 (1946), 2.4.1 (151), 2.4.6 (1913), 3.4.3 (1912), 2.7.7 (4175), 2.7.1 (1720), 2.7.1 (1910), 2.7.4 (1908), 2.15 (1879), 2.7.1 (1841), 2.7.1 (1839), 2.7.4 (54), 1.7.14 (4183), 2.7.7 (4175), 2.2.5 (2690), 2.7.7 (2689), 2.7.7 (4173), 2.7.7 (4173), 2.7.7 (4164), 2.11 (1701), 3.6 (132), 2.11 (1697), 3.3.2 (161), 3.7.1 (116), 3.11 (1523), 3.7.7 (63), 3.7.7 (1532), 3.11 (1531), 3.11 (4170), 3.11 (4170), 3.11 (1528), 3.11 (1526), 3.11 (1525), 3.11 (1523), 3.11 (4171)
Chase, Jim		RRR000388	1.14 (539)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Chelette, Iona		RRR000550	1.7.14 (4198), 1.7.13 (2145), 1.1.3 (15), 1.6.2 (2148), 1.7.12 (1751), 1.4.6 (31), 1.6.2 (52), 1.7.13 (171), 1.7.12 (1637), 1.8.1 (33), 1.6.2.1 (61), 1.6.3.2 (1640), 1.3.1 (1641), 1.6.1 (67), 1.3.1 (1658)
Chester, Greg		RRR000406	1.3.2 (4167)
Chiucarello, Ed		RRR000461	1.1.3 (15)
Chozahinoff, Barbara		RRR001009	1.1.3 (15)
Christian, Amy		RRR000698	1.1.3 (15), 1.3.2 (4167)
Christiansen, Holly		RRR000717	1.1.3 (15)
Christine, Alexi		RRR000794	1.1.3 (15), 1.3.2 (4167)
Clark, Al		RRR000031	1.1.4 (16)
Clark, Robert R.		RRR000309	1.1.3 (15)
Clementsen, Ron	Caliente BLM Field Office	RRR000017	3.2.4.1 (629)
Clemons, Ronald D.		RRR000230	1.1.4 (16)
Cohen, Albert G.	Southern California Ecumenical Council	RRR000483	1.1.3 (15)
Cohen, Isabel/Carl		RRR000474	1.1.3 (15)
Cole, Jan		RRR000014	3.2.5 (166), 3.7.1 (2300), 3.2.6 (94), 1.7.14.2 (3988)
		RRR000292	3.4.1 (21), 3.2.5 (166)
Colleen		RRR001025	1.1.4 (16)
Collins, Nicola M.		RRR000984	1.1.3 (15)
Collins-Ranadive, Gail		RRR000349	1.4.4 (29)
Colvin, Tom	Colvin & Sons, LLC	RRR000665	3.2 (11), 3.12 (139), 3.2.4.1 (17), 3.7.1 (4185)
Comnes, Barbara M.		RRR000640	1.1.3 (15)
Conley, Jack B.		RRR000183	1.1.4 (16)
Conroy, Barbara		RRR000711	1.1.3 (15), 1.3.2 (4167)
Cooley, Marian		RRR000487	1.1.3 (15), 1.6.2.1 (61)
Cooper, William R.		RRR001022	1.1.4 (16)
Cooper-Vasquez, Lori		RRR001002	1.1.3 (15)
Corbett, Patrick J.		RRR000644	1.1.3 (15)
Corcoran, David		RRR000493	1.1.3 (15)
Corneli, Helen M		RRR000869	1.2 (9)
Corson, Jamie		RRR000379	1.1.3 (15)
Corwin, Stanley		RRR000752	1.1.3 (15), 1.3.2 (4167)
Coulter, Krista	State of Nevada, Dept. of Administration	RRR000450	1.16 (170)
		RRR000451	2.16 (755)
Covington, Cathy		RRR000492	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Cowan, James R.		RRR000148	1.1.3 (15)
Cox, Mike		RRR000921	1.1.3 (15), 1.3.2 (4167)
Cravens, Marisa E.		RRR000650	1.1.3 (15), 1.7.7 (4231)
Crawford, B. J.		RRR000311	1.1.3 (15)
Credille, Ellen L.		RRR000582	1.1.3 (15)

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Cullen, Noreen P.		RRR000475	1.1.3 (15), 1.6.2.1 (61)
Curran, John		RRR000801	1.1.3 (15), 1.7.6 (4178)
Curtis, David		RRR000416	1.1.3 (15)
Curtis, Steven P.	Alphatech, Inc.	RRR000137	1.1.4 (16)
Cuzze, Donna		RRR001086	1.7.15 (4214)
Cuzze, Ron		RRR001085	1.1.3 (15)
D'Aquanni, Beverly Ann		RRR000514	1.1.3 (15)
Daboda, Darren	Moapa Band of Paiutes	RRR000272	1.1.3 (15)
Daggett, Becky		RRR000733	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Dalton, Eric M.		RRR000970	1.1.4 (16)
Damaschke, Jon		RRR000803	1.1.3 (15), 1.7.6 (4178)
Dannenberg, Andrew L.	Center for Disease Control and Prevention, Dept. of Health and Human Services	RRR000452	3.7.8 (830)
		RRR000454	1.7.8 (942)
		RRR000453	2.7.8 (936)
Daum, Chris		RRR000604	1.1.3 (15)
Davies, William		RRR000792	1.1.3 (15), 1.3.2 (4167)
Davis, Grace J.		RRR000312	1.1.3 (15)
Davis, Thomas M.		RRR000738	1.1.3 (15)
Day, Alice T.	Council for a Livable World	RRR000643	1.1.3 (15)
Day, Elena		RRR000486	1.1.3 (15)
DeKlever, Richard		RRR000223	1.1.4 (16), 1.3.3 (885), 1.8.1 (33), 1.3.3 (3713)
		RRR000315	1.1.4 (16), 1.8.1 (33), 1.3.3 (4228)
		RRR001000	1.2.1 (72), 1.3.3 (4228)
DeLee, Michael		RRR000065	1.2 (12)
DeMare, Joseph		RRR000595	1.1.3 (15), 1.6.2.1 (61), 1.6.3.2 (176)
DePauw, Jolie Diane		RRR000852	1.1.3 (15), 1.3.2 (4167), 1.7.4 (89), 1.6.3.2 (176)
DeVries, Laura		RRR000554	1.1.3 (15)
DeWitt, Ellen		RRR000901	1.1.3 (15)
Dean, David		RRR000222	1.1.4 (16)
Delucchi, Joy		RRR000421	1.1.3 (15)
Detweiler, Donna		RRR000539	1.1.3 (15)
Devers, Ann W.		RRR000709	1.1.4 (16)
Devine, Don		RRR000459	1.1.3 (15), 1.3.2 (4167), 1.7.4 (89)
DiSalvo, Nicole S.		RRR000704	1.1.3 (15), 1.3.2 (4167)
Dias, Michael		RRR000342	1.1.3 (15)
Dickison, Thomas D.		RRR000348	1.1.4 (16)
Dickman, Elizabeth		RRR000548	1.1.3 (15)
Dillion, Teri		RRR000561	1.1.3 (15), 1.3.2 (4167)
Dillon, Mary		RRR000215	1.1.3 (15)
Dilorenzo, M. D.		RRR000182	1.1.3 (15)
Dodge, Katharine	Northeast Pa. Audubon Society	RRR000876	1.1.3 (15), 1.3.2 (4167)

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Donham, Mark	Regional Association of Concerned Environmentalists (RACE)	RRR000935	1.2 (9), 1.2 (9), 1.3.2 (4167), 1.7.4 (150), 1.7.8 (3793), 1.2.6 (27), 1.1.3 (15)
Donn, Marjory/Bertram		RRR000516	1.1.3 (15)
Donovan, Mary		RRR000817	1.1.3 (15)
Douglass, Robert L.		RRR000501	1.1.3 (15)
Downey, J.		RRR000197	1.1.3 (15)
Drew, Robin		RRR000282	1.16 (230)
Drey, Kay		RRR000708	1.1.3 (15)
Drost, Edward J.		RRR000334	1.1.4 (16)
DuBois, Gwen L.		RRR000890	1.1.3 (15)
Duarte, Gary	US Nuclear Energy	RRR000037	1.1.4 (16)
		RRR000281	1.1.4 (16)
Duffy, Diana		RRR000830	1.1.3 (15)
Dukelow-Burton, Darlene		RRR000431	1.1.3 (15)
Dumont, Nellie		RRR000482	1.1.3 (15)
Duncil, Bruce R.		RRR000503	1.1.3 (15)
Dunn, Kim		RRR000547	1.16 (170)
Durante, Charles T.		RRR000429	1.1.3 (15), 1.3.2 (4167)
Durham, Barbara		RRR000067	1.7.14 (4192), 1.7.4 (4195), 3.7.7 (48)
Durham, Barbara		RRR000102	3.7.8 (364)
Dye, Patsy L.		RRR000990	1.1.3 (15)
Dyken, Carl		RRR000063	1.1.3 (15)
Dyken, Mark		RRR000350	1.1.3 (15)
Dziegiel, Henry		RRR000226	1.1.3 (15), 1.13 (28)
		RRR000264	1.3.1 (3715)
		RRR000284	1.1.3 (15)
Earl, Gretchen		RRR000343	1.1.3 (15)
Eastley, Joni	Nye County, Board of County Commissioners	RRR000054	1.2.4 (26)
		RRR000240	1.2.4 (26)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Eastley, Joni (continued)	Nye County, Board of County Commissioners	RRR000656	3.4.3 (1), 3.2 (1239), 3.4.6 (98), 3.4.6 (1241), 3.1.2 (2), 3.4.6 (1362), 3.7.8 (1327), 3.4.4 (36), 3.12 (139), 3.2.3 (59), 3.11 (1334), 2.7.8 (1335), 2.7.8 (1336), 2.7.8 (1337), 2.7.8 (1338), 2.7.8 (1345), 2.7.8 (1347), 2.2 (1350), 2.1.2 (1405), 2.1.1 (1406), 1.6.2 (1395), 3.4.6 (99), 2.7.7 (1397), 2.4.7 (1398), 2.7.7 (1399), 2.7.7 (1400), 1.7.1 (1404), 1.7.1 (1416), 2.11 (1419), 2.11 (1422), 2.11 (1428), 1.7.14.2 (1432), 2.11 (1434), 2.11 (1436), 2.11 (1437), 3.6.2 (131), 3.6 (92), 3.6 (120), 3.7.12 (1499), 3.6.2 (127), 3.4.3 (1502), 3.4.1 (1504), 3.7.7 (80), 3.7.7 (1506), 3.7.8 (1507), 3.7.12 (1508), 3.1.2 (3), 3.4.6 (1511), 3.7.3 (1470), 3.7.1 (1487), 3.7.4.1 (1491), 3.12 (4186), 3.7.4.2 (1496), 3.7.5 (1498), 3.6.2 (88), 3.7.8 (1620), 3.7.8 (1537), 3.15 (1541), 3.7.8 (1698), 3.7.8 (1702), 3.7.8 (1775), 3.7.8 (1803), 3.7.3 (1717), 3.11 (1837), 3.11 (4174), 3.4.3 (1876), 1.6.2.5 (1941), 3.11 (1942), 3.11 (1979), 2.7.7 (4175), 3.15 (1994), 3.7.8 (1996)
		RRR000657	1.7.7 (1793), 1.12.1 (1696), 1.2.1 (46), 1.7.7 (1694), 1.2 (111), 1.6.3.2 (1792), 1.2.4 (26), 1.7.7 (1691), 1.9 (77), 1.7.16 (4234), 1.7.7 (1660), 1.7.7 (1659), 1.7.1 (1767), 1.7.7 (1633), 1.7.7 (2152), 1.7.7 (2151), 1.7.7 (2149), 1.7.8 (2146), 1.7.8 (2131), 1.7.15 (2129), 1.7.15 (1766), 1.11 (1764), 1.6.5 (58), 1.9 (1763), 1.7.8 (1816), 1.7.8 (1814), 1.11 (1790), 1.2.3 (25), 1.12.1 (1789), 1.3.1 (1732), 1.15 (4161), 1.12.1 (1780), 1.7.8 (1757)
Eastling, Matt		RRR000611	1.1.3 (15)
Ebert, Daniel R.	Public Service Commission of Wisconsin	RRR000757	1.1.4 (16), 1.2.1 (72)
Edwards, Carolyn		RRR000251	1.1.3 (15)
Eichbaum, Barlane/Ronald		RRR000233	1.1.4 (16)
Eichbaum, Ike		RRR000051	1.1.4 (16)
Ellen, Linda/Ron		RRR001037	1.1.3 (15)
Emerson, Eric S.		RRR000871	1.3.2 (4167), 1.6.1 (67)
Emmerick, Kevin R.		RRR000555	3.7.4.2 (1563), 3.7.1 (1594), 3.7.5 (1564), 3.7.2 (1565), 3.7.8 (2417), 3.7.8 (2418), 3.4.3 (20), 3.7.6 (1567), 3.7.10 (2478), 3.1.3 (53)
Erb, Cheryl		RRR000634	1.1.3 (15)
Ertelt, Sabrina		RRR000914	1.1.3 (15)
Esparza, Mary Alica		RRR000297	1.1.3 (15)
Esteves, Pauline		RRR000066	3.7.14.1 (387), 3.7.14.2 (2670)
Estey, Kara		RRR000750	1.1.3 (15), 1.3.2 (4167)
Etheridge, Kelly J.		RRR000408	1.1.3 (15)

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Evans, Dinda		RRR000496	1.1.3 (15)
Evans, Jim		RRR000296	1.6.5 (57)
Fairchild, Stephanie M.		RRR000892	1.1.3 (15)
Fallini, Anna	Twin Springs Ranch	RRR000072	3.2 (4144), 3.7.1 (116), 3.14 (2454), 3.2 (11), 3.4.1 (34)
Fallini, Joe B.	Twin Springs Ranch	RRR000710	3.3.2 (161), 3.2.1 (47), 3.7.4.2 (154), 3.7.4.1 (1671), 3.2.5 (167), 3.6.4 (95), 3.7.1 (116), 3.7.1 (117), 3.7.1 (1664), 3.7.10 (1663), 3.7.5 (1645), 3.7.5 (1644), 3.7.5 (1643), 3.7.5 (2158), 3.7.5 (2157), 3.7.5 (2156), 3.7.5 (2137), 3.7.5 (2136), 3.7.9 (2135), 3.6 (112), 3.7.5 (148), 3.2.6 (94), 3.7.1 (2103), 3.7.1 (2101), 3.7.5 (2100), 3.7.4.2 (2098), 3.7.4.2 (140), 3.7.4.2 (2077), 3.7.4.2 (2076), 3.6.3 (85), 3.7.5 (158), 3.7.5 (2000), 3.7.5 (2066), 3.7.5 (1999), 3.7.9 (3045), 3.7.7 (4138), 3.7.7 (79), 3.7.11 (1998), 3.11 (1956), 3.11 (1955), 3.3.3 (2063), 3.3.3 (1954), 3.12 (139), 3.12 (4186)
Fallini, Joe	Twin Springs Ranch	RRR000075	1.1.3 (15), 1.6.2 (52), 3.2 (237), 1.4.6 (31), 3.7.8 (2415)
Fancher, Clyde C.		RRR001079	2.4.2 (4027), 2.4.7 (4030), 2.4.6 (4092), 1.1.4 (16)
Farias, Corinne		RRR000424	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89)
Farm, D.W.		RRR001004	1.1.3 (15)
Fazzalaro, Mary		RRR000243	1.1.3 (15)
Feder, Malina		RRR000366	1.1.3 (15)
Felich, Tara		RRR000748	1.1.3 (15), 1.3.2 (4167)
Fellows, Kevin		RRR000332	1.2 (9), 1.1.3 (15)
Fellows, Richard M.		RRR000900	1.6.2.1 (61)
Filippini, Hank	N-6 State Grazing Board	RRR000687	3.1.3 (53), 3.2.1 (47), 3.7.1 (116), 3.7.1 (1845), 3.6 (93), 3.6 (105), 3.6.3 (96), 3.6.2 (130), 3.6 (129), 3.6 (132), 3.6 (120), 3.12 (139), 3.6 (133), 3.7.1 (1952), 3.2.5 (167), 3.7.1 (117), 3.6.3 (85), 3.7.4.2 (2114), 3.12 (4186), 3.6 (109), 3.11 (4172), 3.7.1 (118), 3.8 (1651), 3.6 (107)
Filmore, Laura		RRR000048	1.1.3 (15)
Finch, David A.		RRR000155	1.1.4 (16)
Fine, Bill		RRR000053	1.1.3 (15)
Fitzell, Anne Marie		RRR000592	1.1.3 (15), 1.3.2 (4167)
Flake, Merlin R.	N-4 State Grazing Board	RRR000621	3.7.1 (116), 3.2.4 (19), 3.2.1 (47), 3.7.1 (1427), 3.6 (129), 3.12 (139), 3.6 (93), 3.6.2 (122), 3.6.3 (108), 3.4.3 (1375), 3.2.5 (167), 3.7.1 (117), 3.11 (4172), 3.7.1 (118), 3.6 (107), 3.6 (109), 3.6.3 (96), 3.6.2 (130), 3.6 (133), 3.6 (120), 3.6 (105), 3.6 (132), 3.7.4.2 (1443), 3.12 (4186)
Fleming, Jay	J&K Expo	RRR000130	1.1.3 (15)
Flores, Gabriel/Raven		RRR000811	1.1.3 (15), 1.7.6 (4178)
Fofrich, Robert		RRR000802	1.1.3 (15), 1.7.6 (4178)
Follins, Bryan		RRR000584	1.1.3 (15)
Foreman, Mary Jo		RRR000167	1.1.3 (15)

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Foremaster, Judd		RRR000253	3.4.1 (34)
Foremaster, Kelly		RRR000254	3.4.1 (34)
Fought, Dale	D.C. Minerals, Inc.	RRR000814	3.4 (24)
Fowler, Ed	Mineral County, Board of Commissioners	RRR000682	3.2.1 (47), 1.7.14.2 (4162), 1.7.14.2 (2034), 3.4.6 (99), 1.7.14 (2032), 1.7.14 (1725), 1.11 (4191), 3.12 (139), 3.7.7 (81), 1.7.14 (4192), 1.7.14 (1997), 2.4.1 (1995), 2.7.1 (1724), 2.7.7 (4164), 2.11 (4182), 2.15 (147), 1.7.14 (1986), 3.15 (1985), 3.1.2 (2), 3.4.5 (1983), 3.6.4 (1982), 2.4.2 (145), 2.2 (1980), 2.6 (1946), 2.4.1 (151), 2.4.6 (1913), 3.4.3 (1912), 2.7.1 (1720), 2.7.1 (1910), 2.7.4 (1908), 2.15 (1879), 2.7.1 (1841), 2.7.1 (1839), 2.7.4 (54), 2.7.4 (2697), 2.7.4 (2696), 2.7.4 (2695), 2.7.4 (2694), 2.7.6 (2693), 2.2.5 (2690), 1.7.14 (4183), 2.7.7 (4175), 2.7.7 (2689), 2.7.7 (4173), 2.11 (1701), 3.6 (132), 2.11 (1697), 3.3.2 (161), 3.7.1 (116), 3.7.7 (63), 3.7.7 (1532), 3.11 (1531), 3.11 (4170), 3.11 (1528), 3.11 (1526), 3.11 (1525), 3.11 (1523), 3.11 (4171)
Fox, Vicki		RRR000495	1.1.3 (15), 1.6.2.1 (61)
Fox, William/Myrna		RRR000926	1.3.2 (4167), 1.1.3 (15)
Francia, Carol		RRR000541	1.1.3 (15)
Freedlund, Mary M.		RRR000630	1.1.3 (15)
Freeman, Fred H.		RRR000212	1.1.4 (16), 1.7.15 (4054)
Freeman, Jacqueline		RRR000530	1.1.3 (15)
Freeman, Lu		RRR000026	1.1.3 (15)
Fretheim, Paul		RRR000093	1.1.3 (15), 1.2.6 (27)
Friedman, Judi		RRR000463	1.1.3 (15)
Frishman, Steve	Nevada Agency for Nuclear Projects	RRR000275	1.4.4 (29), 1.2 (111), 1.2 (9)
Frost, Debra		RRR000001	1.1.3 (15)
Fujiyoshi, Ronald S.		RRR000724	1.1.3 (15), 1.3.2 (4167)
Fuller, Ernest		RRR000870	1.1.3 (15)
Futrell, Susan		RRR000585	1.1.3 (15)
Gaffney, Matt	Inyo County, Yucca Mountain Repository Assessment Office	RRR000059	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 1.7.7 (626), 1.4.1 (49)
		RRR000082	1.7.4 (3708), 1.3.3 (4168), 1.7.7 (4230), 1.4.6 (31), 1.6.3.2 (176), 1.7.13 (171)
		RRR000239	1.7.4 (4188), 1.7.4 (4189), 1.12.1 (84), 1.7.7 (4230), 1.4.1 (49), 1.7.15 (3907), 1.6.2 (62), 1.6.3.2 (176), 1.7.7 (626)
Gagnon, Lisa		RRR000540	1.3.2 (4167), 1.7.4 (89), 1.7.14 (2839), 1.6.3 (73), 1.6.5 (56), 1.7.3 (172), 1.3.3 (2843)
Gaia, Fabiana G.		RRR000337	1.1.4 (16), 1.6.5 (56)
Gallagher, Sarah Woodside		RRR000654	1.1.3 (15)
Ganson, Mike		RRR000242	1.1.3 (15)
Garcia, Jeffery		RRR000821	1.1.3 (15)
Gardipe, Janice	Western Shoshone	RRR000052	1.1.3 (15)

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Gardner, Jean		RRR000432	1.1.3 (15)
Garison, Ann		RRR000414	1.1.3 (15)
Garrett, Jo Anne		RRR000694	1.1.3 (15), 1.3.3 (4168), 3.2 (3387)
Garriott, Helen M.		RRR000333	1.1.3 (15)
Garrison, Ann		RRR000409	1.1.3 (15)
Garry, Rebecca		RRR000355	1.1.3 (15)
Garvey, Lydia		RRR000527	1.1.3 (15)
Geno, Debbie		RRR000500	1.1.3 (15)
Gentry, Don		RRR000559	1.1.3 (15)
Gere, Kathy		RRR000624	1.6.2.1 (61), 1.1.3 (15)
Gerstung, April S.		RRR000648	1.1.3 (15)
Getty, G.	Nuremberg Actions	RRR000022	1.1.3 (15)
Gibson, Joyce		RRR000437	1.1.3 (15)
Giese, Mark M.		RRR000574	3.2.1 (47), 3.4.2 (42), 3.2.4.2 (7), 1.6.2 (51)
Gillette, Karl/Joan		RRR000983	3.1.3 (53)
Gilliam, Lynnette M.		RRR000949	1.1.4 (16)
Gillum, Rita		RRR000079	3.7.7 (64)
Gilmore, Roseann		RRR001061	1.1.3 (15)
Gitersonke, Don		RRR000194	1.1.3 (15)
Givens, Nancy		RRR000479	1.3.2 (4167), 1.6.5 (57), 1.6.2.2 (1886), 1.7.8 (1887), 1.2.6 (27), 1.4.5 (30), 1.7.15 (4058), 1.4.4 (29), 1.1.3 (15)
Glenn, Rob		RRR000370	1.1.3 (15)
Globerle, W.		RRR000393	1.1.3 (15)
Godfrey, Marci T.		RRR000163	1.1.4 (16)
Godinez, Jacob		RRR000789	1.1.3 (15), 1.3.2 (4167)
Goit, John		RRR000097	1.1.4 (16)
Goodison, Jason		RRR000776	1.1.3 (15), 1.3.2 (4167)
Goodman, Miriam	Mid-Island Radiation Alert	RRR000608	1.1.3 (15)
Goodman, Oscar	City of Las Vegas, Mayor	RRR000266	1.1.3 (15)
Govan, Michael	Los Angeles County Museum of Art	RRR000433	3.4.1 (35)
Grant, Abbie		RRR000954	1.1.3 (15)
Grant, Patrick		RRR000741	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Gray, Charles D.	National Association of Regulatory Utility Commissioners (NARUC)	RRR000525	1.3.1 (1857), 1.7 (1858), 1.15 (4161), 1.3.3 (1860), 1.3.1 (1861), 1.2.1 (1862), 1.6.3.2 (1865), 1.2.4 (1894), 1.11 (1895), 1.6.2 (1897), 3.4.3 (1), 1.7.8 (1899), 1.7.16 (4234), 1.3.3 (1737), 1.4.4 (29), 1.11 (1929), 1.3.1 (1932), 1.6.2 (1959), 3.1 (1962), 3.4 (1966), 1.6.3.2 (176), 1.6.2 (164), 2.4.1 (41), 3.4.6 (98), 2.4.2 (2051), 3.4.5 (2054), 3.4.5 (2055), 3.7.7 (2057), 3.4.4 (2059), 3.7.8 (1761), 3.4 (2085)
Greaser, John		RRR000827	1.1.3 (15)
Greco, Tom		RRR000110	1.1.4 (16)
Green, Karen		RRR000565	1.1.3 (15), 1.3.2 (4167)
Green, Morgan		RRR000722	1.1.3 (15)

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Greene, Eileen		RRR000994	1.7.7 (3724), 1.6.2.5 (143), 1.4.6 (31), 1.7.6 (4178)
Greenhaw, Rhonda J.		RRR000520	1.1.3 (15), 1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.4.1 (49), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Grenell, Jason C.		RRR000961	1.1.3 (15)
Griffith, Donna		RRR000633	1.7.6 (4178)
Griffith, Linda		RRR000365	1.3.2 (4167), 1.1.3 (15)
Groom, Warren		RRR000151	1.1.3 (15)
Grote, Jennifer R.		RRR000165	1.1.3 (15), 1.3.2 (4167)
Grover, Ravi		RRR000607	1.7.14 (2239)
Guzman, Tony		RRR000932	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.3.2 (4167), 1.7.4 (150), 1.1.3 (15)
Haas, Shannon		RRR000766	1.1.3 (15), 1.3.2 (4167)
Hadder, John	Healing Ourselves and Mother Earth (HOME)	RRR000046	1.3.2 (4167), 1.2 (10), 3.4.2 (42), 1.3.3 (4168), 1.6.5 (56)
		RRR000737	1.2 (12), 1.2 (9), 1.3.1 (3913), 3.3.2 (1474), 2.2 (1475), 1.6.3.3 (3619), 1.6.3.2 (175), 1.6.3.3 (3620), 1.6.3 (70), 1.11 (4194), 1.2.1 (2387), 1.3.3 (3914), 1.9 (3132), 1.2.1 (113), 1.7.4 (4064), 1.2.1 (72), 1.7.8 (1482), 1.2.6 (27), 1.7.7 (3629), 1.7.7 (2709), 1.9 (4135), 1.9 (4107)
Hagan, Tootie		RRR000400	1.3.2 (4167)
Haggerty, Bernard P.		RRR000872	1.2 (9), 1.1.3 (15), 1.6.1 (67)
Hale, Ann		RRR000494	1.1.3 (15)
Hall, James A.		RRR000744	1.1.3 (15), 1.3.2 (4167)
Hall, Jim	State of Nevada, Agency for Nuclear Projects	RRR000321	1.6.2 (253), 1.6.1 (67), 1.6.3.2 (176), 1.7.14 (4198)
Hall, Tressie		RRR000886	1.1.3 (15)
Halstead, Robert	State of Nevada, Agency for Nuclear Projects	RRR000006	1.2 (10), 1.2.1 (55), 1.6.2.7 (637), 1.7.14 (4198), 3.2.1 (47), 3.4.2 (42), 3.2.4.2 (7), 3.4.4 (36), 3.4.2 (643)
		RRR000013	1.2 (10), 1.2 (12), 1.2.2 (50), 1.2.1 (55), 1.6.2.7 (565), 3.7.1 (566), 3.4.1 (18), 3.12 (139), 1.7.14 (4198), 3.7.1 (117), 3.7.4.2 (140), 3.6.2 (106)
		RRR000038	1.2.1 (55), 3.1.3 (53), 3.4.2 (42), 3.2.4.2 (7), 1.6.2 (51), 1.6.2.5 (163), 1.7.14 (4198)
		RRR000056	1.2 (10), 1.1.3 (15), 1.6.3.2 (175), 3.2.1 (47), 2.4.1 (41), 3.2.4.2 (7), 1.6.2 (51), 3.4.4 (36), 1.6.2.5 (163), 3.7.1 (801), 3.4.1 (18), 3.7.1 (116), 3.7.4.2 (140), 3.6.2 (106), 3.2.4.2 (8)
		RRR000069	1.6.2.7 (815), 3.2.1 (47), 3.4.2 (42), 3.4.1 (18), 3.2.4.2 (8)
		RRR000274	1.1.3 (15), 1.2 (9), 1.6.2.5 (163)
		RRR000322	1.6.2.7 (726)
Halt, Joanne		RRR000723	1.1.3 (15), 1.1.3 (15)
Hamburg, Robert A.		RRR000537	1.1.3 (15)
Hamilton, Mary		RRR000760	1.1.3 (15)

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Hampson, Judith A.		RRR000168	1.1.3 (15)
Hansen, Jean		RRR000196	1.14 (4190)
Hansen, John P.		RRR000023	1.1.3 (15)
Hanson, Art		RRR000467	1.7.3 (172), 1.7.6 (4178), 1.6.3.2 (176)
		RRR000612	1.1.3 (15), 1.6.3.2 (175)
Hanson, Natalie		RRR000468	1.7.3 (172), 1.7.6 (4178), 1.6.3.2 (176)
Hardacker, Tracy L.		RRR000842	1.1.4 (16)
Harden, Cory/Martha		RRR000404	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.4.1 (49), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Harkins, Joanne		RRR000490	1.1.3 (15)
Harm, Christopher W.	United States Department of Commerce	RRR000568	3.16 (2653)
		RRR000569	1.12 (2656)
Hartle, Sherie		RRR000534	1.1.3 (15)
Harvey, Pauline		RRR000942	1.1.3 (15)
Harvey, Vivian		RRR000218	1.1.3 (15)
Haslam, Malissa		RRR000695	1.1.3 (15), 1.3.2 (4167)
Haslett, Dora		RRR000505	1.1.3 (15)
Hatley, Earl		RRR000420	1.6.2.1 (61), 1.3.2 (4167)
Hatt, Greg		RRR000795	1.1.3 (15), 1.3.2 (4167)
Haustermanns, Josine		RRR000596	1.1.3 (15)
Hawkins, Keith		RRR000141	1.1.4 (16)
Hayes, Sara	SENAA West	RRR000746	1.1.3 (15), 1.3.2 (4167)
Haymaker, Annie		RRR000506	1.3.2 (4167), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2 (51), 1.6.2.1 (61), 1.7.16 (4233)
Headington, Maureen K.		RRR000974	1.1.3 (15)
		RRR000975	1.1.3 (15)
		RRR000977	1.1.3 (15)
Headington, Vincent		RRR000815	1.2.6 (27)
Heil, Darla	Owens Valley Indian Commission	RRR000100	1.2 (9), 1.7.7 (4230), 1.7.4 (4195), 1.6.2.1 (61), 1.7.18.2 (332)
Heinonen, Valerie	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk	RRR000933	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.3.2 (4167), 1.6.3 (74), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Heizer, Michael	Triple Aught Foundation	RRR000674	3.4.1 (35), 3.2 (1830)
Helfenstein, Josef	The Menil Collection	RRR000683	3.4.1 (35)
Hellman, Codie		RRR000139	1.1.3 (15), 1.7.16 (4233)
Henderson, Matt		RRR001048	1.1.4 (16)
Hendrick, Paula		RRR000626	1.1.3 (15)
Henning, Bill		RRR001018	1.6.2.1 (61)
Herbst, Jeff		RRR000498	1.1.3 (15)
Hernesman, Barbara		RRR000908	1.1.3 (15), 1.3.2 (4167)

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Higginbotham, James/Joyce		RRR001040	1.1.4 (16)
Higginson, Judy Ann		RRR000928	1.1.3 (15), 1.3.2 (4167)
Hilfer, Eric S.		RRR000645	1.2 (9), 1.1.3 (15)
Hill, Gayle		RRR000225	1.1.4 (16)
		RRR000244	1.1.4 (16)
Hodges, Bennie	Humboldt River Basin Water Authority	RRR000029	1.2 (60), 2.4.1 (41)
Hollis, Charles Gary		RRR000004	1.1.4 (16)
Hollis, Gary	Nye County, Board of County Commissioners	RRR000081	1.2.4 (26)
		RRR000271	1.2.4 (26)
		RRR000320	1.2.4 (26)
Holmes-Litvak, Veronika J.		RRR001029	1.6.2.1 (61)
Holzberg, Steve		RRR000491	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Hornbeck, David A.	Hornbeck Law Office	RRR000192	1.4.4 (29), 1.7.16 (4233)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Hornbeck, Ronda	Lincoln County, Nevada, Board of County Commissioners	RRR000617	1.2.2 (50), 1.3.3 (1000), 3.2 (11), 1.2.1 (55), 1.3.3 (1003), 1.9 (97), 1.12 (162), 1.12 (4187), 3.2.4 (1009), 1.2 (14), 3.6 (120), 1.1 (961), 2.4.7 (962), 1.4.1 (49), 1.1 (964), 1.7.8 (965), 2.4.7 (82), 1.6.2 (51), 1.7.14 (971), 1.12 (975), 1.12 (976), 2.1.1 (977), 2.2.4 (979), 2.1 (1033), 2.4.4 (37), 2.2.1 (43), 3.1.1 (1043), 3.2.4.1 (1047), 3.2.4.2 (1048), 3.12 (139), 3.4.7 (1051), 3.2 (1053), 3.4.6 (1058), 3.3.2 (161), 3.15 (1060), 3.4.3 (1061), 3.4.3 (1010), 3.6.2 (131), 3.6.2 (130), 3.4.5 (1014), 3.6.2 (122), 3.12 (4186), 3.4.1 (1021), 3.15 (152), 3.6.2 (102), 3.6 (92), 3.6.2 (91), 3.7.1 (1027), 3.7.1 (1028), 3.7 (1030), 3.3.2 (1031), 3.6.3 (1032), 3.6.3 (85), 3.6.3 (96), 3.6.2 (1091), 3.6 (132), 3.7.4.2 (1095), 3.6.3 (1102), 3.6.2 (106), 3.6.2 (88), 3.6.3 (110), 3.6.3 (1105), 3.6.3 (86), 3.6.4 (1063), 3.6 (133), 3.6.4 (126), 3.6.4 (83), 1.6.2.5 (1069), 3.4.1 (1071), 3.4.7 (78), 3.4.7 (1075), 3.7 (1079), 3.7.1 (118), 3.2.5 (167), 3.7.7 (79), 3.7.2 (1088), 3.7.3 (1089), 3.7.3 (1081), 3.7.3 (1082), 3.7.1 (1083), 3.7.3 (1084), 3.7.1 (116), 3.7.5 (1131), 3.7.3 (1133), 3.7.3 (1134), 3.7.1 (117), 3.7.1 (1136), 3.7.2 (114), 3.7.4.1 (174), 3.7.4.1 (1140), 3.7.4.2 (1141), 3.7.4.1 (115), 3.7.4.2 (1143), 3.7.5 (1144), 3.7.5 (1145), 3.7.5 (148), 3.7.5 (1147), 3.7.7 (1150), 3.6.3 (1155), 3.6 (112), 3.6 (93), 3.7.7 (1159), 3.7.10 (1162), 3.2.6 (94), 3.7.3 (1119), 3.7.3 (1120), 3.7.3 (1121), 3.7.1 (1123), 3.7.1 (1127), 3.7.1 (1200), 3.7.1 (1202), 3.7.10 (1204), 3.7.10 (1205), 3.7.10 (1206), 3.6.2 (87), 3.7.4.1 (1211), 3.7 (1213), 3.7.4.2 (140), 3.7.4.2 (154), 3.7.4.2 (159), 3.7.4.2 (1216), 3.7.4.2 (1217), 3.7.4.2 (1218), 3.7.4.2 (1168), 3.7.4.2 (1170), 3.7.5 (1171), 3.7.5 (1194), 3.7.5 (1197), 3.7.5 (1198), 3.6.2 (90), 3.7.7 (64), 3.7.7 (63), 3.7.7 (1191), 3.7.7 (1193), 3.6 (177), 3.3.1 (169), 3.7.8 (1301), 3.7.8 (1304), 3.11 (1307), 3.11 (4172), 3.11 (1310), 3.11 (1311), 3.11 (1312), 3.11 (1314), 3.11 (1315), 3.11 (1316), 3.11 (1318), 3.6.4 (95), 3.11 (1321), 3.11 (1323), 3.7.8 (1222), 3.8 (1356), 3.8 (1353), 3.8 (1354), 3.8 (1355), 3.8 (1357), 3.8 (1359), 3.2 (1360), 3.2 (1361), 1.6.2 (1363), 1.6.2 (1364), 1.6.2 (1365), 3.2 (1366), 3.4.4 (36), 2.2 (1368), 3.7.8 (1369), 3.7.5 (1370), 3.7.7 (48), 1.3.1 (1324), 3.7.7 (66), 3.2 (1328), 3.7.2 (1330), 3.7.8 (1331), 3.2.1 (47), 1.3.1 (4169), 3.6 (105), 3.8 (4226), 3.8 (4227)
Houck, Sherry		RRR000754	1.1.3 (15)

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Houston, James N.		RRR000985	1.6.2.1 (61)
Hovey, Kenneth		RRR000245	1.1.4 (16)
Huber, Melissa		RRR000824	1.1.3 (15)
Hudig, Dorothy		RRR000145	1.4.4 (29), 1.7.16 (4233)
		RRR000307	1.4.4 (29), 1.7.16 (4233)
Huet-Vaughn, Yolanda		RRR000599	1.1.3 (15)
		RRR000878	1.1.3 (15)
Huffman, Garrett		RRR000786	1.1.3 (15), 1.3.2 (4167)
Hulbert, Dan		RRR001053	1.1.4 (16)
Huston, John		RRR000015	1.2 (12), 3.1.2 (604), 3.4.3 (605), 1.7.15 (606)
Huston, Jon		RRR000298	3.4.1 (21), 3.4.3 (20)
Huston/Cole, John/Jan		RRR000317	2.4 (65), 3.4.1 (21), 3.2.1 (47), 3.7.3 (173), 1.6.2.7 (3699), 3.7.4.1 (174), 3.4.1 (3737), 1.7.15 (3738), 3.4.1 (3739), 3.7.7 (3740), 2.15 (146), 1.7.14 (4198), 3.2.5 (166), 2.2 (32)
Illegible		RRR000573	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Illo, Dana		RRR000446	1.1.3 (15)
Irizarry, Mesha Monge		RRR000415	1.1.3 (15)
Irons, Ellie L.	Commonwealth of Virginia, Dept. of Environmental Quality	RRR000679	1.7.14.1 (2794), 1.1.4 (16)
Irwin, Larry		RRR000478	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 2.1.2 (1418), 3.4.2 (42), 3.2.4.2 (7), 1.6.2 (51)
Israel, Carolyn Trupti		RRR000398	1.1.3 (15)
Ithurralde, James P.	Eureka County Board of Commissioners	RRR000664	1.2.3 (25), 2.4.2 (2765), 1.2.1 (113), 1.2 (9), 3.2 (11), 2.2.1 (43), 2.7.1 (128), 2.4.2 (3087), 3.7.1 (116), 2.7.7 (4164), 2.7.7 (4175), 3.7.7 (81), 2.7.5 (2372), 2.7.5 (2401), 3.7.5 (148), 3.15 (2451), 3.6.2 (130), 3.6.2 (87), 3.7.1 (3052), 3.7.4.2 (1125), 3.7.5 (1122), 3.7.8 (3089), 3.4.4 (36), 1.12 (4187), 3.12 (139), 1.6.2 (52), 1.7.14 (2461), 1.6.2 (164), 1.6.2.1 (61), 1.6.2 (2467), 1.3.1 (4169), 1.8.1 (33), 1.6.3 (73), 1.11 (2392), 2.4.2 (2654), 1.7.14 (2710), 1.9 (2714)
Izen, Ray L.		RRR000184	1.1.3 (15)
Jacobsen, Elaine		RRR000614	1.1.3 (15)
Jacobsen, Kathleen		RRR000250	1.1.3 (15)
James, Earl		RRR000927	1.1.3 (15), 1.3.2 (4167)
Janey, Linda C.	Maryland Dept. of Planning	RRR000129	2.2.3 (1269), 1.2.3 (25)
		RRR000306	1.2.3 (25)
Jaszczak, Cash		RRR000003	1.1.4 (16)
Jaszczak, Cash	Nye County Nuclear Waste Repository Project Office	RRR000044	1.2.4 (26)

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Jennings, Barbara	Midwest Coalition for Responsible Investment	RRR000543	1.1.3 (15)
Jetter, Judy		RRR000958	1.1.3 (15)
Jindra, Jo Ann E.		RRR000181	1.1.3 (15)
Johnson, Bruce		RRR000111	1.1.4 (16)
Johnson, Catherine		RRR000448	1.1.3 (15)
Johnson, Marcia		RRR000112	1.1.4 (16)
Johnson, Sharon		RRR000466	1.1.3 (15)
Johnson, Zach		RRR000825	1.1.3 (15)
Johnston, Jill		RRR000590	1.1.3 (15), 1.3.2 (4167)
Johnstone, Myna Lee		RRR000367	1.1.3 (15)
Jones, Barbara T.		RRR000564	1.1.3 (15), 1.3.2 (4167)
Jones, Cecil		RRR001036	1.1.3 (15)
Jones, Derek		RRR000436	1.1.3 (15)
Kaim, Ronald M.		RRR000190	1.1.3 (15)
Kaminski, Steven T.		RRR000359	1.1.4 (16)
Kamps, Kevin J.	Beyond Nuclear	RRR000237	1.6.2.1 (61)
		RRR000325	1.2 (9), 1.11 (4191), 1.6.3.2 (1556), 1.6.3 (1557), 1.7.15 (1593), 1.13 (28), 1.3.2 (4167), 1.1.3 (15), 1.9 (1561)
		RRR000357	1.6.2.1 (61)
		RRR000241	1.2 (9), 1.11 (4191), 1.6.3.2 (2600), 1.6.3 (74), 1.3.2 (4167), 1.1.3 (15), 1.7.8 (2604), 1.2.6 (27), 1.6.2 (52)
		RRR000260	1.4.6 (31)
Kaplan, Karen		RRR000382	1.1.3 (15)
Karas, Anna		RRR000743	1.1.3 (15), 1.3.2 (4167)
Karpen, Leah R		RRR000578	1.6.3.2 (176), 1.7.14 (1569), 1.6.2 (51), 1.1.3 (15)
Katz, Lorie		RRR000186	1.1.3 (15)
Kaufmann, Ellen		RRR000893	1.1.3 (15)
Kausch, George K.		RRR000477	1.1.3 (15)
Kean, Beth		RRR000637	1.1.3 (15)
Keele, Harold E		RRR000170	1.13 (28), 1.1.3 (15)
Keller, Nina		RRR000557	1.1.3 (15)
Kelly, Carla		RRR000563	1.1.3 (15)
Kelly, Mike		RRR000289	1.1.3 (15)
Kennedy, Joe	Timbisha Shoshone Tribe	RRR000690	1.7.18.2 (1520), 1.2 (12), 1.6.2 (1627), 1.1.3 (15), 1.7.18.2 (1625), 1.7.18.1 (1624), 1.2.6 (27), 1.3.2 (4167), 1.7.18.1 (1621), 1.6.3.2 (176), 1.7.10 (1618), 1.7.2 (1616), 1.7.4 (1614), 1.7.5 (157), 1.7.7 (1612), 1.7.8 (1610), 1.7.11 (1609), 1.7.12 (1608), 1.7.6 (1606), 1.7.6 (1605), 1.7.13 (171), 1.3.1 (4169), 1.12.1 (1601), 1.7.18 (1599), 1.7.18.2 (1591), 1.7.18 (1590), 1.7.18.2 (1589), 1.7.18 (1588), 1.7.6 (1587), 1.7.7 (1586), 1.7.18 (1585), 1.7.18.2 (1584), 3.7.14.2 (1583), 1.7.4 (4197), 1.7.15 (1581), 1.7.18.2 (1580), 1.12.2 (1578), 1.7.1 (1577), 1.7.5 (1576), 1.7.15 (1575), 1.7.8 (1574)

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Kennedy, Joe (continued)	Timbisha Shoshone Tribe	RRR000691	1.7.18.2 (1520), 1.2 (12), 1.6.2 (1627), 1.1.3 (15), 1.7.18.2 (1625), 1.7.18.1 (1624), 3.2.6 (94), 3.3.2 (4133), 3.12 (139), 3.7.1 (3106), 3.6.2 (106), 3.7.8 (3108), 3.6 (120), 3.6 (93), 3.7.1 (3113), 3.6.2 (3114), 3.7.14.2 (1583), 3.7.10 (3116), 2.7.2 (3117), 3.7.2 (3120), 3.7.2 (3121), 3.7.2 (3122), 3.7.2 (3123), 3.7.2 (3159), 2.7.4 (3160), 2.7.4 (3161), 3.7.4.1 (3162), 3.6.2 (88), 3.7.4.1 (3164), 1.7.5 (157), 2.7.5 (3166), 3.7.5 (3167), 3.7.5 (3168), 3.7.5 (3169), 2.7.7 (3349), 2.7.7 (3425), 2.7.8 (3426), 2.7.11 (3427), 2.7.11 (3428), 2.7.11 (3429), 2.7.12 (3430), 2.7.12 (3431), 2.7.12 (3432), 2.7.12 (3433), 2.7.6 (3434), 2.7.6 (3435), 2.7.13 (3436), 1.3.1 (4169), 3.7.6 (4146), 1.6.2.7 (3170), 3.4.3 (3171), 3.7.14.2 (3520), 3.7.3 (3521), 1.7.18.2 (1591), 1.7.18 (1590), 1.7.18.2 (1589), 1.7.18 (1588), 1.7.6 (1587), 1.7.7 (1586), 1.7.18 (1585), 1.7.18.2 (1584), 3.7.14.2 (1583), 1.7.4 (4197), 1.7.15 (1581), 1.7.18.2 (1580), 1.12.2 (1578), 1.7.1 (1577), 1.7.5 (1576), 1.7.15 (1575), 1.7.8 (1574)
Keyes, Janice M.		RRR000593	1.1.3 (15), 1.3.2 (4167)
Kibble, Carol		RRR000854	1.1.3 (15)
Kimball, Don		RRR000385	1.1.3 (15)
Kincaide, Delores		RRR000941	1.1.3 (15), 1.3.2 (4167)
King, Joan O.		RRR000627	1.1.3 (15)
King, Stephen E.		RRR000860	1.1.3 (15)
Kipen, Ken/Ethel		RRR000435	1.1.3 (15)
Kirby, William C.	Esmeralda County, Board of County Commissioners	RRR000068	1.1.4 (16), 3.4.6 (98), 3.4.6 (99)
		RRR000235	1.6.3.2 (3338), 3.7.1 (4225), 3.4 (24), 3.4.6 (98), 1.6.2 (3402), 3.4.6 (99)
		RRR000666	1.6.3.2 (176), 3.4 (24), 3.4.6 (98), 1.6.2 (3743), 3.4.6 (99), 3.4.1 (3382), 3.7.6 (3640), 3.7.1 (3679), 3.7.1 (3683), 3.7.7 (3684)
Kirk, Dave		RRR000099	1.1.3 (15)
Klevorick, Phillip		RRR000005	1.15 (4161)
Knittle, Christa		RRR000362	1.1.3 (15)
Kochaver, Marie		RRR000441	1.1.3 (15)
Kolar, Sanda		RRR000832	1.1.3 (15)
Kortes, Genny		RRR000419	1.1.3 (15)
Koschek, Kenneth	State of New Jersey, Dept. of Environmental Protection	RRR000567	1.6.3.2 (1457)
Kosmides, Kathryn L.		RRR000166	1.1.3 (15)
Kostmayer, Martha Ferris		RRR000542	1.1.3 (15)

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Kraft, Steven P.	Nuclear Energy Institute (NEI)	RRR000318	1.1.4 (16), 3.1.4 (69)
		RRR000619	3.1.4 (69), 3.4.3 (1), 3.7.8 (2313), 3.7.8 (2314), 3.15 (2315), 3.4.6 (98), 3.1.2 (2)
Kreis, Deborah		RRR000512	1.1.3 (15)
Kriesler, Leonard		RRR000285	1.2 (10), 3.4.3 (354)
Kuehnhackl, Krista M		RRR000867	1.11 (1445), 1.7.12 (1446), 1.7.12 (1447), 3.4.3 (1), 1.6.2 (1449), 1.7.11 (1450), 1.7.1 (1451), 1.7.11 (1452), 1.7.7 (1453), 1.7.15 (1454), 1.8.1 (33), 1.2 (1950)
LaForge, John		RRR000701	1.1.3 (15)
		RRR000840	1.1.3 (15)
LaPlaca, Nancy		RRR000839	1.1.3 (15)
LaVoie, Johny		RRR000255	3.2.7 (40)
Lacy, Darrell	Nye County, Nuclear Waste Repository Project Office	RRR000658	3.12 (139), 3.4.1 (34), 3.12 (4186)
Ladeira, Amber		RRR000601	1.1.3 (15)
Landguth, David M.		RRR000755	1.1.3 (15), 1.3.2 (4167)
Landguth, David		RRR000781	1.1.3 (15), 1.3.2 (4167)
Landon, Matt		RRR000587	1.1.3 (15)
Lanphear, Raymond A.		RRR000969	1.1.3 (15)
Larson, Keith	City of Caliente	RRR000016	3.12 (139), 3.12 (4186)
Lauchengco, Dennis		RRR000199	1.2 (101)
Law, Dennis/Theodora		RRR001058	1.1.3 (15)
LeFevre, Kathy		RRR000021	3.2.7 (40), 3.2.1 (47)
Lea, Robert J.		RRR000345	3.4.1 (23)
Lehman, Mary		RRR000606	1.1.3 (15), 1.6.2.1 (61)
Lewis, Judy		RRR001042	1.1.3 (15)
Lewis, Marvin I.		RRR000538	1.7.14.1 (2799), 1.7.16 (4233)
Lewis, Tonya D.		RRR000784	1.1.3 (15), 1.3.2 (4167), 1.2.1 (72)
Liesner, Joseph		RRR000742	1.1.3 (15)
Lightfoot, Jack		RRR000390	1.1.4 (16), 3.4.2 (542)
Lim, Kingman G.		RRR000373	1.1.3 (15), 1.6.3.2 (176), 1.6.2.7 (3646), 1.8.1 (33), 1.6.2 (3648), 3.7.8 (3649)
Lincoln, Robert		RRR000552	1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176)
Linda, Deb		RRR000577	1.1.3 (15), 1.6.2.1 (61), 1.2.1 (55), 1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Linda, Tom		RRR000732	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Linder, Josh	Environment America	RRR000328	1.1.3 (15), 1.9 (263), 1.2.6 (27), 1.6.2 (52)
Linesch, Catherine		RRR000047	1.1.3 (15)
Lintner, Michael F.		RRR000991	1.1.4 (16)
Liparulo, Nick	Westinghouse	RRR000727	1.1.4 (16)
Long, Patricia		RRR000033	3.4.1 (34)

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Lonsumpun		RRR001006	1.1.4 (16)
Loux, Robert R.	State of Nevada, Agency for Nuclear Projects	RRR000662	1.3.1 (944), 1.2.2 (50), 1.2 (4), 1.2 (111), 1.4.4 (29), 1.2.1 (55), 1.3.1 (956), 1.6.3 (73), 1.7.15 (917), 1.7.8 (918), 1.6.5 (58), 1.6.5 (57), 1.7.12 (922), 1.6.1 (67), 1.7.16 (4233), 1.2 (12), 1.6.2.5 (163), 1.6.2.5 (980), 1.7.14 (981), 1.6.2 (51), 1.6.2.7 (986), 1.6.2.5 (141), 1.6.2.5 (984), 1.6.2.7 (985), 1.6.2.7 (989), 1.6.2.7 (3181), 1.6.2.7 (990), 1.6.2.7 (991), 1.7.14.1 (992), 1.6.2.7 (993), 1.6.2.7 (994), 1.7.14 (4198), 1.6.2.5 (997), 1.2.6 (27)
		RRR000663	1.2.2 (50), 1.1 (841), 1.2 (4), 2.2 (32), 3.2.4.2 (7), 1.2 (60), 1.2 (9), 1.11 (930), 2.2.1 (43), 2.4.1 (41), 3.1 (933), 3.4.5 (937), 3.4.1 (18), 3.4.5 (939), 3.7.1 (940), 3.2.5 (941), 1.7.14 (949), 1.7.14 (4198), 3.7.14.1 (951), 1.7.16 (4233), 2.7.8 (953), 1.6.2 (164), 3.4.3 (919), 3.11 (1042), 3.4.4 (36), 1.6.2 (51), 1.7.14.2 (1046), 3.2.3 (1050), 3.2.4.1 (1052), 3.2.6 (94), 3.3.2 (1018), 3.7.10 (1093), 3.7.8 (1110), 3.7.4.2 (154), 2.1 (1132), 2.6 (1135), 2.7.1 (1148), 2.7.7 (4175), 3.6.2 (90), 3.7.1 (1153), 3.6 (93), 3.7.1 (116), 3.7.7 (66), 3.7.5 (1122), 3.7.4.2 (1125), 1.12 (4187), 3.7.1 (117), 3.6 (92), 3.7.10 (1176), 1.6.2 (1177), 3.2.3 (1178), 3.7.1 (1179), 3.7.4.2 (1181), 3.7.6 (1182), 3.7.6 (1183), 1.12.1 (4217)
Lupo, Vivian		RRR000774	1.3.2 (4167), 1.1.3 (15)
Mackenzie, Therese		RRR000812	1.1.3 (15)
Maclean, Gary		RRR000987	1.1.4 (16)
Macy, Francis U.	Center for Safe Energy	RRR000696	1.1.3 (15)
Macy, Joanna R.		RRR000753	1.3.2 (4167), 1.1.3 (15)
Maestas, Lisa Marie		RRR000785	1.1.3 (15), 1.3.2 (4167)
Magar, Mary Jo/Joe		RRR000635	1.1.3 (15)
Mahoney, Stephen		RRR000469	1.7.4 (89)
Malkin, Mort		RRR000558	1.1.3 (15)
Mallory, Kelli		RRR000791	1.1.3 (15), 1.3.2 (4167)
Malloy, Max		RRR000252	1.1.3 (15)
Malmedal, Kelley		RRR000154	1.1.3 (15)
Manion, Patricia Jean		RRR000697	1.1.3 (15), 1.3.2 (4167)
Maniscalco, Peter		RRR000940	1.1.3 (15), 1.3.2 (4167)
Manner, Jim		RRR001084	3.1.4 (69), 3.4.1 (4212)
Maple, Susan L.		RRR000340	1.1.3 (15)
Marchese, John		RRR000173	1.1.3 (15), 1.4.4 (29)
Marchese, Rich J.		RRR000174	1.1.3 (15), 1.4.4 (29)
Mareck, Katherine		RRR000571	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Margison, Bob		RRR000740	1.1.3 (15)
Mark, Jonathan		RRR000882	1.1.3 (15)
Markey, Darlene		RRR000623	1.7.18.1 (2229)
Marks, Luan Fautech		RRR000916	1.1.3 (15)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Makes			
Marsh, Amy Hadden		RRR000560	1.1.3 (15), 1.3.2 (4167), 1.7.3 (172), 1.6.3.2 (176), 1.3.3 (4168)
Martini, Geno R.	The City of Sparks	RRR000351	1.1.3 (15)
Martz, Douglas		RRR001024	1.12.2 (160)
Marvin, Anne		RRR000718	1.1.3 (15)
Matsuda, Thomas		RRR000399	1.1.3 (15), 1.3.2 (4167)
Matsuda, Thomas		RRR000762	1.1.3 (15), 1.3.2 (4167)
Matt, Jane R.		RRR000739	1.1.3 (15), 1.3.2 (4167)
Mayo, Paul		RRR000897	1.1.3 (15), 1.3.2 (4167)
Mazzotti, Amanda		RRR000736	1.1.3 (15), 1.3.2 (4167)
McCabe, Eileen		RRR000929	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.6.3 (74), 1.7.3 (172), 1.7.16 (3470), 1.3.2 (4167), 1.7.6 (3539), 1.7.4 (3756), 1.7.8 (3543), 1.2.6 (27), 1.1.3 (15)
McCabe, George		RRR001034	1.1.3 (15)
McCally, Michael	Physicians for Social Responsibility	RRR000861	1.1.3 (15), 1.3.3 (4168), 1.7.8 (1948), 1.7.15 (1924), 1.7.8 (1923)
McCarthy, Karen		RRR000156	1.1.3 (15)
McClellan, Scott		RRR000030	1.1.4 (16), 1.12.2 (160)
McClintock, Francene		RRR000831	1.1.3 (15)
McCullum, Rod	NEI Yucca Mountain Project	RRR000058	1.1.4 (16)
McCullum, Rodney	Nuclear Energy Institute (NEI)	RRR000279	1.1.4 (16)
		RRR000620	1.1.4 (16), 1.7.8 (1810), 1.8.1 (33), 1.6.1 (67), 1.2.1 (46), 1.7.16 (4234), 1.6.3.2 (1744), 1.2 (111), 1.6.2.2 (1714), 1.1 (1713), 1.15 (4161), 1.7.1 (1683), 1.7.15 (1682), 1.7.15 (1681)
McDannald, John A.		RRR000177	1.1.3 (15)
McGill, Mike		RRR000605	1.1.3 (15)
McGoldrick, Suzanne L.		RRR000231	1.6.3.2 (175), 2.4.1 (41), 3.7.7 (79), 3.7.8 (3584), 3.1.3 (53)
McInnis, May		RRR000201	3.3.2 (161)
		RRR000249	3.12 (139)
McMahon, Diane M.		RRR000957	1.1.3 (15)
McMullen, Penelope		RRR000877	1.1.3 (15), 1.3.2 (4167)
McPheeters, Greg T.		RRR000875	1.1.3 (15)
McWhite, Nancy		RRR000808	1.1.3 (15), 1.7.6 (4178)
Meadow, Norman D.		RRR000866	1.8.1 (33)
Mears, Michael A.	Eureka County Assessor's Office	RRR000669	2.7.1 (128)
Medina, Amanda G.		RRR000700	1.1.3 (15), 1.3.2 (4167)
Meikle, John F.		RRR000150	1.4.4 (29)
Mejia, Sergio		RRR000807	1.1.3 (15), 1.7.6 (4178)
Melvin, Jerry L.		RRR000962	1.4.6 (31)
Mengelkamp, Robert A.		RRR000164	1.1.3 (15)
Mersereau, K. K.		RRR000488	1.1.3 (15)
Meshkoff, Rose		RRR000088	1.1.3 (15)
Metz, Marc		RRR000799	1.1.3 (15), 1.7.14 (1569)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Meyer, Alfred	Alliance for Nuclear Accountability	RRR000330	1.6.3 (73), 1.6.3.2 (176), 1.7.8 (268), 1.4.4 (29)
		RRR000726	1.1.3 (15), 1.9 (75), 1.3.2 (4167), 3.4.4 (36), 1.3.3 (4168), 1.6.3.2 (176), 1.6.2.5 (142), 1.11 (4193)
Miller, Anne Norton	United States Environmental Protection Agency	RRR000667	1.3.3 (908), 1.9 (909), 1.2 (912)
		RRR000668	2.4.1 (915), 3.7.4.1 (824), 2.2 (825), 3.2 (4215)
Miller, Katya		RRR000699	1.1.3 (15), 1.3.2 (4167)
Miller, Marilyn		RRR000526	1.1.3 (15)
Miller, Mark		RRR000729	1.1.3 (15), 1.7.3 (172), 1.7.4 (89), 1.9 (75)
Miller, Sue		RRR001075	1.1.3 (15)
Miller, Suzanne M.		RRR000609	1.1.3 (15)
Miller, Virginia J.		RRR000833	1.1.3 (15), 1.3.2 (4167)
Millett, Jerry	Duckwater Shoshone Tribe	RRR000693	3.7.6 (4146), 2.7.13 (1485), 2.7.6 (1486), 2.7.6 (1488), 3.7.14.1 (1490), 3.7.14.1 (1492), 3.7.7 (48), 3.7.8 (4224), 3.7.6 (1497), 3.7.13 (168), 3.7.5 (1549), 3.7.6 (1551), 1.3.2 (4167)
Minard, Maryal		RRR000978	1.1.3 (15)
Minch, Allen		RRR000767	1.1.3 (15), 1.3.2 (4167)
Miner, Judy		RRR000507	1.1.3 (15)
Miranda, Daniel		RRR000397	1.7.6 (4178)
Mirisch, Judy		RRR000205	1.1.3 (15)
Mitchell, Delbert		RRR000189	1.1.4 (16), 1.12.2 (160)
Mitzelfelt, Brad	County of San Bernardino, Board of Supervisors	RRR000673	1.1.3 (15), 1.2 (4), 1.3.1 (2294), 1.7.14 (4198), 1.6.2.1 (61), 1.3.1 (4169)
Mizdrak, Marko		RRR000778	1.1.3 (15), 1.3.2 (4167)
Moffat, Jay		RRR000834	1.2 (9)
Moline, Alex		RRR000428	1.1.3 (15)
Molnar, Katrina		RRR000715	1.1.3 (15)
Monachelli, Carolyn		RRR000545	1.1.3 (15)
Monastero, Joan		RRR000716	1.1.3 (15)
Moncada, Patricia		RRR000888	1.7.6 (4178)
Moore, Ashley	City of Caliente	RRR000118	1.1.4 (16), 3.4.1 (23), 3.3.1 (169), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
Moore, Richard C.		RRR000943	3.7.1 (116), 3.7.5 (3946)
Moore, Roanne		RRR000119	1.1.4 (16), 3.4.1 (23), 3.3.1 (169), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
Moose, Virgil	Big Pine Paiute Tribe of the Owens Valley	RRR000675	1.7.18.2 (2725), 1.2 (9), 1.2 (13), 1.3.2 (4167), 1.7.3 (2804), 1.7.4 (2846), 1.7.4 (2850), 1.7.18.2 (2854), 1.7.18.1 (2855), 1.7.6 (4086), 1.7.6 (4179), 1.6.3.2 (175), 1.7.13 (171), 1.6.5 (58), 1.2 (111), 1.4.4 (29), 2.4.1 (41), 3.7.14.1 (4036), 2.7.7 (2319), 3.7.6 (2479), 3.7.14.2 (2489), 1.6.2.7 (2490), 3.7.14.2 (2492), 3.4.7 (2565), 1.1.3 (15), 1.6.3.2 (176)
Morano, Lana		RRR000465	1.6.2.1 (61), 1.1.3 (15)
Morgan, Charles W.		RRR000504	1.1.3 (15)
Morgan, Judy A.		RRR000971	1.1.3 (15)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Morrow, Theresa		RRR000224	1.1.3 (15)
Morton, Jenna		RRR000219	1.2.6 (27), 1.2 (12), 1.1.3 (15)
Morton, Jenna	Nine Group	RRR000259	1.2.6 (27), 1.2 (12), 1.1.3 (15)
Moss, Allen	Western Shoshone National Council	RRR000865	1.3.2 (4167)
Mueller, Joanne D.	Maryland Dept. of the Environment	RRR000027	1.2.3 (25)
Mullen, Mary		RRR000434	1.1.3 (15)
Mullings, Diamond		RRR000769	1.7.4 (4188), 1.7.4 (4189), 1.7.7 (4230), 1.7.18.1 (2272), 1.3.2 (4167), 1.6.3.2 (176), 1.7.12 (134), 1.11 (4193), 1.6.3 (74), 1.7.15 (2278), 1.2.1 (72), 3.2.4.2 (7), 1.6.2 (44), 1.7.14 (2282), 1.6.2.1 (61), 1.3.3 (4168), 1.2 (12), 1.2 (13)
Mulvenon, Norman	LOC Inc. – Oak Ridge Reservation Local Oversight Committee	RRR000702	1.1.4 (16)
Murray, Jacqueline		RRR000369	1.1.3 (15), 1.3.3 (4115)
Murtensen, Larry		RRR000391	1.1.3 (15)
Muson, Ray		RRR000200	1.1.3 (15)
Myers, Calvin		RRR000304	1.1.3 (15)
Myers, Stephanie		RRR000354	1.1.3 (15)
Myrick, Patrick T.		RRR000844	1.1.4 (16)
Nagle, Susan		RRR000858	1.1.3 (15)
Naha, Cynthia		RRR000485	1.7.6 (4178)
Naranjo, Marian		RRR000810	1.1.3 (15), 1.7.6 (4178)
Nash, Nora		RRR000931	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.2 (9), 1.6.3 (74), 1.7.4 (150)
Navis, Irene	Clark County Nuclear Waste Program	RRR000280	1.2.1 (72), 1.2.2 (50), 1.3.1 (344), 1.7.14 (4192), 1.6.2.5 (163), 1.6.5 (58), 1.4.5 (30), 1.3.3 (4168), 1.11 (4191), 1.6.5 (56), 1.13 (28)
Navis, Irene	Clark County, Nevada, Dept. of Comprehensive Planning	RRR000681	1.2.6 (27), 1.13 (28), 1.6.3 (70), 1.11 (3006), 1.11 (3007), 1.11 (3037), 1.7.3 (3038), 1.7.7 (3039), 1.7.15 (3040), 1.7.15 (3084), 1.7.16 (4233), 1.8.1 (33), 3.4.2 (42), 1.7.14 (4192), 1.6.3.2 (176), 1.6.2 (51), 3.12 (139), 3.11 (4177), 3.2.1 (47), 3.7.8 (2337), 1.7.16 (2367), 3.7.8 (2369), 1.7.14 (2371), 3.7.8 (2398), 3.7.8 (2399), 3.6.4 (2400), 3.4.3 (2402), 3.6 (124), 1.7.4 (2450), 1.11 (2452), 1.11 (2453), 1.6.3 (74), 1.7.2 (2456), 3.7.2 (2531), 3.7.9 (2532), 1.12 (2533), 1.2.1 (72), 1.2 (4), 1.7.8 (3041), 1.7.2 (3042), 1.7.8 (3043)
Nelis, Elizabeth A		RRR000966	1.1.3 (15)
Nelis, William D.		RRR000964	1.1.3 (15)
Nelson, Dennis P.		RRR000588	1.1.3 (15)
Nelson, Dennis R.		RRR000820	1.1.3 (15), 1.3.2 (4167), 1.9 (3451)
		RRR000896	1.1.3 (15)
Newcomb, Steven	Indigenous Law Institute	RRR000660	1.3.2 (4167)
Newman, Roberta E.		RRR000649	1.1.3 (15)

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Newman, Sarah F.		RRR000430	1.1.3 (15)
Newton, Sharon A.		RRR000982	1.1.3 (15)
Nicholl, Robert L.		RRR000171	1.1.3 (15)
Nichols, Jean	La Comunidad	RRR000685	1.1.3 (15), 1.3.2 (4167)
Nidess, Rael		RRR000502	1.1.3 (15), 1.4.5 (30)
No last name given, Aaron		RRR000455	1.1.3 (15)
No last name given, Barbara		RRR000967	1.1.3 (15)
No last name given, Bob		RRR000161	1.1.4 (16)
No last name given, Dave		RRR001074	1.1.4 (16)
No last name given, Emily		RRR000410	1.1.3 (15)
No last name given, Jacquey		RRR001030	1.1.3 (15)
No last name given, Joe		RRR001062	1.1.4 (16)
No last name given, Lindalou		RRR000423	1.1.3 (15)
No last name given, P.J.		RRR000999	1.1.3 (15)
Nole, Zeb		RRR000287	1.4.6 (31)
Novick, Leah		RRR000386	1.1.3 (15)
O'Brien, William J.		RRR000209	3.1.3 (53)
O'Connell, Brian	National Association of Regulatory Utility Commissioners (NARUC)	RRR000323	1.1.4 (16)
O'Connor, Michael		RRR000077	3.4 (24)
		RRR000106	1.1.4 (16)
O'Neill, Bobbie Hart		RRR000413	1.16 (170)
ODonnell, Deb		RRR000387	1.1.3 (15)
Oberman, Robert M		RRR000956	1.1.3 (15)
		RRR000963	1.1.3 (15)
Ogren, Lorrie		RRR000532	1.1.3 (15)
Oleskevich, Diana	Sisters of St. Joseph of Carondelet	RRR000938	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.3.2 (4167), 1.6.3 (74), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Omuhundro, Charlotte		RRR000175	1.1.3 (15), 3.2.1 (47), 1.7.14.2 (4098)
One Feather, Harold J.		RRR000937	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.6.3 (74), 1.3.2 (4167), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Ornstein, Herbert		RRR000010	3.1.3 (53)
Oropeza, Carlos		RRR000374	1.1.3 (15)
Orr, Lisa		RRR000616	1.1.3 (15), 1.4.5 (30)
Osborne, Dan		RRR001052	1.12.2 (160)
Overton, Patrick		RRR000779	1.1.3 (15), 1.3.2 (4167)
Paape, Joyce		RRR000915	1.1.3 (15)

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Palma, Juan	U.S. Department of the Interior, Bureau of Land Management	RRR001081	1.9 (77), 1.7.5 (3414)
		RRR001082	3.7.5 (3415), 3.7.7 (80), 3.7.4.1 (3419), 3.7.5 (148), 3.2.3 (3417), 3.12 (139)
Parillo, Jill	Physicians for Social Responsibility	RRR000329	1.6.1 (67), 1.9 (409), 1.7.8 (410), 1.7.15 (411), 1.7.8 (412)
Parise, Mary J.		RRR000247	1.1.3 (15)
Parks, Terry P.		RRR000159	1.1.3 (15)
Parsons, Roland M.		RRR000288	1.1.4 (16)
		RRR000346	1.1.4 (16)
Patrie, Lewis E.		RRR000597	1.1.3 (15)
Payer, Tax		RRR000188	1.1.3 (15), 1.8.1 (33)
Pellett, Simon		RRR000651	1.1.3 (15), 1.3.2 (4167)
Pepin, Carolan		RRR000229	1.1.3 (15)
Perry, Sybil M.		RRR000598	1.6.2.1 (61), 1.1.3 (15)
Pham, Khanh	Nevada Pharmacist Association	RRR000134	1.1.3 (15)
Phillips, Kevin	City of Caliente	RRR000012	1.1.4 (16), 1.4.6 (31), 3.4.3 (1), 3.4.1 (23), 3.3.1 (169), 3.4.1 (3395), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
		RRR000116	1.1.4 (16), 1.4.6 (31), 3.4.3 (1), 3.4.1 (23), 3.3.1 (169), 3.4.1 (3395), 3.4.1 (22), 3.4.1 (38), 3.12 (139)
		RRR000641	3.2.3 (890), 3.2.1 (47), 1.2.1 (55), 1.4.4 (29), 2.4.1 (41), 3.12 (139), 3.4.6 (911), 3.3.2 (161), 3.4.3 (914), 3.3.1 (826), 3.4.1 (1071), 3.7.8 (831), 3.3.1 (169), 3.15 (833), 3.7.9 (834), 3.7.9 (835), 3.7.9 (836), 3.6 (177)
Phillips, Kevin J.	For A Better Nevada	RRR000706	1.1.4 (16)
Pickett, Carol J.		RRR000153	1.1.3 (15)
Pikus, Barbara		RRR000481	1.1.3 (15)
Piszczekand, Rosemary		RRR001020	1.6.2.1 (61)
Plaski, Lisa		RRR000202	1.1.3 (15)
		RRR001028	1.1.3 (15)
Pope, Kay A.		RRR000922	1.6.2.1 (61)
Porter, Al D.		RRR000180	1.1.3 (15)
Porter, Johanna		RRR000440	1.1.3 (15)
Price, Norma J.		RRR000143	1.1.3 (15)
		RRR000246	1.1.3 (15)
Pringle, Bruce M.		RRR000484	1.3.2 (4167), 1.1.3 (15), 1.7.4 (89), 1.6.2 (715), 1.6.3.2 (176)
Purpel, Elaine		RRR000473	1.1.3 (15)
Quinn, Bob	U.S. Transport Council	RRR000040	1.1.4 (16), 2.1.4 (71)
Quiroz, Mike		RRR000535	1.3.2 (4167), 1.7.4 (89)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Racime, Denyse	State of California, Dept. of Fish and Game	RRR001078	1.7.5 (2331), 1.7.4 (2360)
Rake, Launce	Progressive Leadership Alliance of Nevada	RRR000262	1.4.4 (29)
		RRR000263	1.1.3 (15)
Rana, Avis		RRR000719	1.1.3 (15), 1.6.2.1 (61), 1.7.16 (4233)
Rannells, Ed	Esmeralda County	RRR000073	3.1.4 (69), 3.4 (24), 3.7.7 (2793)
		RRR000107	3.4 (24)
Ransom, Rita L.		RRR000261	1.1.3 (15)
Rasche, Roger		RRR000087	1.16 (170)
Ray, Dorothy		RRR000035	1.1.3 (15), 3.4.1 (34), 3.7.1 (3486), 3.7.8 (3487), 3.2.6 (94)
Reback, Mark		RRR000936	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.6.3 (74), 1.3.2 (4167), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Rebman, Marilyn		RRR000149	1.1.3 (15)
Reed, Debra	Las Vegas Indian Center	RRR000283	1.7.18 (630), 1.4.6 (31), 3.4.2 (42), 1.7.18.2 (633)
Reese, Gary		RRR000267	1.1.3 (15)
Reese, Joy		RRR000581	1.1.3 (15)
Reid, Harry	Congress of the United States	RRR000290	1.2.1 (113), 1.2 (14), 1.2.1 (55), 1.6.3.2 (176), 1.9 (426), 1.3.3 (427), 3.7.1 (428), 3.2.1 (47)
		RRR000678	1.2.1 (55), 1.6.3.2 (176), 1.6.3 (70), 1.6.3 (73), 3.15 (152), 3.2.1 (47), 3.7.3 (1348), 3.7.4.1 (1349), 3.7.7 (1386), 3.7.7 (1387), 1.7.14 (4198), 1.2 (60), 1.2 (14)
Reilly, Jennifer		RRR000759	1.1.3 (15)
Reimer, Nancy		RRR000713	1.1.3 (15), 1.3.2 (4167)
Rendon, Genaro L.	Southwest Worker's Union	RRR000749	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167)
Reuschel, Warren		RRR000851	1.11 (3825)
Reuther, Sandra		RRR001073	1.1.3 (15)
Reynolds, Bruce		RRR000208	1.1.3 (15)
Reynolds-Sparks, Darla		RRR000904	1.1.3 (15)
Rhodes, Rick C.		RRR001023	1.1.3 (15)
Rice, Megan		RRR000300	1.1.3 (15)
Richardson, John		RRR000775	1.1.3 (15), 1.3.2 (4167)
Richmond, Ray		RRR001083	1.1.3 (15), 1.3.2 (4167)
Rickman, Robin	Westinghouse Electric Company	RRR000221	1.1.4 (16)
Ridgway, Virginia		RRR000076	3.4 (24)
Rigby, Dan		RRR000041	1.1.4 (16)
Rigby, Samantha		RRR000881	1.7.3 (172)
Riley, Amber-Renee		RRR000800	1.1.3 (15), 1.3.2 (4167)
Rivers, Victoria		RRR000948	1.7.16 (4233)
Rizzo, Sandi		RRR000050	1.1.3 (15)
Robert, Rene		RRR000907	1.1.3 (15)
Roberts, James C.		RRR000510	1.1.3 (15)
Roberts, Tommy J.		RRR000372	1.1.3 (15)
Rogers, Philip		RRR001021	1.6.2.1 (61)

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Rohrbach, Kim		RRR000544	1.3.2 (4167), 1.1.3 (15)
Rojas, Jessica		RRR000443	1.1.3 (15)
Rolfe, Kenneth		RRR000471	1.1.3 (15), 1.3.2 (4167)
Rolfe, Megan		RRR000470	1.1.3 (15), 1.3.2 (4167)
		RRR000653	1.1.3 (15), 1.3.2 (4167)
Rolofson, Kay F.		RRR000172	1.1.3 (15)
Romero, Bernie		RRR000996	1.1.4 (16), 1.1.3 (15)
Rosenthal, Judi		RRR001055	1.1.3 (15)
Ross, Candace		RRR000277	1.1.3 (15)
Ross, Robert		RRR000427	1.1.3 (15), 1.3.3 (674)
Ross, Steve	City of Las Vegas, Councilman	RRR000268	1.1.3 (15), 1.3.1 (4169)
Rossi, Joe		RRR000036	3.4.1 (21)
Roth, Erik B.		RRR000930	1.2 (9), 1.11 (4191), 1.6.3.2 (176), 1.6.3 (74), 1.3.2 (4167), 1.7.4 (150), 1.7.8 (3680), 1.2.6 (27), 1.1.3 (15)
Roth, Nick	Nuclear Age Peace Foundation	RRR000331	1.1.3 (15), 1.4.4 (29)
Rothermel, Phil/Kathryn		RRR001068	1.1.3 (15)
Rothgal, John		RRR000095	1.7.8 (326)
Rouvier, Julia		RRR000570	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Rowe, Tommy	County of Lincoln	RRR000019	1.16 (170)
Royce, Lottie		RRR000339	1.1.3 (15)
Rudestam, Kirsten		RRR000444	1.1.3 (15)
Russo, Kathy		RRR000045	1.2 (10), 1.3.2 (4167), 1.1.4 (16)
Ryan, Sheila		RRR000412	1.1.3 (15)
Rytinova, Zdenka		RRR000806	1.1.3 (15), 1.7.6 (4178)
Saba, Marcel A.		RRR000796	1.1.3 (15), 1.3.2 (4167)
Sabbadini, Gail		RRR000910	1.1.3 (15)
Salamon, Jeffrey IK.		RRR000360	1.1.3 (15)
Sampson, Irene M.		RRR000124	1.1.3 (15), 1.7.16 (4233), 1.12.2 (608), 1.7.7 (616)
Sanabria, Julie		RRR000902	1.1.3 (15)
Sanborn, Hugh		RRR000476	1.1.3 (15)
Sandness, Robert C.		RRR000313	1.14 (4190), 1.1.4 (16), 1.8.1 (33), 2.1.4 (71), 1.4.6 (31), 1.1.3 (15), 1.6.2.5 (3815), 1.6.2.5 (141), 1.6.2.5 (143), 1.6.2.5 (144)
Sanford, Warren		RRR000575	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Sanson, Steve	Veterans in Politics	RRR000295	1.1.3 (15)
		RRR000356	1.1.3 (15)
Saul, Kathleen M.		RRR000899	1.1.3 (15)
Savage, Joan Cope		RRR000417	1.1.3 (15)
Scheid, Ann		RRR000920	1.1.3 (15)
Schieffer, Richard	Sierra Safe Energy	RRR000394	1.1.3 (15)
Schitaroff, Nina		RRR000294	1.1.3 (15)
Schlaf, Bill		RRR000955	1.1.3 (15)
Schmieding, Quentin A.		RRR000823	1.1.3 (15)

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Schmieding, Rhea E.		RRR000517	1.1.3 (15)
Schmitt, Sean D.		RRR000179	1.1.4 (16)
Schmitz, Gladys M		RRR000976	1.1.3 (15)
Schneider, Keri		RRR000203	1.1.3 (15)
Schneider, Seth		RRR000363	1.1.3 (15)
Schroder, Gerri	City of Henderson	RRR000269	1.1.3 (15), 1.6.3.2 (176), 1.3.1 (3828)
Schroeder, Theodore J.	Sinai, Schroeder, Mooney, Boetsch, Bradley & Pace	RRR000352	1.1.3 (15)
Schultz, Jeffrey		RRR000884	1.1.3 (15)
Scott, Joyce		RRR000316	1.1.3 (15)
Scurlock, Rodger		RRR000764	1.1.3 (15), 1.7.4 (89), 1.3.2 (4167), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 3.2.4.2 (7), 1.6.2 (51)
Sea, Geoffrey	Southern Ohio Neighbors Group	RRR000887	1.7.6 (4178), 1.1.3 (15)
Secor, Nathanael		RRR000401	1.1.3 (15)
Sedlock, Cheryl		RRR000426	1.1.3 (15)
Seely, Clover L.		RRR000913	1.1.3 (15), 1.1.3 (15), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.4.1 (49), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Seidler, Paul	Nuclear Energy Institute	RRR000007	1.1.4 (16), 3.1.4 (69)
		RRR000057	1.1.4 (16)
		RRR000278	1.1.4 (16), 3.4.1 (23)
Sewall, Christopher		RRR000822	1.1.3 (15), 1.3.2 (4167)
Shahrooz, William		RRR000286	1.7.3 (4199), 1.1.3 (15)
Sharpe, Trudy J.		RRR000228	1.1.3 (15)
Shaw, Gary		RRR000953	1.7.8 (3936)
Sheldon-Scurlock, Peggy		RRR000572	1.1.3 (15), 1.7.4 (4061), 1.2.1 (72), 1.7.4 (4062), 1.2 (12), 1.7.16 (4233)
Shields, Randall		RRR000883	1.1.3 (15)
Shillinglaw, Fawn		RRR000688	2.4.1 (41), 1.7.14 (4198), 1.6.5 (45), 1.6.1 (67), 1.6.3.3 (2953), 1.6.2 (5), 1.7.8 (2951), 1.8.1 (33), 1.6.3.2 (175), 1.6.3.2 (2948), 1.6.3.2 (2947), 1.7.16 (2946), 1.6.3 (73), 1.7.8 (2945), 1.6.3.3 (2944), 1.6.3.3 (2942), 1.6.3 (74), 1.6.3.3 (2903), 1.6.5 (2902), 1.6.2.5 (163), 1.6.2.1 (61), 3.4.3 (20), 1.6.2.6 (2897), 1.13 (28), 1.6.5 (58), 1.7.4 (2894), 1.7.8 (2893), 1.7.8 (2892), 1.7.16 (4233), 1.7.15 (2890), 1.7.15 (2888), 1.7.15 (2885), 1.7.2 (2884), 1.6.5 (2832), 1.7.16 (2828), 1.6.3.2 (2826), 1.4.4 (29), 1.1.3 (15), 1.11 (2766), 1.11 (4194), 1.9 (76), 1.7.17 (2760), 3.7.2 (2759), 3.7.11 (2758), 3.7.2 (2757), 3.7.2 (2754), 1.7.4 (2753), 1.3.2 (4184), 1.6.3.3 (2333), 1.7.4 (2747), 1.7.4 (2746), 1.3.2 (4167), 1.7.3 (2744), 1.7.9 (2685), 1.7.11 (2684), 1.6.3.2 (2680), 1.7.15 (2677)
		RRR000689	2.4.1 (41)
Shively, Daniel		RRR000513	1.1.3 (15)

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Shock, Howard		RRR001008	1.1.3 (15)
Shyduroff, Sasha		RRR000891	1.1.3 (15)
Siegel, Larry		RRR000631	1.1.3 (15), 1.13 (28), 1.3.2 (4167), 1.9 (75), 1.7.4 (89), 1.6.3.2 (176), 3.4.2 (42), 3.4.4 (36), 1.6.2.1 (61), 1.7.16 (4233), 1.6.2 (44), 2.1.2 (1418), 3.2.4.2 (7), 1.6.2 (51)
Sill, Marjorie		RRR000042	1.1.3 (15), 2.4.1 (41), 3.4.1 (34), 3.7.8 (210), 1.6.2.1 (61)
Silvaggio, Janie		RRR001003	1.1.3 (15)
Silver, Sid		RRR000338	1.1.3 (15)
Silverstein, Mark E.		RRR001007	1.12.2 (160)
Simon, Laura		RRR000894	1.1.3 (15)
Simon, Mike	White Pine Nuclear Waste Project Office	RRR000522	1.2.2 (50), 1.7.14.1 (3048), 1.2.6 (27), 1.2.3 (25), 1.4.1 (49), 1.2.5 (2159), 1.9 (97), 1.6.2 (51), 1.6.2 (2162), 1.7.7 (2341), 1.3.1 (4169), 1.11 (2374), 1.15 (4161), 1.12 (4187), 2.4.1 (41), 2.4.4 (37), 1.2.1 (72), 1.12.1 (4210)
Sims, Marcus		RRR000449	1.1.3 (15)
Singleton, Dave	Native American Heritage Commission	RRR000032	1.7.6 (590)
Sinno, Moe		RRR000335	1.1.3 (15)
Sitnick, Leni		RRR000880	1.1.3 (15)
Sklar, Scott	The Stella Group, Ltd.	RRR000848	1.1.3 (15)
Slack, Susan		RRR000142	1.1.3 (15), 1.7.8 (3602), 1.7.16 (4233), 1.6.3 (73), 1.3.3 (4168), 1.7.3 (3606), 1.7.4 (4189), 1.7.4 (3608), 1.7.8 (3609), 1.6.3.2 (175), 1.11 (4191)
Smith, Catherine P.		RRR000146	1.4.4 (29)
Smith, Doug		RRR000060	1.6.2.5 (383)
Smith, Jamee R.		RRR000761	1.1.3 (15), 1.3.2 (4167)
Smith, Ross W.		RRR000358	1.1.4 (16)
Snow, Rick		RRR000049	3.1.3 (53), 1.13 (28), 1.6.2.5 (144), 1.6.2.7 (1267), 1.1.3 (15)
Snyder, Philip A.		RRR000944	1.1.3 (15)
Sojourner, Mary E.		RRR000924	1.1.3 (15), 1.3.2 (4167)
Sollinger, Nancy		RRR000078	3.7.4.2 (2316), 3.12 (139)
Sollitt, Shannyn		RRR000566	1.1.3 (15), 1.3.2 (4167)
Solomon, Laurie		RRR000721	1.1.3 (15), 1.7.4 (89), 1.6.2 (44), 3.2.4.2 (7), 1.3.2 (4167), 1.6.2 (2868)
		RRR000934	1.1.3 (15), 1.7.4 (89), 1.6.2 (44), 3.2.4.2 (7), 1.6.2 (2868), 1.3.2 (4167)
Song, Robert	Pan-Am Legal Services	RRR000248	1.1.3 (15)
		RRR000302	1.1.3 (15)
Songer, Betty		RRR000917	1.1.3 (15)
Sorrells, Marla		RRR000909	1.1.3 (15)
Spake, Colin		RRR000853	1.1.3 (15)
St. Blaze, Scott		RRR000809	1.1.3 (15)
Stafford, Paula M.		RRR000771	1.1.3 (15), 1.3.2 (4167), 1.2.1 (72)
Staggs, Donna		RRR000725	1.1.3 (15), 1.3.2 (4167)
Stalsworth, Wayne		RRR000898	1.1.3 (15)

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Stambaugh, Melanie		RRR000341	1.1.3 (15)
Stanton, Dolly P.		RRR000157	1.1.3 (15)
Stanton, William E.		RRR000158	1.1.3 (15)
Starr, Steven		RRR000868	1.1.3 (15)
Steinberg, Michael		RRR000918	1.1.3 (15)
Steninger, Al	Western Range Service	RRR000020	3.12 (139)
Steup, John		RRR000591	1.1.3 (15), 1.3.2 (4167)
Stewart, Max		RRR000291	1.1.3 (15)
Stewart, Valerie		RRR001043	1.1.3 (15)
Stone, Lynne		RRR000442	1.1.3 (15)
Stover, George/Sharon M.		RRR001032	1.1.3 (15)
Strick, James		RRR000906	1.3.3 (3541), 1.2.1 (55)
Strickland, Rose		RRR000109	1.2 (12), 1.3.2 (4184)
Strickland, Rose	The Toiyabe Chapter of the Sierra Club	RRR000745	1.2.2 (50), 1.2.1 (55), 1.4.4 (29), 1.7.14 (1250), 2.4.1 (41), 3.4.3 (20), 1.7.14 (1253), 1.2.1 (113), 1.1.3 (15)
Sturonas, Mark		RRR000213	1.1.3 (15)
Sullivan, John CC		RRR000972	1.1.4 (16)
Sullivan, Timothy	State of California, Dept. of Justice	RRR000659	1.1.3 (15), 1.2.1 (156), 1.7.14 (4198), 1.7.14 (3056), 1.7.16 (2163), 1.7.14 (2164), 1.6.2 (44), 1.6.2 (62), 1.6.3.2 (176), 1.2 (12)
Sulock, Dot		RRR000508	1.1.3 (15)
Svien, Kaia		RRR000462	1.1.3 (15)
Swain, Lornita R.		RRR000911	1.1.3 (15), 1.3.2 (4167)
Sweeney, Jay		RRR000536	1.1.3 (15)
Sweet, Carol		RRR001076	1.1.4 (16)
Taber, Christina		RRR000788	1.1.3 (15), 1.3.2 (4167)
Taino, Mark		RRR000368	1.1.3 (15)
Tanner, John	Coalition 21	RRR000138	3.1.4 (69)
Taylor, F.D.		RRR000859	1.3.2 (4167), 1.1.3 (15)
Teale, Laulani		RRR000594	1.1.3 (15), 1.7.6 (4178)
Tedesco, Concetta		RRR000843	1.1.3 (15)
Teer, Bill R.		RRR000191	2.15 (3801), 2.15 (3802), 3.7.6 (3803)
Thieme, Marilyn		RRR000952	1.12.2 (160)
Thomas, Kristen		RRR000301	3.4.1 (21), 1.1.3 (15)
Thomason, Amy		RRR001038	1.1.3 (15)
		RRR001050	1.1.3 (15)
Thompson, Alysha M.		RRR000734	1.1.3 (15), 1.3.2 (4167)
Thompson, Charles		RRR000299	1.1.4 (16)
Thompson, David		RRR000735	1.3.2 (4167), 1.1.3 (15)
Throckmorton, Arthur		RRR000439	1.1.4 (16)
Tieri, Anna		RRR001054	1.7.3 (172), 1.3.1 (3239)
Timmerman, Dan		RRR000378	1.1.3 (15)
Timmerman, Don		RRR000879	1.3.2 (4167), 1.1.3 (15)
		RRR000903	1.3.2 (4167), 1.1.3 (15)
Tittman, Jack B.		RRR000965	1.1.3 (15)
Tomkins, Pat		RRR000579	1.1.3 (15), 1.6.3 (73)
Toste, Jeff		RRR000576	1.1.3 (15)
Tousseau, Laura J.		RRR000152	1.1.3 (15)
Travis, Joan Stalking Bear		RRR000531	1.1.3 (15)

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Treadway, Carolyn		RRR000445	1.1.3 (15), 1.6.5 (45), 1.3.3 (935), 1.3.2 (4167)
		RRR000583	1.3.2 (4167), 1.1.3 (15), 1.6.5 (45), 1.3.3 (3412)
Treadway, Roy C.		RRR000838	1.1.3 (15)
Treharne, Rolanda	Walker Lake Working Group	RRR000392	1.16 (170)
Treichel, Judy	Nevada Nuclear Waste Task Force, Inc.	RRR000622	1.2.1 (55), 1.6.5 (58), 1.9 (1824), 1.6.3.2 (1823), 1.6.2 (1822), 1.6.3 (73), 3.4.2 (42), 1.7.7 (1798), 1.2.6 (27), 1.7.8 (1796), 1.2 (9)
Tritt, Eleanor		RRR000133	1.1.3 (15)
Tronto, Marlise		RRR000407	1.7.6 (4178)
Tuler, Seth		RRR000837	1.2.6 (27), 1.6.3.2 (175), 1.6.1 (67), 1.6.3 (74), 1.7.8 (4097), 1.2 (9)
Turk, Lawrence		RRR000515	1.16 (170)
Turner, Rose E.		RRR000169	1.1.3 (15)
Turner, Scott		RRR000845	1.1.3 (15)
Tyler, Jake		RRR000422	1.1.3 (15)
Uchino, Crystal		RRR000756	1.1.3 (15), 1.3.2 (4167)
Uferet, Lora		RRR000947	1.1.3 (15)
Uhalde, Gracian	John Uhalde and Company	RRR000618	3.7.1 (116), 3.7.1 (1427), 3.6 (129), 3.12 (139), 3.6 (93), 3.6.2 (122), 3.6.3 (108), 3.4.3 (1375), 3.2.5 (167), 3.7.1 (117), 3.11 (4172), 3.7.1 (118), 3.6 (107), 3.6 (109), 3.6.3 (96), 3.6.2 (130), 3.6 (133), 3.6 (120), 3.6 (105), 3.6 (132), 3.7.4.2 (1443), 3.12 (4186)
Ullrich, Anita L.		RRR000310	1.1.3 (15)
Van Diepen, Rick		RRR000912	1.1.3 (15)
Van Druten, Sarah		RRR000777	1.1.3 (15), 1.3.2 (4167)
Van Pelt, Pamela K.		RRR000135	1.1.3 (15)
Vandenbosch, Robert/ Susanne		RRR000232	1.6.3 (74), 1.6.2.5 (142), 1.15 (4161), 1.9 (3479), 1.9 (3481), 1.9 (3482)
van der Kamp, Dixie		RRR000770	1.1.3 (15), 1.3.2 (4167)
von Ranson, Jonathan		RRR000923	1.6.3.2 (176), 3.4.2 (42)
Vargas, Alicia		RRR000849	1.1.3 (15)
Vasquez, David A.		RRR000780	1.1.3 (15), 1.3.2 (4167)
Vatalaro, Jean A.		RRR000178	1.1.3 (15)
Vaught, Ron		RRR000353	1.1.3 (15)
Vesperman, Gary		RRR000265	1.4.6 (31)
Vesperman, Gary	New Energy Corporation	RRR000293	1.4.6 (31)
Vest, Lee	Remnant Yuchi Nation	RRR000383	1.1.3 (15), 1.7.6 (4178)
Viata, John		RRR000303	1.1.4 (16)
Vick, T.A.		RRR001049	1.1.3 (15)
Viereck, Jennifer O.	HOME - Healing Ourselves and Mother Earth	RRR000061	1.2 (10), 1.7.4 (396), 1.1.3 (15), 1.3.2 (4167)
		RRR000092	1.1.3 (15), 1.7.4 (4050)

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Viereck, Jennifer O. (continued)	HOME - Healing Ourselves and Mother Earth	RRR000712	1.7.4 (4188), 1.7.4 (4189), 1.7.7 (2735), 1.7.7 (4231), 1.3.2 (4167), 1.6.3.2 (176), 1.7.12 (134), 1.11 (4193), 1.6.3 (74), 1.7.15 (2807), 1.2.1 (72), 3.4.4 (36), 1.6.2 (44), 1.7.14 (4198), 1.6.2.1 (61), 1.3.3 (2813), 1.2 (12), 1.2 (13)
Vocke, Sharon		RRR000863	1.1.3 (15)
Volk, Barbara		RRR001056	1.1.3 (15)
Volpe-Gunsell, Amie Elizabeth		RRR000703	1.6.2.1 (61)
Wadsworth, Gordon		RRR000113	1.1.4 (16), 3.4.1 (23), 3.4.1 (22), 3.12 (139)
Wadsworth, Michele		RRR000114	3.4.1 (23), 3.4.1 (38), 3.12 (4186), 3.12 (139)
Walen, Tommy		RRR000234	1.1.3 (15)
Walker, Daniel	Californians for Safe, Clean, Efficient Nuclear Power	RRR000176	1.1.4 (16), 2.1.4 (71), 3.4 (3589), 1.12.1 (4105), 3.4.3 (1), 1.7.7 (3590), 3.6 (120), 1.4.5 (30)
Walla, Diana		RRR000195	1.1.3 (15)
Ward, Dick/Korla		RRR000028	3.2 (575), 1.7.16 (4233), 3.4.1 (34), 1.1.3 (15), 1.4.6 (31)
Ward, Jeffrey R.	Metallic Goldfield, Inc.	RRR000002	3.4 (462)
Washburn, Gwen	Churchill County Commissioners	RRR000523	1.2.1 (72), 1.2 (60), 3.12 (139), 3.7.7 (81), 3.11 (4170), 1.7.14 (4192), 3.4.6 (99), 1.7.14.1 (2773), 1.6.2.2 (2772), 2.4.1 (1995), 2.4.2 (145), 2.6 (1946), 2.4.1 (151), 2.7.1 (1841), 2.7.1 (1839), 2.7.4 (2699), 2.7.4 (54), 2.7.4 (2697), 2.7.4 (2696), 2.7.4 (2695), 2.7.4 (2694), 2.7.6 (2693), 2.7.8 (2692), 2.7.7 (4175), 2.2.5 (2690), 2.7.7 (2689), 2.7.7 (4173), 2.7.7 (4164), 2.11 (1701), 2.7.4 (2623), 2.7.5 (2622), 3.2.1 (47), 3.3.2 (161), 3.7.1 (116), 3.7.11 (2617), 3.7.7 (63), 3.11 (2614), 3.7.7 (2613), 3.2.5 (2612), 3.11 (1528), 3.11 (1526), 3.11 (1525), 3.11 (1523), 3.11 (4171), 2.2 (1980), 2.7.1 (1724), 2.7.7 (4164), 2.11 (4182), 2.15 (147), 1.7.14 (1986), 3.15 (1985), 3.1.2 (2), 3.4.5 (1983), 3.6.4 (1982), 2.4.1 (151), 2.4.6 (1913), 3.4.3 (1912), 2.7.1 (1720), 2.7.1 (1910), 2.7.4 (1908), 2.15 (1879)
Wastewin, Wambdi A.		RRR000632	1.7.6 (4178)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Weber, Michael F.	United States Nuclear Regulatory Commission	RRR000524	1.2 (3718), 1.2.1 (3719), 1.15 (4161), 1.2.1 (3721), 1.11 (3694), 1.7.12 (4010), 1.7.13 (4012), 1.2.3 (4013), 3.11 (4177), 3.6 (124), 3.7 (4109), 3.7.1 (4111), 3.2.1 (3141), 3.2.1 (3142), 3.7.13 (3143), 3.7.6 (3186), 3.7.6 (3187), 3.7.6 (3188), 3.3.3 (3189), 1.7.7 (4140), 1.7.2 (4141), 1.7.6 (4142), 1.7.15 (4143), 1.9 (3125), 1.7.8 (3126), 1.9 (3127), 1.12.1 (3128), 1.7.7 (3129), 1.7.13 (171), 3.7.3 (4150), 3.7.14.1 (4151), 3.7.4.1 (4152), 3.7.4.2 (4153), 3.7.4.2 (4154), 3.7.3 (4160), 3.11 (4155), 3.7.3 (4156), 3.7.3 (4166), 3.7.4.1 (4159), 3.7.4.2 (4147), 3.7.4.1 (4148), 3.7.4.1 (4149)
Wehren, Rixanne	Sierra Club, Mendocino Group	RRR000816	1.1.3 (15)
Weiskopf, Daniel		RRR000828	1.1.3 (15)
Weisman, David	Alliance for Nuclear Responsibility	RRR000089	1.2 (12), 1.2.1 (156), 1.6.2.7 (431), 1.6.2.5 (144)
Weisman, David	Alliance for Nuclear Responsibility	RRR000120	1.2.1 (156), 1.6.2.7 (3014), 1.6.2 (3015)
Weiss, Jeffrey	Dia Art Foundation	RRR000652	3.4.1 (35)
Wells, John	Corporation of Newe Sogobia	RRR000836	1.3.2 (4167), 3.4.2 (42), 1.4.6 (31), 1.11 (1684), 1.7.6 (1685), 1.7.7 (4231), 1.3.1 (4169), 3.7.1 (1688), 1.7.16 (1689), 1.7.8 (1690), 1.7.8 (2321), 3.3.2 (161), 3.6 (120), 2.7.1 (2324), 1.6.3.2 (175), 3.2.4.2 (7), 3.3.2 (2327), 1.7.13 (171)
West, Cat		RRR000364	1.7.6 (4178), 1.1.3 (15)
Wetch, Joe	JOSSCH-LLC	RRR000011	1.4.6 (31)
		RRR000125	1.2 (101), 1.4.6 (31)
Wetzel, Robert		RRR000216	1.4.6 (31)
Wheeler, Mark		RRR000613	1.1.3 (15)
Wheeler, Wilma A.		RRR000147	1.1.3 (15)
		RRR000308	1.1.3 (15)
Whetstone, Joe		RRR000456	1.1.3 (15)
White, Andrew		RRR000783	1.1.3 (15), 1.3.2 (4167)
Wieck, Chris		RRR000855	1.1.3 (15)
Wiegel, Ryan		RRR000064	1.1.3 (15), 1.6.2.1 (61), 1.2 (12)
Williams, Eesha		RRR000885	1.1.3 (15)
Williams, Harry		RRR000084	1.1.3 (15)
		RRR000103	3.7.8 (2416), 1.6.1 (67)
Williams, Jack		RRR000085	1.1.3 (15)
Williams, Jim	Western Interstate Energy Board - WIEB	RRR000661	1.6.2.5 (165), 1.6.2.5 (2573), 1.6.2.5 (155), 1.3.1 (4169), 1.6.2 (2657), 1.6.3.2 (2658), 1.6.2 (2664), 1.1 (2665), 1.7.14.1 (2742), 1.4.1 (49), 1.7.14 (4192), 1.6.2 (2806), 1.7.14 (2859), 1.7.14 (2939), 1.6.2.2 (2985), 1.6.2 (164), 1.11 (3030), 1.6.2.5 (141), 1.7.14 (3032)
Williams, Kathy		RRR000939	1.1.3 (15), 1.3.2 (4167)

Commenter	Organization	Comment Document Number	Location of Comments/Responses
Williams, Richard		RRR001012	1.1.4 (16)
Wilson, Bill		RRR000204	1.1.3 (15)
Wilson, Joy		RRR000086	1.1.3 (15)
Wilson, Lois		RRR000090	1.1.3 (15)
Win, Zwe P.		RRR001001	1.1.3 (15)
Winsten, Michele		RRR001077	1.1.3 (15)
Wood, Brad		RRR000402	1.1.3 (15)
Wood, Lea		RRR000714	1.7.3 (172), 1.6.2.1 (61), 1.6.1 (67), 1.3.2 (4167)
		RRR000847	1.1.3 (15), 1.3.2 (4167)
Woods, Stanford C.		RRR000258	1.7.3 (4199)
Woodward, Holly		RRR000707	1.1.4 (16)
Woolley, Dorothy		RRR000162	1.1.3 (15)
Wright, Amber		RRR000227	1.1.4 (16)
Wright, David	Nuclear Waste Strategy Coalition (NWSC)	RRR000117	1.1.3 (15), 1.6.2.5 (163), 1.7.14 (4198), 2.1.4 (71), 2.4.1 (1708), 2.4.7 (1709), 3.4.1 (23), 3.4.3 (1), 1.4.4 (29), 3.1.4 (69), 1.1.4 (16)
Wynn, Isaac		RRR000600	1.1.3 (15)
Yazzie, Penelope P.		RRR001015	1.1.3 (15)
Young, Aaron		RRR000919	1.1.3 (15)
Young, Joyce		RRR000128	1.1.3 (15)
Young, Peter		RRR000384	1.1.3 (15)
Yourgules-Scholes, Bella		RRR001065	1.1.3 (15)
Zabarte, Ian	Western Shoshone National Council	RRR000121	1.7.18.2 (4078), 1.7.6 (4122), 1.7.18 (4125), 1.7.18.1 (4127), 1.3.2 (4167), 1.7.18.2 (3096), 1.7.13 (171), 1.7.18.1 (3101), 1.7.18.1 (3102), 1.3.1 (3145), 1.11 (3148), 1.7.6 (3149), 1.12 (3151), 1.2.6 (27), 1.7.5 (3191), 1.7.15 (3195), 1.6.2.7 (3979), 1.7.18.2 (3197), 1.7.8 (3200), 2.7.6 (3201), 1.7.4 (4197), 1.7.7 (4231), 1.7.1 (3981), 1.7.5 (157)
		RRR000276	1.7.18 (456), 1.3.1 (4165), 1.2.6 (27)
		RRR000327	1.7.18 (450), 1.3.1 (4165), 1.2.6 (27), 1.2 (9)
		RRR000347	1.7.18 (450), 1.3.1 (4165), 1.2.6 (27)
Zarchin, Paul		RRR000628	1.1.3 (15)
Ziegler, Maggie		RRR000447	1.1.3 (15)
Zitney, Lisa		RRR000217	1.1.4 (16), 2.4.2 (380)
Zolkover, Adrian		RRR000025	2.15 (146), 1.1.3 (15), 1.7.3 (172), 1.7.16 (619), 1.4.6 (31), 1.6.2.5 (144), 1.14 (4190), 1.7.16 (623)
Zuziak, Denise M.		RRR000773	1.1.3 (15), 1.3.2 (4167), 1.2.1 (72)
Zwicker, Marie Long		RRR000720	1.1.3 (15), 1.6.2.1 (61), 1.7.4 (4059), 1.3.2 (4167), 1.6.3.2 (176), 1.7.15 (3785), 1.7.16 (4233), 2.4.1 (41), 3.4.4 (36), 3.14 (3832), 3.2.4.2 (7), 1.6.2 (51)
Zwicker, Marie Louise Morandi Long		RRR000549	1.1.3 (15), 1.6.2.1 (61), 1.7.4 (4059), 1.3.2 (4167), 1.6.3.2 (176), 1.7.15 (3785), 1.7.16 (4233), 2.4.1 (41), 3.4.4 (36), 3.14 (3832), 3.2.4.2 (7), 1.6.2 (51)

Table CR-3. Cross reference from comments/responses to commenter(s) and original comments.

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1 (841)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0002
1.1 (961)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0015
1.1 (964)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0018
1.1 (1713)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0012
1.1 (2665)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0008
1.1 (3105)	Alley, Charles	RRR000995 / 0026
1.1 (4075)	Alley, Charles	RRR000995 / 0016
1.1.3 (15)	Aaron, Grace	RRR000973 / 0001
	Abeldt, Vern	RRR000344 / 0001
	Abraham, Natalie	RRR000790 / 0001
	Adair, Margo	RRR000945 / 0001
	Adams, Steven	RRR000905 / 0001
	Agan, Steven	RRR000950 / 0001
	Amonette, Amber	RRR000813 / 0001
	Anderson, Andrew	RRR000256 / 0001
	Anderson, Jezreela	RRR000835 / 0001
	Las Vegas Paiute Tribe Anderson, Kenny	RRR000273 / 0001
	Anonymous	RRR000131 / 0001 RRR000160 / 0001 RRR000207 / 0001 RRR000377 / 0001 RRR000418 / 0001 RRR000425 / 0001 RRR000586 / 0001 RRR000602 / 0001 RRR000629 / 0001 RRR000798 / 0001 RRR000856 / 0001 RRR000895 / 0001 RRR000959 / 0001 RRR000979 / 0001 RRR000980 / 0001 RRR001005 / 0001 RRR001016 / 0001 RRR001017 / 0001 RRR001041 / 0001 RRR001044 / 0001 RRR001045 / 0001 RRR001046 / 0001 RRR001051 / 0001 RRR001057 / 0001 RRR001059 / 0001 RRR001060 / 0001 RRR001064 / 0001 RRR001067 / 0001 RRR001069 / 0001

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.3 (15) (continued)	Anonymous	RRR001072 / 0001
		RRR001080 / 0001
	Arnason, Deb	RRR000376 / 0001
	Arnason, Deb/Arne	RRR000826 / 0001
	Arnold, Davide	RRR000460 / 0001
	Askren, Anne	RRR000615 / 0001
	Atencio, Sandra	RRR000187 / 0001
	Bailey, John	RRR000553 / 0001
	Bailey, John	RRR000638 / 0001
	Bakula, Marcelle	RRR000499 / 0001
	Baleria, David	RRR000009 / 0001
	Ballerano, Chrys	RRR000389 / 0001
	Ballou, Debi	RRR001071 / 0001
	Balum, Anne	RRR000989 / 0001
	Bancroft, Kathy	RRR000098 / 0001
	Banks, Elizabeth	RRR000765 / 0001
	Barber, Frank	RRR000873 / 0001
	Barnell, Todd	RRR000730 / 0001
	Barnes, Kathryn	RRR000562 / 0001
	Baronvine, Sonia	RRR000509 / 0001
	Baroudi, Mat	RRR001039 / 0001
	Bartholomew, Alice	RRR000529 / 0001
	Barton-Russell, Rachel	RRR000846 / 0001
	Baseler, Rhonda	RRR000639 / 0001
	Bashiti, Amy	RRR000647 / 0001
	Bass, Patrice	RRR000206 / 0001
	Bassik, Renee	RRR001035 / 0001
	Batterden, James	RRR000804 / 0001
	Bauer, Benjamin	RRR000782 / 0001
	Baydoun, Gibran	RRR000210 / 0001
	Beazlie, Janet	RRR000610 / 0001
	Bechtel, Dennis	RRR000305 / 0001
	Beckwith, Nan	RRR000589 / 0001
		RRR000772 / 0001
	Bedoe, Bev	RRR000960 / 0001
	Belcastro, Frank	RRR000458 / 0001
	Benham, Joan	RRR000480 / 0001
	Benningson, Barbara	RRR000489 / 0001
	Benti, Wynne	RRR000071 / 0001
	Berg, Joel	RRR000123 / 0001
	Berhan, Mary	RRR000625 / 0001
	Berk, Larry	RRR000193 / 0001
	Bernard, Larry	RRR000551 / 0001
		RRR000728 / 0001
	Berrigan, Gail	RRR000763 / 0001
	Berry, Michael	RRR000805 / 0001
	Bertell, Rosalie	RRR000381 / 0001
	Bess, Jana	RRR000136 / 0001
	Bidwell, Joshua	RRR000889 / 0001
	Western Shoshone Defense Project	RRR000686 / 0001
	Bill, Larson	
	Billmeier, G.	RRR000464 / 0001
	Nuclear Information and Resource Services	RRR000324 / 0001
	Binette, Aja	

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.3 (15) (continued)	Women's International League for Peace and Freedom	RRR000862 / 0001
	Birnie, Patricia	
	Black, Leroy	RRR000214 / 0001
	Blackburn, Lee	RRR000850 / 0001
	Blanton, Patricia	RRR000185 / 0001
	Bliss, Ryan	RRR000371 / 0001
	Block, Dixie	RRR000768 / 0001
	Bloom, Cheryl	RRR000829 / 0001
	Bloom, Paul	RRR000062 / 0001
	NV Group Sierra Club	RRR000144 / 0001
	Blumensaadt, Eric	
	Bodde, Mary	RRR000497 / 0001
	Boeve, May	RRR000380 / 0001
	Boisvert, Barbara	RRR000986 / 0001
	Boisvert, John	RRR000988 / 0001
	Bonafine, Julia	RRR000946 / 0001
	Bonds, Julia	RRR000403 / 0003
	Monache Alliance	RRR000096 / 0001
	Bongochi, Monty	
	Border, Myram	RRR000819 / 0001
	Boutis, Kathleen	RRR000857 / 0001
	Bowen, Dora	RRR000993 / 0001
	Bowman, Brent	RRR000528 / 0001
	Boyce, James	RRR000793 / 0001
	Clark County	RRR000270 / 0001
	Brager, Susan	
	Bravo, Eliseo	RRR000797 / 0001
	Brooks, Eric	RRR000411 / 0001
	Broth, Mitchell	RRR001010 / 0001
	Brown, Diana	RRR000518 / 0001
	Brown, Merleen	RRR000519 / 0001
	Brown, Richard	RRR000024 / 0001
	Rainforest Action Network	RRR000705 / 0001
	Brune, Mike	
	Brunner, Demise	RRR001047 / 0001
	Buonaiuto, Shelley	RRR000684 / 0001
	Burkland, Monica	RRR001014 / 0001
	California Valley Miwok Tribe	RRR000751 / 0001
	Burley, Silvia	
	Burris, Laurence	RRR000511 / 0001
	Burton, Brandon	RRR000198 / 0001
	Bush, Pat	RRR000787 / 0001
	Bute, Holly	RRR000336 / 0001
	Calabro, Richard	RRR000818 / 0001
	Campbell, Hugh	RRR000211 / 0001
	Carey, Corinne	RRR000361 / 0001
	Carlson, Gertrude	RRR001066 / 0001
	Carnine, Berkley	RRR000747 / 0001
	Carroll, Richard	RRR000405 / 0001
	Carter, C.	RRR000457 / 0001
	Cashel, Kathleen	RRR000556 / 0001
	City of Reno	RRR000314 / 0001
	Cashell, Robert	
		RRR000680 / 0003

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.3 (15) (continued)	Cast, Dom	RRR000126 / 0001
	Castleberry, George	RRR000731 / 0001
	Castro, Alchesay	RRR000546 / 0001
	Cesena, Frank	RRR000018 / 0002
	Chandler, Stuart	RRR000758 / 0001
	Chang, Claire	RRR000874 / 0002
	Chelette, Iona	RRR000550 / 0003
	Chiucarello, Ed	RRR000461 / 0001
	Chozahinoff, Barbara	RRR001009 / 0001
	Christian, Amy	RRR000698 / 0001
	Christiansen, Holly	RRR000717 / 0001
	Christine, Alexi	RRR000794 / 0001
	Clark, Robert	RRR000309 / 0001
	Southern California Ecumenical Council	RRR000483 / 0001
	Cohen, Albert	
	Cohen, Isabel/Carl	RRR000474 / 0001
	Collins, Nicola	RRR000984 / 0001
	Comnes, Barbara	RRR000640 / 0001
	Conroy, Barbara	RRR000711 / 0001
	Cooley, Marian	RRR000487 / 0001
	Cooper-Vasquez, Lori	RRR001002 / 0001
	Corbett, Patrick	RRR000644 / 0001
	Corcoran, David	RRR000493 / 0001
	Corson, Jamie	RRR000379 / 0001
	Corwin, Stanley	RRR000752 / 0001
	Covington, Cathy	RRR000492 / 0001
	Cowan, James	RRR000148 / 0001
	Cox, Mike	RRR000921 / 0001
	Cravens, Marisa	RRR000650 / 0001
	Crawford, B.	RRR000311 / 0001
	Credille, Ellen	RRR000582 / 0001
	Cullen, Noreen	RRR000475 / 0001
	Curran, John	RRR000801 / 0001
	Curtis, David	RRR000416 / 0001
	Cuzze, Ron	RRR001085 / 0001
	D'Aquanni, Beverly	RRR000514 / 0001
	Moapa Band of Paiutes	RRR000272 / 0001
	Daboda, Darren	
	Daggett, Becky	RRR000733 / 0001
	Damaschke, Jon	RRR000803 / 0001
	Daum, Chris	RRR000604 / 0001
	Davies, William	RRR000792 / 0001
	Davis, Grace	RRR000312 / 0001
	Davis, Thomas	RRR000738 / 0001
	Council for a Livable World	RRR000643 / 0001
	Day, Alice	
	Day, Elena	RRR000486 / 0001
	DeMare, Joseph	RRR000595 / 0001
	DePauw, Jolie	RRR000852 / 0001
	DeVries, Laura	RRR000554 / 0001
	DeWitt, Ellen	RRR000901 / 0001
	Delucchi, Joy	RRR000421 / 0001
	Detweiler, Donna	RRR000539 / 0001
	Devine, Don	RRR000459 / 0001

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.3 (15) (continued)	DiSalvo, Nicole	RRR000704 / 0001
	Dias, Michael	RRR000342 / 0001
	Dickman, Elizabeth	RRR000548 / 0001
	Dillion, Teri	RRR000561 / 0001
	Dillon, Mary	RRR000215 / 0001
	Dilorenzo, M.	RRR000182 / 0001
	Northeast Pa. Audubon Society	RRR000876 / 0001
	Dodge, Katharine	
	Regional Association of Concerned Environmentalists (RACE)	RRR000935 / 0007
	Donham, Mark	
	Donn, Marjory/Bertram	RRR000516 / 0001
	Donovan, Mary	RRR000817 / 0001
	Douglass, Robert	RRR000501 / 0001
	Downey, J.	RRR000197 / 0001
	Drey, Kay	RRR000708 / 0001
	DuBois, Gwen	RRR000890 / 0001
	Duffy, Diana	RRR000830 / 0001
	Dukelow-Burton, Darlene	RRR000431 / 0001
	Dumont, Nellie	RRR000482 / 0001
	Duncil, Bruce	RRR000503 / 0001
	Durante, Charles	RRR000429 / 0001
	Dye, Patsy	RRR000990 / 0001
	Dyken, Carl	RRR000063 / 0001
	Dyken, Mark	RRR000350 / 0001
	Dziegiel, Henry	RRR000226 / 0001
		RRR000284 / 0001
	Earl, Gretchen	RRR000343 / 0001
	Eastling, Matt	RRR000611 / 0001
	Edwards, Carolyn	RRR000251 / 0001
	Ellen, Linda/Ron	RRR001037 / 0001
	Erb, Cheryl	RRR000634 / 0001
	Ertelt, Sabrina	RRR000914 / 0001
	Esparza, Mary	RRR000297 / 0001
	Estey, Kara	RRR000750 / 0001
	Etheridge, Kelly	RRR000408 / 0001
	Evans, Dinda	RRR000496 / 0001
	Fairchild, Stephanie	RRR000892 / 0001
	Twin Springs Ranch	RRR000075 / 0001
	Fallini, Joe	
	Farias, Corinne	RRR000424 / 0001
	Farm, D.W.	RRR001004 / 0001
	Fazzalaro, Mary	RRR000243 / 0001
	Feder, Malina	RRR000366 / 0001
	Felich, Tara	RRR000748 / 0001
	Fellows, Kevin	RRR000332 / 0002
	Filmore, Laura	RRR000048 / 0001
	Fine, Bill	RRR000053 / 0001
	Fitzell, Anne	RRR000592 / 0001
	J&K Expo	RRR000130 / 0001
	Fleming, Jay	
	Flores, Gabriel/Raven	RRR000811 / 0001
	Fofrich, Robert	RRR000802 / 0001
	Follins, Bryan	RRR000584 / 0001
	Foreman, Mary Jo	RRR000167 / 0001

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.3 (15) (continued)	Fox, Vicki	RRR000495 / 0001
	Fox, William/Myrna	RRR000926 / 0002
	Francia, Carol	RRR000541 / 0001
	Freedlund, Mary	RRR000630 / 0001
	Freeman, Jacqueline	RRR000530 / 0001
	Freeman, Lu	RRR000026 / 0001
	Fretheim, Paul	RRR000093 / 0001
	Friedman, Judi	RRR000463 / 0001
	Frost, Debra	RRR000001 / 0001
	Fujiyoshi, Ronald	RRR000724 / 0001
	Fuller, Ernest	RRR000870 / 0001
	Futrell, Susan	RRR000585 / 0001
	Gallagher, Sarah	RRR000654 / 0001
	Ganson, Mike	RRR000242 / 0001
	Garcia, Jeffery	RRR000821 / 0001
	Western Shoshone	RRR000052 / 0001
	Gardipe, Janice	
	Gardner, Jean	RRR000432 / 0001
	Garison, Ann	RRR000414 / 0001
	Garrett, Jo Anne	RRR000694 / 0001
	Garriott, Helen	RRR000333 / 0001
	Garrison, Ann	RRR000409 / 0001
	Garry, Rebecca	RRR000355 / 0001
	Garvey, Lydia	RRR000527 / 0001
	Geno, Debbie	RRR000500 / 0001
	Gentry, Don	RRR000559 / 0001
	Gere, Kathy	RRR000624 / 0002
	Gerstung, April	RRR000648 / 0001
	Nuremberg Actions	RRR000022 / 0001
	Getty, G.	
	Gibson, Joyce	RRR000437 / 0001
	Gilmore, Roseann	RRR001061 / 0001
	Gitersonke, Don	RRR000194 / 0001
	Givens, Nancy	RRR000479 / 0009
	Glenn, Rob	RRR000370 / 0001
	Globerle, W.	RRR000393 / 0001
	Godinez, Jacob	RRR000789 / 0001
	Goodison, Jason	RRR000776 / 0001
	Mid-Island Radiation Alert	RRR000608 / 0001
	Goodman, Miriam	
	City of Las Vegas	RRR000266 / 0001
	Goodman, Oscar	
	Grant, Abbie	RRR000954 / 0001
	Grant, Patrick	RRR000741 / 0001
	Greaser, John	RRR000827 / 0001
	Green, Karen	RRR000565 / 0001
	Green, Morgan	RRR000722 / 0001
	Greenhaw, Rhonda	RRR000520 / 0001
	Grenell, Jason	RRR000961 / 0001
	Griffith, Linda	RRR000365 / 0002
	Groom, Warren	RRR000151 / 0001
	Grote, Jennifer	RRR000165 / 0001
	Guzman, Tony	RRR000932 / 0006
	Haas, Shannon	RRR000766 / 0001

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.3 (15) (continued)	Haggerty, Bernard	RRR000872 / 0002
	Hale, Ann	RRR000494 / 0001
	Hall, James	RRR000744 / 0001
	Hall, Tressie	RRR000886 / 0001
	State of Nevada, Agency for Nuclear Projects	RRR000056 / 0002
	Halstead, Robert	
		RRR000274 / 0001
	Halt, Joanne	RRR000723 / 0001
	Hamburg, Robert	RRR000537 / 0001
	Hamilton, Mary	RRR000760 / 0001
	Hampson, Judith	RRR000168 / 0001
	Hansen, John	RRR000023 / 0001
	Hanson, Art	RRR000612 / 0001
	Harden, Cory/Martha	RRR000404 / 0001
	Harkins, Joanne	RRR000490 / 0001
	Hartle, Sherie	RRR000534 / 0001
	Harvey, Pauline	RRR000942 / 0001
	Harvey, Vivian	RRR000218 / 0001
	Haslam, Malissa	RRR000695 / 0001
	Haslett, Dora	RRR000505 / 0001
	Hatt, Greg	RRR000795 / 0001
	Haustermanns, Josine	RRR000596 / 0001
	SENAA West	RRR000746 / 0001
	Hayes, Sara	
	Headington, Maureen	RRR000974 / 0001
		RRR000975 / 0001
		RRR000977 / 0001
	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk	RRR000933 / 0009
	Heinonen, Valerie	
	Hellman, Codie	RRR000139 / 0001
	Hendrick, Paula	RRR000626 / 0001
	Herbst, Jeff	RRR000498 / 0001
	Hernesman, Barbara	RRR000908 / 0001
	Higginson, Judy	RRR000928 / 0001
	Hilfer, Eric	RRR000645 / 0002
	Holzberg, Steve	RRR000491 / 0001
	Houck, Sherry	RRR000754 / 0001
	Huber, Melissa	RRR000824 / 0001
	Huet-Vaughn, Yolanda	RRR000599 / 0001
		RRR000878 / 0001
	Huffman, Garrett	RRR000786 / 0001
	Illegible	RRR000573 / 0001
	Illo, Dana	RRR000446 / 0001
	Irizarry, Mesha Monge	RRR000415 / 0001
	Irwin, Larry	RRR000478 / 0001
	Israel, Carolyn	RRR000398 / 0001
	Izen, Ray	RRR000184 / 0001
	Jacobsen, Elaine	RRR000614 / 0001
	Jacobsen, Kathleen	RRR000250 / 0001
	James, Earl	RRR000927 / 0001
	Midwest Coalition for Responsible Investment	RRR000543 / 0001
	Jennings, Barbara	
	Jetter, Judy	RRR000958 / 0001

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1.1.3 (15) (continued)	Jindra, Jo Ann	RRR000181 / 0001
	Johnson, Catherine	RRR000448 / 0001
	Johnson, Sharon	RRR000466 / 0001
	Johnson, Zach	RRR000825 / 0001
	Johnston, Jill	RRR000590 / 0001
	Johnstone, Myna Lee	RRR000367 / 0001
	Jones, Barbara	RRR000564 / 0001
	Jones, Cecil	RRR001036 / 0001
	Jones, Derek	RRR000436 / 0001
	Kaim, Ronald	RRR000190 / 0001
	Beyond Nuclear	RRR000241 / 0006
	Kamps, Kevin	
	Beyond Nuclear	RRR000325 / 0008
	Kamps, Kevin	
	Kaplan, Karen	RRR000382 / 0001
	Karas, Anna	RRR000743 / 0001
	Karpen, Leah	RRR000578 / 0004
	Katz, Lorie	RRR000186 / 0001
	Kaufmann, Ellen	RRR000893 / 0001
	Kausch, George	RRR000477 / 0001
	Kean, Beth	RRR000637 / 0001
	Keele, Harold	RRR000170 / 0002
	Keller, Nina	RRR000557 / 0001
	Kelly, Carla	RRR000563 / 0001
	Kelly, Mike	RRR000289 / 0001
	Timbisha Shoshone	RRR000690 / 0004
	Kennedy, Joe	
		RRR000691 / 0004
	Keyes, Janice	RRR000593 / 0001
	Kibble, Carol	RRR000854 / 0001
	Kimball, Don	RRR000385 / 0001
	Kincaide, Delores	RRR000941 / 0001
	King, Joan	RRR000627 / 0001
	King, Stephen	RRR000860 / 0001
	Kipen, Ken/Ethel	RRR000435 / 0001
	Kirk, Dave	RRR000099 / 0001
	Knittle, Christa	RRR000362 / 0001
	Kochaver, Marie	RRR000441 / 0001
	Kolar, Sanda	RRR000832 / 0001
	Kortes, Genny	RRR000419 / 0001
	Kosmides, Kathryn	RRR000166 / 0001
	Kostmayer, Martha	RRR000542 / 0001
	Kreis, Deborah	RRR000512 / 0001
	LaForge, John	RRR000701 / 0001
	LaPlaca, Nancy	RRR000839 / 0001
	Ladeira, Amber	RRR000601 / 0001
	Landguth, David	RRR000755 / 0001
	Landguth, David	RRR000781 / 0001
	Landon, Matt	RRR000587 / 0001
	Lanphear, Raymond	RRR000969 / 0001
	Law, Dennis/Theodora	RRR001058 / 0001
	Lehman, Mary	RRR000606 / 0001
	Lewis, Judy	RRR001042 / 0001
	Lewis, Tonya	RRR000784 / 0001

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1.1.3 (15) (continued)	Liesner, Joseph	RRR000742 / 0001
	Lim, Kingman	RRR000373 / 0001
	Lincoln, Robert	RRR000552 / 0001
	Linda, Deb	RRR000577 / 0001
	Linda, Tom	RRR000732 / 0001
	Environment America	RRR000328 / 0001
	Linder, Josh	
	Linesch, Catherine	RRR000047 / 0001
	Lupo, Vivian	RRR000774 / 0002
	Mackenzie, Therese	RRR000812 / 0001
	Center for Safe Energy	RRR000696 / 0001
	Macy, Francis	
	Macy, Joanna	RRR000753 / 0002
	Maestas, Lisa	RRR000785 / 0001
	Magar, Mary Jo/Joe	RRR000635 / 0001
	Malkin, Mort	RRR000558 / 0001
	Mallory, Kelli	RRR000791 / 0001
	Malloy, Max	RRR000252 / 0001
	Malmedal, Kelley	RRR000154 / 0001
	Manion, Patricia	RRR000697 / 0001
	Maniscalco, Peter	RRR000940 / 0001
	Maple, Susan	RRR000340 / 0001
	Marchese, John	RRR000173 / 0001
	Marchese, Rich	RRR000174 / 0001
	Mareck, Katherine	RRR000571 / 0001
	Margison, Bob	RRR000740 / 0001
	Mark, Jonathan	RRR000882 / 0001
	Marks, Luan	RRR000916 / 0001
	Marsh, Amy	RRR000560 / 0001
	The City of Sparks	RRR000351 / 0001
	Martini, Geno	
	Marvin, Anne	RRR000718 / 0001
	Matsuda, Thomas	RRR000399 / 0001
	Matsuda, Thomas	RRR000762 / 0001
	Matt, Jane	RRR000739 / 0001
	Mayo, Paul	RRR000897 / 0001
	Mazzotti, Amanda	RRR000736 / 0001
	McCabe, Eileen	RRR000929 / 0012
	McCabe, George	RRR001034 / 0001
	Physicians for Social Responsibility	RRR000861 / 0001
	McCally, Michael	
	McCarthy, Karen	RRR000156 / 0001
	McClintock, Francene	RRR000831 / 0001
	McDannald, John	RRR000177 / 0001
	McGill, Mike	RRR000605 / 0001
	McMahon, Diane	RRR000957 / 0001
	McMullen, Penelope	RRR000877 / 0001
	McPheeters, Greg	RRR000875 / 0001
	McWhite, Nancy	RRR000808 / 0001
	Medina, Amanda	RRR000700 / 0001
	Mejia, Sergio	RRR000807 / 0001
	Mengelkamp, Robert	RRR000164 / 0001
	Mersereau, K.	RRR000488 / 0001
	Meshkoff, Rose	RRR000088 / 0001

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1.1.3 (15) (continued)	Metz, Marc	RRR000799 / 0001
	Alliance for Nuclear Accountability	RRR000726 / 0001
	Meyer, Alfred	
	Miller, Katya	RRR000699 / 0001
	Miller, Marilyn	RRR000526 / 0001
	Miller, Mark	RRR000729 / 0001
	Miller, Sue	RRR001075 / 0001
	Miller, Suzanne	RRR000609 / 0001
	Miller, Virgina	RRR000833 / 0001
	Minard, Maryal	RRR000978 / 0001
	Minch, Allen	RRR000767 / 0001
	Miner, Judy	RRR000507 / 0001
	Mirisch, Judy	RRR000205 / 0001
	County of San Bernardino, Board of Supervisors	RRR000673 / 0001
	Mitzelfelt, Brad	
	Mizdrak, Marko	RRR000778 / 0001
	Moline, Alex	RRR000428 / 0001
	Molnar, Katrina	RRR000715 / 0001
	Monachelli, Carolyn	RRR000545 / 0001
	Monastero, Joan	RRR000716 / 0001
	Big Pine Paiute Tribe of the Owens Valley	RRR000675 / 0026
	Moose, Virgil	
	Morano, Lana	RRR000465 / 0002
	Morgan, Charles	RRR000504 / 0001
	Morgan, Judy	RRR000971 / 0001
	Morrow, Theresa	RRR000224 / 0001
	Morton, Jenna	RRR000219 / 0003
	Mullen, Mary	RRR000434 / 0001
	Murray, Jacqueline	RRR000369 / 0001
	Murtensen, Larry	RRR000391 / 0001
	Muson, Ray	RRR000200 / 0001
	Myers, Calvin	RRR000304 / 0001
	Myers, Stephanie	RRR000354 / 0001
	Nagle, Susan	RRR000858 / 0001
	Naranjo, Marian	RRR000810 / 0001
	Nelis, Elizabeth	RRR000966 / 0001
	Nelis, William	RRR000964 / 0001
	Nelson, Dennis	RRR000588 / 0001
	Nelson, Dennis	RRR000820 / 0001
	Nelson, Dennis	RRR000896 / 0001
	Newman, Roberta	RRR000649 / 0001
	Newman, Sarah	RRR000430 / 0001
	Newton, Sharon	RRR000982 / 0001
	Nicholl, Robert	RRR000171 / 0001
	La Comunidad	RRR000685 / 0001
	Nichols, Jean	
	Nidess, Rael	RRR000502 / 0001
	No last name given, Aaron	RRR000455 / 0001
	No last name given, Barbara	RRR000967 / 0001
	No last name given, Emily	RRR000410 / 0001
	No last name given, Jacquey	RRR001030 / 0001
	No last name given, Lindalou	RRR000423 / 0001
	No last name given, P.J.	RRR000999 / 0001
	Novick, Leah	RRR000386 / 0001

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1.1.3 (15) (continued)	ODonnell, Deb	RRR000387 / 0001
	Oberman, Robert	RRR000956 / 0001
	Oberman, Robert	RRR000963 / 0001
	Ogren, Lorrie	RRR000532 / 0001
	Sisters of St. Joseph of Carondelet	RRR000938 / 0009
	Oleskevich, Diana	
	Omuhundro, Charlotte	RRR000175 / 0001
	One Feather, Harold	RRR000937 / 0009
	Oropeza, Carlos	RRR000374 / 0001
	Orr, Lisa	RRR000616 / 0001
	Overton, Patrick	RRR000779 / 0001
	Paape, Joyce	RRR000915 / 0001
	Parise, Mary	RRR000247 / 0001
	Parks, Terry	RRR000159 / 0001
	Patrie, Lewis	RRR000597 / 0001
	Payer, Tax	RRR000188 / 0001
	Pellett, Simon	RRR000651 / 0001
	Pepin, Carolan	RRR000229 / 0001
	Perry, Sybil	RRR000598 / 0002
	Nevada Pharmacist Association	RRR000134 / 0001
	Pham, Khanh	
	Pickett, Carol	RRR000153 / 0001
	Pikus, Barbara	RRR000481 / 0001
	Plaski, Lisa	RRR000202 / 0001
		RRR001028 / 0001
	Porter, Al	RRR000180 / 0001
	Porter, Johanna	RRR000440 / 0001
	Price, Norma	RRR000143 / 0001
		RRR000246 / 0001
	Pringle, Bruce	RRR000484 / 0002
	Purpel, Elaine	RRR000473 / 0001
	Progressive Leadership Alliance of Nevada	RRR000263 / 0001
	Rake, Launce	
	Rana, Avis	RRR000719 / 0001
	Ransom, Rita	RRR000261 / 0001
	Ray, Dorothy	RRR000035 / 0001
	Reback, Mark	RRR000936 / 0009
	Rebman, Marilyn	RRR000149 / 0001
	Reese, Gary	RRR000267 / 0001
	Reese, Joy	RRR000581 / 0001
	Reilly, Jennifer	RRR000759 / 0001
	Reimer, Nancy	RRR000713 / 0001
	Southwest Worker's Union	RRR000749 / 0001
	Rendon, Genaro	
	Reuther, Sandra	RRR001073 / 0001
	Reynolds, Bruce	RRR000208 / 0001
	Reynolds-Sparks, Darla	RRR000904 / 0001
	Rhodes, Rick	RRR001023 / 0001
	Rice, Megan	RRR000300 / 0001
	Richardson, John	RRR000775 / 0001
	Richmond, Ray	RRR001083 / 0001
	Riley, Amber-Renee	RRR000800 / 0001
	Rizzo, Sandi	RRR000050 / 0001
	Robert, Rene	RRR000907 / 0001

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1.1.3 (15) (continued)	Roberts, James	RRR000510 / 0001
	Roberts, Tommy	RRR000372 / 0001
	Rohrbach, Kim	RRR000544 / 0002
	Rojas, Jessica	RRR000443 / 0001
	Rolfe, Kenneth	RRR000471 / 0001
	Rolfe, Megan	RRR000470 / 0001
		RRR000653 / 0001
	Rolofson, Kay	RRR000172 / 0001
	Romero, Bernie	RRR000996 / 0002
	Rosenthal, Judi	RRR001055 / 0001
	Ross, Candace	RRR000277 / 0001
	Ross, Robert	RRR000427 / 0001
	City of Las Vegas, Councilman Ross, Steve	RRR000268 / 0001
	Roth, Erik	RRR000930 / 0009
	Nuclear Age Peace Foundation Roth, Nick	RRR000331 / 0001
	Rothermel, Phil/Kathryn	RRR001068 / 0001
	Rouvier, Julia	RRR000570 / 0001
	Royce, Lottie	RRR000339 / 0001
	Rudestam, Kirsten	RRR000444 / 0001
	Ryan, Sheila	RRR000412 / 0001
	Rytinova, Zdenka	RRR000806 / 0001
	Saba, Marcel	RRR000796 / 0001
	Sabbadini, Gail	RRR000910 / 0001
	Salamon, Jeffrey	RRR000360 / 0001
	Sampson, Irene	RRR000124 / 0001
	Sanabria, Julie	RRR000902 / 0001
	Sanborn, Hugh	RRR000476 / 0001
	Sandness, Robert	RRR000313 / 0006
	Sanford, Warren	RRR000575 / 0001
	Veterans in Politics Sanson, Steve	RRR000295 / 0001
		RRR000356 / 0001
	Saul, Kathleen	RRR000899 / 0001
	Savage, Joan	RRR000417 / 0001
	Scheid, Ann	RRR000920 / 0001
	Sierra Safe Energy Schieffer, Richard	RRR000394 / 0001
	Schitaroff, Nina	RRR000294 / 0001
	Schlaf, Bill	RRR000955 / 0001
	Schmieding, Quentin	RRR000823 / 0001
	Schmieding, Rhea	RRR000517 / 0001
	Schmitz, Gladys	RRR000976 / 0001
	Schneider, Keri	RRR000203 / 0001
	Schneider, Seth	RRR000363 / 0001
	City of Henderson Schroder, Gerri	RRR000269 / 0001
	Sinai, Schroeder, Mooney, Boetsch, Bradley & Pace Schroeder, Theodore	RRR000352 / 0001
	Schultz, Jeffrey	RRR000884 / 0001
	Scott, Ms.	RRR000316 / 0001
	Scurlock, Rodger	RRR000764 / 0001

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1.1.3 (15) (continued)	Southern Ohio Neighbors Group	RRR000887 / 0002
	Sea, Geoffrey	
	Secor, Nathanael	RRR000401 / 0001
	Sedlock, Cheryl	RRR000426 / 0001
	Seely, Clover	RRR000913 / 0001
	Sewall, Christopher	RRR000822 / 0001
	Shahrooz, William	RRR000286 / 0002
	Sharpe, Trudy	RRR000228 / 0001
	Sheldon-Scurlock, Peggy	RRR000572 / 0001
	Shields, Randall	RRR000883 / 0001
	Shillinglaw, Fawn	RRR000688 / 0045
	Shively, Daniel	RRR000513 / 0001
	Shock, Howard	RRR001008 / 0001
	Shyduroff, Sasha	RRR000891 / 0001
	Siegel, Larry	RRR000631 / 0001
	Sill, Marjorie	RRR000042 / 0001
	Silvaggio, Janie	RRR001003 / 0001
	Silver, Sid	RRR000338 / 0001
	Simon, Laura	RRR000894 / 0001
	Sims, Marcus	RRR000449 / 0001
	Sinno, Moe	RRR000335 / 0001
	Sitnick, Leni	RRR000880 / 0001
	The Stella Group, Ltd.	RRR000848 / 0001
	Sklar, Scott	
	Slack, Susan	RRR000142 / 0001
	Smith, Jamee	RRR000761 / 0001
	Snow, Rick	RRR000049 / 0005
	Snyder, Philip	RRR000944 / 0001
	Sojourner, Mary	RRR000924 / 0001
	Sollitt, Shannyn	RRR000566 / 0001
	Solomon, Laurie	RRR000721 / 0001
		RRR000934 / 0001
	Pan-Am Legal Services	RRR000248 / 0001
	Song, Robert	
		RRR000302 / 0001
	Songer, Betty	RRR000917 / 0001
	Sorrells, Marla	RRR000909 / 0001
	Spake, Colin	RRR000853 / 0001
	St. Blaze, Scott	RRR000809 / 0001
	Stafford, Paula	RRR000771 / 0001
	Staggs, Donna	RRR000725 / 0001
	Stalsworth, Wayne	RRR000898 / 0001
	Stambaugh, Melanie	RRR000341 / 0001
	Stanton, Dolly	RRR000157 / 0001
	Stanton, William	RRR000158 / 0001
	Starr, Steven	RRR000868 / 0001
	Steinberg, Michael	RRR000918 / 0001
	Steup, John	RRR000591 / 0001
	Stewart, Max	RRR000291 / 0001
	Stewart, Valerie	RRR001043 / 0001
	Stone, Lynne	RRR000442 / 0001
	Stover, George/Sharon	RRR001032 / 0001

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1.1.3 (15) (continued)	The Toiyabe Chapter of the Sierra Club	RRR000745 / 0009
	Strickland, Rose	
	Sturonas, Mark	RRR000213 / 0001
	State of California, Dept. of Justice	RRR000659 / 0001
	Sullivan, Timothy	
	Sulock, Dot	RRR000508 / 0001
	Svien, Kaia	RRR000462 / 0001
	Swain, Lornita	RRR000911 / 0001
	Sweeney, Jay	RRR000536 / 0001
	Taber, Christina	RRR000788 / 0001
	Taino, Mark	RRR000368 / 0001
	Taylor, F.D.	RRR000859 / 0002
	Teale, Laulani	RRR000594 / 0001
	Tedesco, Concetta	RRR000843 / 0001
	Thomas, Kristen	RRR000301 / 0002
	Thomason, Amy	RRR001038 / 0001
		RRR001050 / 0001
	Thompson, Alysha	RRR000734 / 0001
	Thompson, David	RRR000735 / 0002
	Timmerman, Dan	RRR000378 / 0001
	Timmerman, Don	RRR000879 / 0002
		RRR000903 / 0002
	Tittman, Jack	RRR000965 / 0001
	Tomkins, Pat	RRR000579 / 0001
	Toste, Jeff	RRR000576 / 0001
	Tousseau, Laura	RRR000152 / 0001
	Travis, Joan	RRR000531 / 0001
	Treadway, Carolyn	RRR000445 / 0001
		RRR000583 / 0002
	Treadway, Roy	RRR000838 / 0001
	Tritt, Eleanor	RRR000133 / 0001
	Turner, Rose	RRR000169 / 0001
	Turner, Scott	RRR000845 / 0001
	Tyler, Jake	RRR000422 / 0001
	Uchino, Crystal	RRR000756 / 0001
	Uferet, Lora	RRR000947 / 0001
	Ullrich, Anita	RRR000310 / 0001
	van der Kamp, Dixie	RRR000770 / 0001
	Van Diepen, Rick	RRR000912 / 0001
	Van Druten, Sarah	RRR000777 / 0001
	Van Pelt, Pamela	RRR000135 / 0001
	Vargas, Alicia	RRR000849 / 0001
	Vasquez, David	RRR000780 / 0001
	Vatalaro, Jean	RRR000178 / 0001
	Vaught, Ron	RRR000353 / 0001
	Remnant Yuchi Nation	RRR000383 / 0001
	Vest, Lee	
	Vick, T.A.	RRR001049 / 0001
	HOME – Healing Ourselves and Mother Earth	RRR000061 / 0003
	Viereck, Jennifer	
		RRR000092 / 0001
	Vocke, Sharon	RRR000863 / 0001
	Volk, Barbara	RRR001056 / 0001
	Walen, Tommy	RRR000234 / 0001

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1.1.3 (15) (continued)	Walla, Diana	RRR000195 / 0001
	Ward, Dick/Korla	RRR000028 / 0004
	Sierra Club, Mendocino Group	RRR000816 / 0001
	Wehren, Rixanne	
	Weiskopf, Daniel	RRR000828 / 0001
	West, Cat	RRR000364 / 0002
	Wheeler, Mark	RRR000613 / 0001
	Wheeler, Wilma	RRR000147 / 0001
	Wheeler, Wilma	RRR000308 / 0001
	Whetstone, Joe	RRR000456 / 0001
	White, Andrew	RRR000783 / 0001
	Wieck, Chris	RRR000855 / 0001
	Wiegel, Ryan	RRR000064 / 0001
	Williams, Eesha	RRR000885 / 0001
	Williams, Harry	RRR000084 / 0001
	Williams, Jack	RRR000085 / 0001
	Williams, Kathy	RRR000939 / 0001
	Wilson, Bill	RRR000204 / 0001
	Wilson, Joy	RRR000086 / 0001
	Wilson, Lois	RRR000090 / 0001
	Win, Zwe	RRR001001 / 0001
	Winsten, Michele	RRR001077 / 0001
	Wood, Brad	RRR000402 / 0001
	Wood, Lea	RRR000847 / 0001
	Woolley, Dorothy	RRR000162 / 0001
	Nuclear Waste Strategy Coalition – NWSC	RRR000117 / 0001
	Wright, David	
	Wynn, Isaac	RRR000600 / 0001
	Yazzie, Penelope	RRR001015 / 0001
	Young, Aaron	RRR000919 / 0001
	Young, Joyce	RRR000128 / 0001
	Young, Peter	RRR000384 / 0001
	Yourgules-Scholes, Bella	RRR001065 / 0001
	Zarchin, Paul	RRR000628 / 0001
	Ziegler, Maggie	RRR000447 / 0001
	Zolkover, Adrian	RRR000025 / 0002
	Zuziak, Denise	RRR000773 / 0001
	Zwicker, Marie Louise	RRR000549 / 0001
1.1.4 (16)	Ace, Tom	RRR000094 / 0001
	City of Caliente	RRR000115 / 0006
	Acklin, Tom	
	Energy Communities Alliance	RRR000326 / 0001
	Akuthota, Nithin	
	Allen, Danielle	RRR000220 / 0001
	Anonymous	RRR000236 / 0001
		RRR000997 / 0001
		RRR000998 / 0001
		RRR001063 / 0001
	Andrews, Gerald	RRR001019 / 0001
	Behrendt, Tim	RRR001033 / 0001
	Nuclear Energy Institute	RRR000039 / 0001
	Binzer, Chris	
		RRR000070 / 0001
		RRR000122 / 0001

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1.1.4 (16) (continued)	U.S. Transport Council	RRR000008 / 0001
	Blee, David	
		RRR000319 / 0001
	Bolduc, William	RRR000992 / 0001
	Booe, Kenneth	RRR000968 / 0001
	Brush, Deray	RRR000132 / 0001
		RRR000257 / 0001
	Clark, Al	RRR000031 / 0001
	Clemons, Ronald	RRR000230 / 0001
	Colleen	RRR001025 / 0001
	Conley, Jack	RRR000183 / 0001
	Cooper, William	RRR001022 / 0001
	Alphatech, Inc.	RRR000137 / 0001
	Curtis, Steven	
	Dalton, Eric	RRR000970 / 0001
	DeKlever, Richard	RRR000223 / 0001
		RRR000315 / 0001
	Dean, David	RRR000222 / 0001
	Devers, Ann	RRR000709 / 0001
	Dickison, Thomas	RRR000348 / 0001
	Drost, Edward	RRR000334 / 0001
	US Nuclear Energy	RRR000037 / 0001
	Duarte, Gary	
		RRR000281 / 0001
	Public Service Commission of Wisconsin	RRR000757 / 0001
	Ebert, Daniel	
	Eichbaum, Barlane	RRR000233 / 0001
	Eichbaum, Ike	RRR000051 / 0001
	Fancher, Clyde	RRR001079 / 0004
	Finch, David	RRR000155 / 0001
	Freeman, Fred	RRR000212 / 0001
	Gaia, Fabiana	RRR000337 / 0001
	Gilliam, Lynnette	RRR000949 / 0001
	Godfrey, Marci	RRR000163 / 0001
	Goit, John	RRR000097 / 0001
	Greco, Tom	RRR000110 / 0001
	Hardacker, Tracy	RRR000842 / 0001
	Hawkins, Keith	RRR000141 / 0001
	Henderson, Matt	RRR001048 / 0001
	Higginbotham, James/Joyce	RRR001040 / 0001
	Hill, Gayle	RRR000225 / 0001
		RRR000244 / 0001
	Hollis, Charles	RRR000004 / 0001
	Hovey, Kenneth	RRR000245 / 0001
	Hulbert, Dan	RRR001053 / 0001
	Commonwealth of Virginia, Dept. of Environmental Quality	RRR000679 / 0002
	Irons, Ellie	
	Jaszczak, Cash	RRR000003 / 0001
	Johnson, Bruce	RRR000111 / 0001
	Johnson, Marcia	RRR000112 / 0001
	Kaminski, Steven	RRR000359 / 0001
	Esmeralda County	RRR000068 / 0001
	Kirby, William	

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.1.4 (16) (continued)	Nuclear Energy Institute – NEI	RRR000318 / 0001
	Kraft, Steven	
	Lightfoot, Jack	RRR000390 / 0001
	Lintner, Michael	RRR000991 / 0001
	Westinghouse	RRR000727 / 0001
	Liparulo, Nick	
	Lonsumpun	RRR001006 / 0001
	Maclean, Gary	RRR000987 / 0001
	McClellan, Scott	RRR000030 / 0001
	NEI Yucca Mountain Project	RRR000058 / 0001
	McCullum, Rod	
	Nuclear Energy Institute	RRR000279 / 0001
	McCullum, Rodney	
	Nuclear Energy Institute – NEI	RRR000620 / 0001
	McCullum, Rodney	
	Mitchell, Delbert	RRR000189 / 0001
	City of Caliente	RRR000118 / 0001
	Moore, Ashley	
	Moore, Roanne	RRR000119 / 0001
	LOC Inc. Oak Ridge Reservation Local Oversight Committee	RRR000702 / 0001
	Mulvenon, Norman	
	Myrick, Patrick	RRR000844 / 0001
	No last name given, Bob	RRR000161 / 0001
	No last name given, Dave	RRR001074 / 0001
	No last name given, Joe	RRR001062 / 0001
	National Association of Regulatory Utility Commissioners, NARUC	RRR000323 / 0001
	O'Connell, Brian	
	O'Connor, Michael	RRR000106 / 0001
	Parsons, Roland	RRR000288 / 0001
	City of Caliente	RRR000012 / 0001
	Phillips, Kevin	
		RRR000116 / 0001
	For A Better Nevada	RRR000706 / 0001
	Phillips, Kevin	
	US Transport Council	RRR000040 / 0001
	Quinn, Bob	
	Westinghouse Electric Company	RRR000221 / 0001
	Rickman, Robin	
	Rigby, Dan	RRR000041 / 0001
	Romero, Bernie	RRR000996 / 0001
	Russo, Kathy	RRR000045 / 0003
	Sandness, Robert	RRR000313 / 0002
	Schmitt, Sean	RRR000179 / 0001
	Nuclear Energy Institute	RRR000007 / 0001
	Seidler, Paul	
		RRR000057 / 0001
		RRR000278 / 0001
	Smith, Ross	RRR000358 / 0001
	Sullivan, John	RRR000972 / 0001
	Sweet, Carol	RRR001076 / 0001
	Thompson, Charles	RRR000299 / 0001
	Throckmorton, Arthur	RRR000439 / 0001
	Viata, John	RRR000303 / 0001

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1.1.4 (16) (continued)	Wadsworth, Gordon	RRR000113 / 0001
	Californians for Safe, Clean, Efficient Nuclear Power	RRR000176 / 0001
	Walker, Daniel	
	Williams, Richard	RRR001012 / 0001
	Woodward, Holly	RRR000707 / 0001
	Wright, Amber	RRR000227 / 0001
	Nuclear Waste Strategy Coalition – NWSC	RRR000117 / 0011
	Wright, David	
	Zitney, Lisa	RRR000217 / 0001
1.2 (4)	City of Reno	RRR000680 / 0002
	Cashell, Robert	
	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0003
	Loux, Robert	
		RRR000663 / 0003
	County of San Bernardino, Board of Supervisors	RRR000673 / 0002
	Mitzelfelt, Brad	
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0044
	Navis, Irene	
1.2 (9)	Alley, Charles	RRR000995 / 0019
	Consolidated Group of Tribes and Organizations	RRR000101 / 0016
	Arnold, Richard	
	Timbisha Shoshone	RRR000692 / 0002
	Beaman, Ed	
	Bechtel, Dennis	RRR000981 / 0002
	Alliance for Nuclear Responsibility	RRR000603 / 0001
	Becker, Rochelle	
	City of Reno	RRR000680 / 0001
	Cashell, Robert	
	Chang, Claire	RRR000874 / 0001
	Corneli, Helen	RRR000869 / 0001
	Regional Association of Concerned Environmentalists (RACE)	RRR000935 / 0001
	Donham, Mark	
	Fellows, Kevin	RRR000332 / 0001
	Nevada Agency for Nuclear Projects	RRR000275 / 0003
	Frishman, Steve	
	Guzman, Tony	RRR000932 / 0001
	Healing Ourselves and Mother Earth	RRR000737 / 0002
	Hadder, John	
	Haggerty, Bernard	RRR000872 / 0001
	State of Nevada, Agency for Nuclear Projects	RRR000274 / 0002
	Halstead, Robert	
	Owens Valley Indian Commission	RRR000100 / 0001
	Heil, Darla	
	Mercy Investment Program, Sisters of Mercy-Detroit,	RRR000933 / 0001
	Dominican Sisters of Hope and Ursuline Sisters of Tildonk	
	Heinonen, Valerie	
	Hilfer, Eric	RRR000645 / 0001
	Eureka County Board of Commissioners	RRR000664 / 0004
	Ithurralde, James	
	Beyond Nuclear	RRR000241 / 0001
	Kamps, Kevin	
	Beyond Nuclear	RRR000325 / 0001
	Kamps, Kevin	

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1.2 (9) (continued)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0007
	McCabe, Eileen	RRR000929 / 0001
	Moffat, Jay	RRR000834 / 0001
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0002
	Nash, Nora	RRR000931 / 0001
	Sisters of St. Joseph of Carondelet Oleskevich, Diana	RRR000938 / 0001
	One Feather, Harold	RRR000937 / 0001
	Reback, Mark	RRR000936 / 0001
	Roth, Erik	RRR000930 / 0001
	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0011
	Tuler, Seth	RRR000837 / 0006
	Western Shoshone National Council Zabarte, Ian	RRR000327 / 0004
1.2 (10)	HOME – Healing Ourselves and Mother Earth Hadder, John	RRR000046 / 0002
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0001
		RRR000013 / 0001
		RRR000056 / 0001
	Kriesler, Leonard	RRR000285 / 0001
	Russo, Kathy	RRR000045 / 0001
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000061 / 0001
1.2 (12)	Timbisha Shoshone Beaman, Ed	RRR000692 / 0013
	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0013
	California Energy Commission Boyd, James	RRR000642 / 0003
	City of Reno Cashell, Robert	RRR000680 / 0004
	DeLee, Michael	RRR000065 / 0001
	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0001
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0002
	Huston, John	RRR000015 / 0001
	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0002
		RRR000691 / 0002
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0018
	Morton, Jenna	RRR000219 / 0002
	Mullings, Diamond	RRR000769 / 0017
	Sheldon-Scurlock, Peggy	RRR000572 / 0005
	Strickland, Rose	RRR000109 / 0001
	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0011
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0017

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1.2 (12) (continued)	Alliance for Nuclear Responsibility Weisman, David	RRR000089 / 0001
	Wiegel, Ryan	RRR000064 / 0003
1.2 (13)	Alley, Charles	RRR000995 / 0001
	Alliance for Nuclear Responsibility Becker, Rochelle	RRR000603 / 0011
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0003
	Mullings, Diamond	RRR000769 / 0018
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0018
1.2 (14)	Bechtel, Dennis	RRR000981 / 0003
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0012
	Congress of the United States Reid, Harry	RRR000290 / 0002
		RRR000678 / 0014
1.2 (60)	Humboldt River Basin Water Authority Hodges, Bennie	RRR000029 / 0001
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0006
	Congress of the United States Reid, Harry	RRR000678 / 0013
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0002
1.2 (101)	Lauchengco, Dennis	RRR000199 / 0001
	JOSSCH-LLC Wetch, Joe	RRR000125 / 0001
1.2 (111)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0005
	Nevada Agency for Nuclear Projects Frishman, Steve	RRR000275 / 0002
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0004
	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0010
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0015
1.2 (276)	Bechtel, Dennis	RRR000305 / 0005
1.2 (912)	United States Environmental Protection Agency Miller, Anne	RRR000667 / 0003
1.2 (1950)	Kuehnhackl, Krista	RRR000867 / 0012
1.2 (3718)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0001
1.2.1 (46)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0003
	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0007
1.2.1 (55)	Alley, Charles	RRR000995 / 0002
	Baker, Alan	RRR000533 / 0001
	Alliance for Nuclear Responsibility Becker, Rochelle	RRR000603 / 0002
	State of Utah Chancellor, Denise	RRR000677 / 0001

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1.2.1 (55) (continued)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0002 RRR000013 / 0004 RRR000038 / 0001
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0004
	Linda, Deb	RRR000577 / 0003
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0006
	City of Caliente Phillips, Kevin	RRR000641 / 0003
	Congress of the United States Reid, Harry	RRR000290 / 0003 RRR000678 / 0001
	Strick, James	RRR000906 / 0002
	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0002
	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0001
1.2.1 (72)	Anonymous	RRR000602 / 0003
	Bechtel, Dennis	RRR000981 / 0001
	Beckwith, Nan	RRR000772 / 0003
	Bigda, Mitch	RRR001027 / 0001
	DeKlever, Richard	RRR001000 / 0001
	Public Service Commission of Wisconsin Ebert, Daniel	RRR000757 / 0002
	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0017
	Lewis, Tonya	RRR000784 / 0003
	Mullings, Diamond	RRR000769 / 0011
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0001
	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0043
	Sheldon-Scurlock, Peggy	RRR000572 / 0003
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0017
	Stafford, Paula	RRR000771 / 0003
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0011
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0001
	Zuziak, Denise	RRR000773 / 0003
1.2.1 (113)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0015
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0003
	Congress of the United States Reid, Harry	RRR000290 / 0001
	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0008
1.2.1 (156)	Alliance for Nuclear Responsibility Becker, Rochelle	RRR000603 / 0004

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1.2.1 (156) (continued)	California Energy Commission Boyd, James	RRR000642 / 0001
	State of California, California Energy Commission Byron, Barbara	RRR000043 / 0001
		RRR000108 / 0001
	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0002
	Alliance for Nuclear Responsibility Weisman, David	RRR000089 / 0002
	Alliance for Nuclear Responsibility Weisman, David	RRR000120 / 0001
1.2.1 (1862)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0006
1.2.1 (2387)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0012
1.2.1 (3719)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0002
1.2.1 (3721)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0004
1.2.2 (50)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0003
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0001
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0002
		RRR000663 / 0001
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0002
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0001
	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0001
1.2.3 (25)	CSG Midwest Beetem, Jane	RRR000655 / 0001
	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0038
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0001
	Maryland Dept. of Planning Janey, Linda	RRR000129 / 0002
		RRR000306 / 0001
	Maryland Dept. of the Environment Mueller, Joanne	RRR000027 / 0001
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0004
1.2.3 (4013)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0008
1.2.4 (26)	Nye County, Board of Commissioners Borasky, Butch	RRR000055 / 0001
	Nye County, Board of County Commissioners Eastley, Joni	RRR000054 / 0001

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1.2.4 (26) (continued)	Nye County, Board of County Commissioners Eastley, Joni	RRR000240 / 0001 RRR000657 / 0007
	Nye County, Board of County Commissioners Hollis, Gary	RRR000081 / 0001 RRR000271 / 0001 RRR000320 / 0001
	Nye County Nuclear Waste Repository Project Office Jaszczak, Cash	RRR000044 / 0001
1.2.4 (1894)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0009
1.2.5 (2159)	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0006
1.2.6 (27)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0012
	Bechtel, Dennis	RRR000305 / 0003 RRR000981 / 0007
	City of Reno Cashell, Robert	RRR000680 / 0011
	Regional Association of Concerned Environmentalists (RACE) Donham, Mark	RRR000935 / 0006
	Fretheim, Paul	RRR000093 / 0002
	Givens, Nancy	RRR000479 / 0005
	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0019
	Headington, Vincent	RRR000815 / 0001
	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk Heinonen, Valerie	RRR000933 / 0008
	Beyond Nuclear Kamps, Kevin	RRR000241 / 0008
	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0007
	Environment America Linder, Josh	RRR000328 / 0003
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0039
	McCabe, Eileen	RRR000929 / 0011
	Morton, Jenna	RRR000219 / 0001
	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0001
	Sisters of St. Joseph of Carondelet Oleskevich, Diana	RRR000938 / 0008
	One Feather, Harold	RRR000937 / 0008
	Reback, Mark	RRR000936 / 0008
	Roth, Erik	RRR000930 / 0008
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0003
	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0009
	Tuler, Seth	RRR000837 / 0001
	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0014

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1.2.6 (27) (continued)		RRR000276 / 0003
		RRR000327 / 0003
		RRR000347 / 0003
1.3.1 (344)	Clark County Nuclear Waste Program	RRR000280 / 0003
	Navis, Irene	
1.3.1 (491)	Inyo County, Board of Supervisors	RRR000396 / 0011
	Bilyeu, Jim	
1.3.1 (577)	Concern Citizens of Amargosa Valley	RRR000104 / 0001
	Boydston, Donald	
1.3.1 (944)	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0001
	Loux, Robert	
1.3.1 (956)	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0007
	Loux, Robert	
1.3.1 (1324)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0258
	Hornbeck, Ronda	
1.3.1 (1641)	Chelette, Iona	RRR000550 / 0017
1.3.1 (1658)	Chelette, Iona	RRR000550 / 0019
1.3.1 (1732)	Nye County, Board of County Commissioners	RRR000657 / 0040
	Eastley, Joni	
1.3.1 (1857)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0001
	Gray, Charles	
1.3.1 (1861)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0005
	Gray, Charles	
1.3.1 (1906)	State of Utah	RRR000677 / 0013
	Chancellor, Denise	
1.3.1 (1932)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0021
	Gray, Charles	
1.3.1 (2294)	County of San Bernardino, Board of Supervisors	RRR000673 / 0003
	Mitzelfelt, Brad	
1.3.1 (2782)	Cameron, Jan	RRR000105 / 0002
1.3.1 (2905)	CSG Midwest	RRR000655 / 0011
	Beetem, Jane	
1.3.1 (3145)	Western Shoshone National Council	RRR000121 / 0010
	Zabarte, Ian	
1.3.1 (3239)	Tieri, Anna	RRR001054 / 0002
1.3.1 (3715)	Dziegiel, Henry	RRR000264 / 0001
1.3.1 (3828)	City of Henderson	RRR000269 / 0003
	Schroder, Gerri	
1.3.1 (3829)	Clark County	RRR000270 / 0003
	Brager, Susan	
1.3.1 (3913)	Healing Ourselves and Mother Earth	RRR000737 / 0003
	Hadder, John	
1.3.1 (3971)	Consolidated Group of Tribes and Organizations	RRR000671 / 0010
	Arnold, Richard	
1.3.1 (4121)	Alley, Charles	RRR000995 / 0022
1.3.1 (4165)	Timbisha Shoshone	RRR000692 / 0001
	Beaman, Ed	
	Western Shoshone National Council	RRR000276 / 0002
	Zabarte, Ian	
		RRR000327 / 0002
		RRR000347 / 0002

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1.3.1 (4169)	State of Utah Chancellor, Denise	RRR000677 / 0012
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0266
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0040
	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0022
		RRR000691 / 0053
	County of San Bernardino, Board of Supervisors Mitzelfelt, Brad	RRR000673 / 0006
	City of Las Vegas, Councilman Ross, Steve	RRR000268 / 0002
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0011
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0007
	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0004
1.3.2 (4167)	Abraham, Natalie	RRR000790 / 0002
	Anonymous	RRR000425 / 0002
		RRR000602 / 0002
		RRR001057 / 0002
	Barnell, Todd	RRR000730 / 0003
	Barnes, Kathryn	RRR000562 / 0003
	Bartholomew, Alice	RRR000529 / 0003
	Bauer, Benjamin	RRR000782 / 0002
	Beckwith, Nan	RRR000589 / 0002
	Bernard, Larry	RRR000551 / 0003
		RRR000728 / 0002
	Berrigan, Gail	RRR000763 / 0002
	Western Shoshone Defense Project Bill, Larson	RRR000686 / 0002
	Women's International League for Peace and Freedom Birnie, Patricia	RRR000862 / 0002
	Block, Dixie	RRR000768 / 0002
	Bodde, Mary	RRR000497 / 0002
	Boeve, May	RRR000380 / 0003
	Bonds, Julia	RRR000403 / 0004
	Boyce, James	RRR000793 / 0002
	Bravo, Eliseo	RRR000797 / 0002
	Rainforest Action Network Brune, Mike	RRR000705 / 0002
	Buonaiuto, Shelley	RRR000684 / 0002
	California Valley Miwok Tribe Burley, Silvia	RRR000751 / 0002
	Bush, Pat	RRR000787 / 0002
	Carnine, Berkley	RRR000747 / 0002
	Cashel, Kathleen	RRR000556 / 0002
	Castleberry, George	RRR000731 / 0003
	Chester, Greg	RRR000406 / 0001
	Christian, Amy	RRR000698 / 0002
	Christine, Alexi	RRR000794 / 0002

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1.3.2 (4167) (continued)	Conroy, Barbara	RRR000711 / 0002
	Corwin, Stanley	RRR000752 / 0002
	Covington, Cathy	RRR000492 / 0002
	Cox, Mike	RRR000921 / 0002
	Daggett, Becky	RRR000733 / 0003
	Davies, William	RRR000792 / 0002
	DePauw, Jolie	RRR000852 / 0002
	Devine, Don	RRR000459 / 0002
	DiSalvo, Nicole	RRR000704 / 0002
	Dillion, Teri	RRR000561 / 0002
	Northeast Pa. Audubon Society	RRR000876 / 0002
	Dodge, Katharine	
	Regional Association of Concerned Environmentalists (RACE)	RRR000935 / 0003
	Donham, Mark	
	Durante, Charles	RRR000429 / 0002
	Emerson, Eric	RRR000871 / 0001
	Estey, Kara	RRR000750 / 0002
	Farias, Corinne	RRR000424 / 0002
	Felich, Tara	RRR000748 / 0002
	Fitzell, Anne	RRR000592 / 0002
	Fox, William/Myrna	RRR000926 / 0001
	Fujiyoshi, Ronald	RRR000724 / 0002
	Gagnon, Lisa	RRR000540 / 0001
	Givens, Nancy	RRR000479 / 0001
	Godinez, Jacob	RRR000789 / 0002
	Goodison, Jason	RRR000776 / 0002
	Grant, Patrick	RRR000741 / 0003
	Green, Karen	RRR000565 / 0002
	Greenhaw, Rhonda	RRR000520 / 0003
	Griffith, Linda	RRR000365 / 0001
	Grote, Jennifer	RRR000165 / 0002
	Guzman, Tony	RRR000932 / 0004
	Haas, Shannon	RRR000766 / 0002
	HOME – Healing Ourselves and Mother Earth	RRR000046 / 0001
	Hadder, John	
	Hagan, Tootie	RRR000400 / 0001
	Hall, James	RRR000744 / 0002
	Harden, Cory/Martha	RRR000404 / 0002
	Haslam, Malissa	RRR000695 / 0002
	Hatley, Earl	RRR000420 / 0003
	Hatt, Greg	RRR000795 / 0002
	SENAA West	RRR000746 / 0002
	Hayes, Sara	
	Haymaker, Annie	RRR000506 / 0001
	Illegible	RRR000573 / 0003
	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk	RRR000933 / 0004
	Heinonen, Valerie	
	Hernesman, Barbara	RRR000908 / 0002
	Higginson, Judy	RRR000928 / 0002
	Holzberg, Steve	RRR000491 / 0003
	Huffman, Garrett	RRR000786 / 0002
	Irwin, Larry	RRR000478 / 0002

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1.3.2 (4167) (continued)	James, Earl	RRR000927 / 0002
	Johnston, Jill	RRR000590 / 0002
	Jones, Barbara	RRR000564 / 0002
	Beyond Nuclear	RRR000241 / 0005
	Kamps, Kevin	RRR000325 / 0007
	Karas, Anna	RRR000743 / 0002
	Timbisha Shoshone	RRR000690 / 0008
	Kennedy, Joe	
	Keyes, Janice	RRR000593 / 0002
	Kincaide, Delores	RRR000941 / 0002
	Landguth, David	RRR000755 / 0002
		RRR000781 / 0002
	Lewis, Tonya	RRR000784 / 0002
	Lincoln, Robert	RRR000552 / 0002
	Linda, Deb	RRR000577 / 0006
	Linda, Tom	RRR000732 / 0003
	Lupo, Vivian	RRR000774 / 0001
	Macy, Joanna	RRR000753 / 0001
	Maestas, Lisa	RRR000785 / 0002
	Mallory, Kelli	RRR000791 / 0002
	Manion, Patricia	RRR000697 / 0002
	Maniscalco, Peter	RRR000940 / 0002
	Mareck, Katherine	RRR000571 / 0003
	Marsh, Amy	RRR000560 / 0002
	Matsuda, Thomas	RRR000399 / 0002
	Matsuda, Thomas	RRR000762 / 0002
	Matt, Jane	RRR000739 / 0002
	Mayo, Paul	RRR000897 / 0002
	Mazzotti, Amanda	RRR000736 / 0002
	McCabe, Eileen	RRR000929 / 0007
	McMullen, Penelope	RRR000877 / 0002
	Medina, Amanda	RRR000700 / 0002
	Alliance for Nuclear Accountability	RRR000726 / 0003
	Meyer, Alfred	
	Miller, Katya	RRR000699 / 0002
	Miller, Virginia	RRR000833 / 0002
	Duckwater Shoshone Tribe	RRR000693 / 0015
	Millett, Jerry	
	Minch, Allen	RRR000767 / 0002
	Mizdrak, Marko	RRR000778 / 0002
	Big Pine Paiute Tribe of the Owens Valley	RRR000675 / 0004
	Moose, Virgil	
	Western Shoshone National Council	RRR000865 / 0001
	Moss, Allen	
	Mullings, Diamond	RRR000769 / 0005
	Nelson, Dennis	RRR000820 / 0002
	Indigenous Law Institute	RRR000660 / 0001
	Newcomb, Steven	
	La Comunidad	RRR000685 / 0002
	Nichols, Jean	
	Sisters of St. Joseph of Carondelet	RRR000938 / 0004
	Oleskevich, Diana	

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1.3.2 (4167) (continued)	One Feather, Harold	RRR000937 / 0005
	Overton, Patrick	RRR000779 / 0002
	Pellett, Simon	RRR000651 / 0002
	Pringle, Bruce	RRR000484 / 0001
	Quiroz, Mike	RRR000535 / 0001
	Reback, Mark	RRR000936 / 0005
	Reimer, Nancy	RRR000713 / 0002
	Southwest Worker's Union	RRR000749 / 0003
	Rendon, Genaro	
	Richardson, John	RRR000775 / 0002
	Richmond, Ray	RRR001083 / 0002
	Riley, Amber-Renee	RRR000800 / 0002
	Rohrbach, Kim	RRR000544 / 0001
	Rolfe, Kenneth	RRR000471 / 0002
	Rolfe, Megan	RRR000470 / 0002
		RRR000653 / 0002
	Roth, Erik	RRR000930 / 0005
	Rouvier, Julia	RRR000570 / 0003
	Russo, Kathy	RRR000045 / 0002
	Saba, Marcel	RRR000796 / 0002
	Sanford, Warren	RRR000575 / 0003
	Scurlock, Rodger	RRR000764 / 0003
	Seely, Clover	RRR000913 / 0003
	Sewall, Christopher	RRR000822 / 0002
	Shillinglaw, Fawn	RRR000688 / 0067
	Siegel, Larry	RRR000631 / 0005
	Smith, Jamee	RRR000761 / 0002
	Sojourner, Mary	RRR000924 / 0002
	Sollitt, Shannyn	RRR000566 / 0002
	Solomon, Laurie	RRR000721 / 0006
		RRR000934 / 0007
	Stafford, Paula	RRR000771 / 0002
	Staggs, Donna	RRR000725 / 0002
	Steup, John	RRR000591 / 0002
	Swain, Lornita	RRR000911 / 0002
	Taber, Christina	RRR000788 / 0002
	Taylor, F.D.	RRR000859 / 0001
	Thompson, Alysha	RRR000734 / 0002
	Thompson, David	RRR000735 / 0001
	Timmerman, Don	RRR000879 / 0001
		RRR000903 / 0001
	Treadway, Carolyn	RRR000445 / 0004
		RRR000583 / 0001
	Uchino, Crystal	RRR000756 / 0002
	van der Kamp, Dixie	RRR000770 / 0002
	Van Druten, Sarah	RRR000777 / 0002
	Vasquez, David	RRR000780 / 0002
	HOME – Healing Ourselves and Mother Earth	RRR000061 / 0004
	Viereck, Jennifer	
		RRR000712 / 0005
	Corporation of Newe Sogobia	RRR000836 / 0001
	Wells, John	
	White, Andrew	RRR000783 / 0002

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1.3.2 (4167) (continued)	Williams, Kathy	RRR000939 / 0002
	Wood, Lea	RRR000714 / 0004
	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0005
	Zuziak, Denise	RRR000773 / 0002
	Zwicker, Marie Louise	RRR000549 / 0004
1.3.2 (4184)	Shillinglaw, Fawn	RRR000688 / 0059
	Strickland, Rose	RRR000109 / 0002
1.3.3 (427)	Congress of the United States Reid, Harry	RRR000290 / 0006
1.3.3 (674)	Ross, Robert	RRR000427 / 0002
1.3.3 (885)	DeKlever, Richard	RRR000223 / 0002
1.3.3 (908)	United States Environmental Protection Agency Miller, Anne	RRR000667 / 0001
1.3.3 (935)	Treadway, Carolyn	RRR000445 / 0003
1.3.3 (1000)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0002
1.3.3 (1003)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0005
1.3.3 (1737)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0016
1.3.3 (1860)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0004
1.3.3 (2813)	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0016
1.3.3 (2843)	Gagnon, Lisa	RRR000540 / 0007
1.3.3 (2960)	CSG Midwest Beetem, Jane	RRR000655 / 0008
1.3.3 (3412)	Treadway, Carolyn	RRR000583 / 0004
1.3.3 (3541)	Strick, James	RRR000906 / 0001
1.3.3 (3713)	DeKlever, Richard	RRR000223 / 0004
1.3.3 (3914)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0013
1.3.3 (3963)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0005
1.3.3 (4025)	Alley, Charles	RRR000995 / 0012
1.3.3 (4082)	Alley, Charles	RRR000995 / 0020
1.3.3 (4115)	Murray, Jacqueline	RRR000369 / 0002
1.3.3 (4168)	Timbisha Shoshone Beaman, Ed	RRR000692 / 0011
	Alliance for Nuclear Responsibility Becker, Rochelle	RRR000603 / 0010
	Benti, Wynne	RRR000071 / 0005
	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0010
	Boeve, May	RRR000380 / 0002
	California Energy Commission Boyd, James	RRR000642 / 0025
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000082 / 0002
	Garrett, Jo Anne	RRR000694 / 0002

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1.3.3 (4168) (continued)	HOME – Healing Ourselves and Mother Earth Hadder, John	RRR000046 / 0004
	Marsh, Amy	RRR000560 / 0005
	Physicians for Social Responsibility McCally, Michael	RRR000861 / 0002
	Alliance for Nuclear Accountability Meyer, Alfred	RRR000726 / 0005
	Mullings, Diamond	RRR000769 / 0016
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0008
	Slack, Susan	RRR000142 / 0005
1.3.3 (4228)	DeKlever, Richard	RRR000315 / 0004 RRR001000 / 0002
1.4.1 (49)	Bonds, Julia	RRR000403 / 0010
	California Energy Commission Boyd, James	RRR000642 / 0007
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000059 / 0006
	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0005
	Greenhaw, Rhonda	RRR000520 / 0009
	Harden, Cory/Martha	RRR000404 / 0008
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0017
	Seely, Clover	RRR000913 / 0009
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0005
	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0011
1.4.4 (29)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0003
	Cast, Dom	RRR000126 / 0002
	Collins-Ranadive, Gail	RRR000349 / 0001
	Nevada Agency for Nuclear Projects Frishman, Steve	RRR000275 / 0001
	Givens, Nancy	RRR000479 / 0008
	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0018
	Hornbeck Law Office Hornbeck, David	RRR000192 / 0001
	Hudig, Dorothy	RRR000145 / 0001 RRR000307 / 0001
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0005
	Marchese, John	RRR000173 / 0003
	Marchese, Rich	RRR000174 / 0003
	Meikle, John	RRR000150 / 0001
	Alliance for Nuclear Accountability Meyer, Alfred	RRR000330 / 0004
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0016

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1.4.4 (29) (continued)	City of Caliente	RRR000641 / 0004
	Phillips, Kevin	
	Progressive Leadership Alliance of Nevada	RRR000262 / 0001
	Rake, Launce	
	Nuclear Age Peace Foundation	RRR000331 / 0002
	Roth, Nick	
	Shillinglaw, Fawn	RRR000688 / 0044
	Smith, Catherine	RRR000146 / 0001
	The Toiyabe Chapter of the Sierra Club	RRR000745 / 0003
	Strickland, Rose	
	Nuclear Waste Strategy Coalition – NWSC	RRR000117 / 0009
	Wright, David	
1.4.5 (30)	Givens, Nancy	RRR000479 / 0006
	Clark County Nuclear Waste Program	RRR000280 / 0007
	Navis, Irene	
	Nidess, Rael	RRR000502 / 0002
	Orr, Lisa	RRR000616 / 0002
	Californians for Safe, Clean, Efficient Nuclear Power	RRR000176 / 0010
	Walker, Daniel	
1.4.6 (31)	Cast, Dom	RRR000127 / 0001
	Chelette, Iona	RRR000550 / 0009
	Twin Springs Ranch	RRR000075 / 0004
	Fallini, Joe	
	Inyo County, Yucca Mountain Repository Assessment Office	RRR000082 / 0004
	Gaffney, Matt	
	Greene, Eileen	RRR000994 / 0003
	Beyond Nuclear	RRR000260 / 0001
	Kamps, Kevin	
	Melvin, Jerry	RRR000962 / 0001
	Nole, Zeb	RRR000287 / 0001
	City of Caliente	RRR000012 / 0002
	Phillips, Kevin	
		RRR000116 / 0002
	Las Vegas Indian Center	RRR000283 / 0002
	Reed, Debra	
	Sandness, Robert	RRR000313 / 0005
	Vesperman, Gary	RRR000265 / 0001
	New Energy Corporation	RRR000293 / 0001
	Vesperman, Gary	
	Ward, Dick/Korla	RRR000028 / 0005
	Corporation of Newe Sogobia	RRR000836 / 0003
	Wells, John	
	JOSSCH-LLC	RRR000011 / 0001
	Wetch, Joe	
		RRR000125 / 0002
	Wetzel, Robert	RRR000216 / 0001
	Zolkover, Adrian	RRR000025 / 0005
1.6.1 (67)	Alley, Charles	RRR000995 / 0007
	Consolidated Group of Tribes and Organizations	RRR000671 / 0003
	Arnold, Richard	
	Brown, Richard	RRR000024 / 0003
	State of Utah	RRR000677 / 0002
	Chancellor, Denise	
	Chelette, Iona	RRR000550 / 0018

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1.6.1 (67) (continued)	Emerson, Eric	RRR000871 / 0002
	Haggerty, Bernard	RRR000872 / 0003
	State of Nevada, Agency for Nuclear Projects Hall, Jim	RRR000321 / 0002
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0014
	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0006
	Physicians for Social Responsibility Parillo, Jill	RRR000329 / 0001
	Shillinglaw, Fawn	RRR000688 / 0004
	Tuler, Seth	RRR000837 / 0003
	Williams, Harry	RRR000103 / 0002
	Wood, Lea	RRR000714 / 0003
1.6.2 (5)	Shillinglaw, Fawn	RRR000688 / 0006
1.6.2 (44)	Bartholomew, Alice	RRR000529 / 0011
	Bonds, Julia	RRR000403 / 0013
	Covington, Cathy	RRR000492 / 0010
	Greenhaw, Rhonda	RRR000520 / 0012
	Harden, Cory/Martha	RRR000404 / 0011
	Holzberg, Steve	RRR000491 / 0011
	Mullings, Diamond	RRR000769 / 0013
	Seely, Clover	RRR000913 / 0012
	Siegel, Larry	RRR000631 / 0013
	Solomon, Laurie	RRR000721 / 0004 RRR000934 / 0004
	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0008
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0013
1.6.2 (51)	Anonymous	RRR000586 / 0005
	Barnell, Todd	RRR000730 / 0010
	Bartholomew, Alice	RRR000529 / 0015
	Bechtel, Dennis	RRR000981 / 0009
	Bonds, Julia	RRR000403 / 0017
	California Energy Commission Boyd, James	RRR000642 / 0014
	Castleberry, George	RRR000731 / 0010
	Covington, Cathy	RRR000492 / 0014
	Daggett, Becky	RRR000733 / 0010
	Giese, Mark	RRR000574 / 0004
	Grant, Patrick	RRR000741 / 0010
	Greenhaw, Rhonda	RRR000520 / 0015
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000038 / 0005 RRR000056 / 0007
	Harden, Cory/Martha	RRR000404 / 0014
	Haymaker, Annie	RRR000506 / 0006
	Holzberg, Steve	RRR000491 / 0015
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0024
	Illegible	RRR000573 / 0010
	Irwin, Larry	RRR000478 / 0008

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1.6.2 (51) (continued)	Karpen, Leah	RRR000578 / 0003
	Linda, Deb	RRR000577 / 0013
	Linda, Tom	RRR000732 / 0010
	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0023
	Loux, Robert	RRR000663 / 0026
	Mareck, Katherine	RRR000571 / 0010
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0017
	Navis, Irene	
	Rouvier, Julia	RRR000570 / 0010
	Sanford, Warren	RRR000575 / 0010
	Scurlock, Rodger	RRR000764 / 0010
	Seely, Clover	RRR000913 / 0015
	Siegel, Larry	RRR000631 / 0017
	White Pine Nuclear Waste Project Office	RRR000522 / 0008
	Simon, Mike	
	Zwicker, Marie Louise	RRR000549 / 0012
1.6.2 (52)	Alley, Charles	RRR000995 / 0013
	State of California, California Energy Commission	RRR000108 / 0003
	Byron, Barbara	
	State of Utah	RRR000677 / 0009
	Chancellor, Denise	
	Chelette, Iona	RRR000550 / 0010
	Twin Springs Ranch	RRR000075 / 0002
	Fallini, Joe	
	Eureka County Board of Commissioners	RRR000664 / 0034
	Ithurralde, James	
	Beyond Nuclear	RRR000241 / 0009
	Kamps, Kevin	
	Environment America	RRR000328 / 0004
	Linder, Josh	
1.6.2 (62)	Timbisha Shoshone	RRR000692 / 0009
	Beaman, Ed	
	Alliance for Nuclear Responsibility	RRR000603 / 0003
	Becker, Rochelle	
	Inyo County, Board of Supervisors	RRR000396 / 0008
	Bilyeu, Jim	
	State of California, California Energy Commission	RRR000108 / 0005
	Byron, Barbara	
	Cecil, Pat	RRR000091 / 0003
	County of Inyo, Yucca Mountain Repository Assessment Office	RRR000239 / 0007
	Gaffney, Matt	
	State of California, Dept. of Justice	RRR000659 / 0009
	Sullivan, Timothy	
1.6.2 (164)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0026
	Gray, Charles	
	Eureka County Board of Commissioners	RRR000664 / 0036
	Ithurralde, James	
	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0022
	Loux, Robert	
	Western Interstate Energy Board – WIEB	RRR000661 / 0017
	Williams, Jim	

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1.6.2 (253)	State of Nevada, Agency for Nuclear Projects Hall, Jim	RRR000321 / 0001
1.6.2 (715)	Pringle, Bruce	RRR000484 / 0004
1.6.2 (1177)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0053
1.6.2 (1363)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0246
1.6.2 (1364)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0247
1.6.2 (1365)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0248
1.6.2 (1395)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0021
1.6.2 (1449)	Kuehnhackl, Krista	RRR000867 / 0005
1.6.2 (1627)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0003 RRR000691 / 0003
1.6.2 (1822)	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0005
1.6.2 (1897)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0012
1.6.2 (1934)	State of Utah Chancellor, Denise	RRR000677 / 0010
1.6.2 (1959)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0022
1.6.2 (2148)	Chelette, Iona	RRR000550 / 0004
1.6.2 (2162)	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0009
1.6.2 (2467)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0038
1.6.2 (2657)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0005
1.6.2 (2664)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0007
1.6.2 (2806)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0013
1.6.2 (2868)	Solomon, Laurie	RRR000721 / 0008 RRR000934 / 0006
1.6.2 (2906)	CSG Midwest Beetem, Jane	RRR000655 / 0010
1.6.2 (3015)	Alliance for Nuclear Responsibility Becker, Rochelle	RRR000603 / 0006
	Alliance for Nuclear Responsibility Weisman, David	RRR000120 / 0003
1.6.2 (3095)	Alley, Charles	RRR000995 / 0024
1.6.2 (3100)	Alley, Charles	RRR000995 / 0025
1.6.2 (3402)	Kirby, William	RRR000235 / 0005
1.6.2 (3648)	Lim, Kingman	RRR000373 / 0005
1.6.2 (3743)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000666 / 0004
1.6.2 (4077)	Alley, Charles	RRR000995 / 0017

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1.6.2.1 (61)	Barnell, Todd	RRR000730 / 0007
	Bartholomew, Alice	RRR000529 / 0009
	Alliance for Nuclear Responsibility	RRR000603 / 0009
	Becker, Rochelle	
	Bonds, Julia	RRR000403 / 0011
	Bourgoin, Ron	RRR001026 / 0001
	Castleberry, George	RRR000731 / 0007
	Chelette, Iona	RRR000550 / 0015
	Cooley, Marian	RRR000487 / 0002
	Covington, Cathy	RRR000492 / 0008
	Cullen, Noreen	RRR000475 / 0002
	Daggett, Becky	RRR000733 / 0007
	DeMare, Joseph	RRR000595 / 0002
	Fellows, Richard	RRR000900 / 0001
	Fox, Vicki	RRR000495 / 0002
	Gere, Kathy	RRR000624 / 0001
	Grant, Patrick	RRR000741 / 0007
	Greenhaw, Rhonda	RRR000520 / 0010
	Harden, Cory/Martha	RRR000404 / 0009
	Hatley, Earl	RRR000420 / 0001
	Haymaker, Annie	RRR000506 / 0007
	Owens Valley Indian Commission	RRR000100 / 0004
	Heil, Darla	
	Henning, Bill	RRR001018 / 0001
	Holmes-Litvak, Veronika	RRR001029 / 0001
	Holzberg, Steve	RRR000491 / 0009
	Houston, James	RRR000985 / 0001
	Illegible	RRR000573 / 0007
	Eureka County Board of Commissioners	RRR000664 / 0037
	Ithurralde, James	
	Beyond Nuclear	RRR000237 / 0001
	Kamps, Kevin	
	Beyond Nuclear	RRR000357 / 0001
	Kamps, Kevin	
	Lehman, Mary	RRR000606 / 0002
	Linda, Deb	RRR000577 / 0002
	Linda, Tom	RRR000732 / 0007
	Mareck, Katherine	RRR000571 / 0007
	County of San Bernardino, Board of Supervisors	RRR000673 / 0005
	Mitzelfelt, Brad	
	Morano, Lana	RRR000465 / 0001
	Mullings, Diamond	RRR000769 / 0015
	Perry, Sybil	RRR000598 / 0001
	Piszczekand, Rosemary	RRR001020 / 0001
	Pope, Kay	RRR000922 / 0001
	Rana, Avis	RRR000719 / 0002
	Rogers, Philip	RRR001021 / 0001
	Rouvier, Julia	RRR000570 / 0007
	Sanford, Warren	RRR000575 / 0007
	Scurlock, Rodger	RRR000764 / 0007
	Seely, Clover	RRR000913 / 0010
	Shillinglaw, Fawn	RRR000688 / 0022

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1.6.2.1 (61) (continued)	Siegel, Larry	RRR000631 / 0011
	Sill, Marjorie	RRR000042 / 0005
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0015
	Volpe-Gunsell, Amie	RRR000703 / 0001
	Wiegel, Ryan	RRR000064 / 0002
	Wood, Lea	RRR000714 / 0002
	Zwicker, Marie Louise	RRR000549 / 0002
1.6.2.2 (1714)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0011
1.6.2.2 (1886)	Givens, Nancy	RRR000479 / 0003
1.6.2.2 (2772)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0010
1.6.2.2 (2837)	CSG Midwest Beetem, Jane	RRR000655 / 0013
1.6.2.2 (2985)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0016
1.6.2.5 (141)	CSG Midwest Beetem, Jane	RRR000655 / 0012
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0025
	Sandness, Robert	RRR000313 / 0008
	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0019
1.6.2.5 (142)	Alliance for Nuclear Accountability Meyer, Alfred	RRR000726 / 0007
	Vandenbosch, Robert/Susanne	RRR000232 / 0002
1.6.2.5 (143)	Alley, Charles	RRR000995 / 0010
	Greene, Eileen	RRR000994 / 0002
1.6.2.5 (143) (continued)	Sandness, Robert	RRR000313 / 0009
1.6.2.5 (144)	Sandness, Robert	RRR000313 / 0010
	Snow, Rick	RRR000049 / 0003
	Alliance for Nuclear Responsibility Weisman, David	RRR000089 / 0005
	Zolkover, Adrian	RRR000025 / 0006
1.6.2.5 (155)	CSG Midwest Beetem, Jane	RRR000655 / 0002
	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0003
1.6.2.5 (163)	State of Utah Chancellor, Denise	RRR000677 / 0004
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000038 / 0006
		RRR000056 / 0009
		RRR000274 / 0003
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0019
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0005
	Shillinglaw, Fawn	RRR000688 / 0021
	Nuclear Waste Strategy Coalition – NWSC Wright, David	RRR000117 / 0002

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1.6.2.5 (165)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0001
1.6.2.5 (383)	Smith, Doug	RRR000060 / 0001
1.6.2.5 (980)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0020
1.6.2.5 (984)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0026
1.6.2.5 (997)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0038
1.6.2.5 (1069)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0111
1.6.2.5 (1941)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0100
1.6.2.5 (2573)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0002
1.6.2.5 (2835)	CSG Midwest Beetem, Jane	RRR000655 / 0015
1.6.2.5 (2836)	CSG Midwest Beetem, Jane	RRR000655 / 0014
1.6.2.5 (2907)	CSG Midwest Beetem, Jane	RRR000655 / 0009
1.6.2.5 (3815)	Sandness, Robert	RRR000313 / 0007
1.6.2.5 (4021)	Alley, Charles	RRR000995 / 0011
1.6.2.6 (2897)	Shillinglaw, Fawn	RRR000688 / 0025
1.6.2.7 (356)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0009
1.6.2.7 (431)	Alliance for Nuclear Responsibility Weisman, David	RRR000089 / 0004
1.6.2.7 (565)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0005
1.6.2.7 (637)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0003
1.6.2.7 (726)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000322 / 0001
1.6.2.7 (815)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000069 / 0001
1.6.2.7 (985)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0028
1.6.2.7 (986)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0024
1.6.2.7 (989)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0029
1.6.2.7 (990)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0031
1.6.2.7 (991)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0032
1.6.2.7 (993)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0034
1.6.2.7 (994)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0035
1.6.2.7 (1267)	Snow, Rick	RRR000049 / 0004
1.6.2.7 (2490)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0023
1.6.2.7 (2672)	Timbisha Shoshone	RRR000692 / 0010

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	Beaman, Ed	
1.6.2.7 (3014)	Alliance for Nuclear Responsibility	RRR000603 / 0005
	Becker, Rochelle	
	Alliance for Nuclear Responsibility	RRR000120 / 0002
	Weisman, David	
1.6.2.7 (3170)	Timbisha Shoshone	RRR000691 / 0055
	Kennedy, Joe	
1.6.2.7 (3181)	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0030
	Loux, Robert	
1.6.2.7 (3646)	Lim, Kingman	RRR000373 / 0003
1.6.2.7 (3699)	Huston/Cole, John/Jan	RRR000317 / 0007
1.6.2.7 (3979)	Western Shoshone National Council	RRR000121 / 0018
	Zabarte, Ian	
1.6.2.7 (3987)	State of California, California Energy Commission	RRR000108 / 0009
	Byron, Barbara	
1.6.3 (70)	State of Utah	RRR000677 / 0005
	Chancellor, Denise	
	Healing Ourselves and Mother Earth	RRR000737 / 0010
	Hadder, John	
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0003
	Navis, Irene	
	Congress of the United States	RRR000678 / 0004
	Reid, Harry	
1.6.3 (73)	California Energy Commission	RRR000642 / 0023
	Boyd, James	
	Gagnon, Lisa	RRR000540 / 0004
	Eureka County Board of Commissioners	RRR000664 / 0045
	Ithurralde, James	
	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0008
	Loux, Robert	
	Alliance for Nuclear Accountability	RRR000330 / 0001
	Meyer, Alfred	
	Congress of the United States	RRR000678 / 0005
	Reid, Harry	
	Shillinglaw, Fawn	RRR000688 / 0013
	Slack, Susan	RRR000142 / 0004
	Tomkins, Pat	RRR000579 / 0002
	Nevada Nuclear Waste Task Force, Inc.	RRR000622 / 0006
	Treichel, Judy	
1.6.3 (74)	California Energy Commission	RRR000642 / 0024
	Boyd, James	
	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk	RRR000933 / 0005
	Heinonen, Valerie	
	Beyond Nuclear	RRR000241 / 0004
	Kamps, Kevin	
	McCabe, Eileen	RRR000929 / 0004
	Mullings, Diamond	RRR000769 / 0009
	Nash, Nora	RRR000931 / 0005
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0038
	Navis, Irene	
	Sisters of St. Joseph of Carondelet	RRR000938 / 0005
	Oleskevich, Diana	
	One Feather, Harold	RRR000937 / 0004

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1.6.3 (74) (continued)	Reback, Mark	RRR000936 / 0004
	Roth, Erik	RRR000930 / 0004
	Shillinglaw, Fawn	RRR000688 / 0017
	Tuler, Seth	RRR000837 / 0004
	Vandenbosch, Robert/Susanne	RRR000232 / 0001
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0009
1.6.3 (1557)	Beyond Nuclear Kamps, Kevin	RRR000325 / 0004
1.6.3.2 (175)	Bonds, Julia	RRR000403 / 0007
	Cecil, Pat	RRR000091 / 0004
	State of Utah Chancellor, Denise	RRR000677 / 0006
	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0008
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000056 / 0003
	Hanson, Art	RRR000612 / 0002
	McGoldrick, Suzanne	RRR000231 / 0001
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0012
	Shillinglaw, Fawn	RRR000688 / 0009
	Slack, Susan	RRR000142 / 0010
	Tuler, Seth	RRR000837 / 0002
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0015
1.6.3.2 (176)	Alley, Charles	RRR000995 / 0021
	Barnell, Todd	RRR000730 / 0004
	Bartholomew, Alice	RRR000529 / 0006
	Timbisha Shoshone Beaman, Ed	RRR000692 / 0008
	Bechtel, Dennis	RRR000981 / 0004
	CSG Midwest Beetem, Jane	RRR000655 / 0004
	Benti, Wynne	RRR000071 / 0006
	Bernard, Larry	RRR000551 / 0005 RRR000728 / 0005
	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0007
	Nuclear Information and Resource Services Binette, Aja	RRR000324 / 0002
	California Energy Commission Boyd, James	RRR000642 / 0016
	State of California, California Energy Commission Byron, Barbara	RRR000108 / 0004
	Castleberry, George	RRR000731 / 0004
	State of Utah Chancellor, Denise	RRR000677 / 0003
	Covington, Cathy	RRR000492 / 0005
	Daggett, Becky	RRR000733 / 0004
	DeMare, Joseph	RRR000595 / 0003
	DePauw, Jolie	RRR000852 / 0004
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000082 / 0005

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1.6.3.2 (176) (continued)	County of Inyo, Yucca Mountain Repository Assessment Office	RRR000239 / 0008
	Gaffney, Matt	
	Grant, Patrick	RRR000741 / 0004
	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0025
	Gray, Charles	
	Greenhaw, Rhonda	RRR000520 / 0006
	Guzman, Tony	RRR000932 / 0003
	State of Nevada, Agency for Nuclear Projects	RRR000321 / 0003
	Hall, Jim	
	Hanson, Art	RRR000467 / 0003
	Hanson, Natalie	RRR000468 / 0003
	Harden, Cory/Martha	RRR000404 / 0005
	Haymaker, Annie	RRR000506 / 0003
	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk	RRR000933 / 0003
	Heinonen, Valerie	
	Holzberg, Steve	RRR000491 / 0006
	Illegible	RRR000573 / 0004
	Karpen, Leah	RRR000578 / 0001
	Timbisha Shoshone	RRR000690 / 0010
	Kennedy, Joe	
	Esmeralda County, Board of County Commissioners	RRR000666 / 0001
	Kirby, William	
	Lim, Kingman	RRR000373 / 0002
	Lincoln, Robert	RRR000552 / 0005
	Linda, Deb	RRR000577 / 0007
	Linda, Tom	RRR000732 / 0004
	Mareck, Katherine	RRR000571 / 0004
	Marsh, Amy	RRR000560 / 0004
	McCabe, Eileen	RRR000929 / 0003
	Alliance for Nuclear Accountability	RRR000330 / 0002
	Meyer, Alfred	
		RRR000726 / 0006
	Big Pine Paiute Tribe of the Owens Valley	RRR000675 / 0027
	Moose, Virgil	
	Mullings, Diamond	RRR000769 / 0006
	Nash, Nora	RRR000931 / 0003
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0016
	Navis, Irene	
	Sisters of St. Joseph of Carondelet	RRR000938 / 0003
	Oleskevich, Diana	
	One Feather, Harold	RRR000937 / 0003
	Pringle, Bruce	RRR000484 / 0005
	Reback, Mark	RRR000936 / 0003
	Congress of the United States	RRR000290 / 0004
	Reid, Harry	
		RRR000678 / 0003
	Roth, Erik	RRR000930 / 0003
	Rouvier, Julia	RRR000570 / 0004
	Sanford, Warren	RRR000575 / 0004
	City of Henderson	RRR000269 / 0002
	Schroder, Gerri	

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1.6.3.2 (176) (continued)	Scurlock, Rodger	RRR000764 / 0004
	Seely, Clover	RRR000913 / 0006
	Siegel, Larry	RRR000631 / 0008
	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0010
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0006
	von Ranson, Jonathan	RRR000923 / 0001
	Zwicker, Marie Louise	RRR000549 / 0005
1.6.3.2 (1457)	State of New Jersey, Dept. of Environmental Protection Koschek, Kenneth	RRR000567 / 0001
1.6.3.2 (1556)	Beyond Nuclear Kamps, Kevin	RRR000325 / 0003
1.6.3.2 (1640)	Chelette, Iona	RRR000550 / 0016
1.6.3.2 (1744)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0009
1.6.3.2 (1792)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0006
1.6.3.2 (1823)	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0004
1.6.3.2 (1865)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0008
1.6.3.2 (2600)	Beyond Nuclear Kamps, Kevin	RRR000241 / 0003
1.6.3.2 (2658)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0006
1.6.3.2 (2680)	Shillinglaw, Fawn	RRR000688 / 0075
1.6.3.2 (2826)	Shillinglaw, Fawn	RRR000688 / 0041
1.6.3.2 (2947)	Shillinglaw, Fawn	RRR000688 / 0011
1.6.3.2 (2948)	Shillinglaw, Fawn	RRR000688 / 0010
1.6.3.2 (3338)	Kirby, William	RRR000235 / 0001
1.6.3.3 (2333)	Shillinglaw, Fawn	RRR000688 / 0060
1.6.3.3 (2903)	Shillinglaw, Fawn	RRR000688 / 0019
1.6.3.3 (2942)	Shillinglaw, Fawn	RRR000688 / 0016
1.6.3.3 (2944)	Shillinglaw, Fawn	RRR000688 / 0015
1.6.3.3 (2953)	Shillinglaw, Fawn	RRR000688 / 0005
1.6.3.3 (3619)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0007
1.6.3.3 (3620)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0009
1.6.3.3 (4033)	Alley, Charles	RRR000995 / 0014
1.6.5 (45)	Shillinglaw, Fawn	RRR000688 / 0003
	Treadway, Carolyn	RRR000445 / 0002 RRR000583 / 0003
1.6.5 (56)	State of California, California Energy Commission Byron, Barbara	RRR000108 / 0008
	Gagnon, Lisa	RRR000540 / 0005
	Gaia, Fabiana	RRR000337 / 0002
	HOME – Healing Ourselves and Mother Earth Hadder, John	RRR000046 / 0005
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0011

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1.6.5 (57)	Benti, Wynne	RRR000071 / 0007
	Evans, Jim	RRR000296 / 0001
	Givens, Nancy	RRR000479 / 0002
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0012
1.6.5 (58)	Anonymous	RRR000841 / 0001
	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0026
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0011
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0014
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0006
	Shillinglaw, Fawn	RRR000688 / 0027
	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0002
1.6.5 (2832)	Shillinglaw, Fawn	RRR000688 / 0038
1.6.5 (2902)	Shillinglaw, Fawn	RRR000688 / 0020
1.7 (1858)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0002
1.7.1 (1404)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0028
1.7.1 (1416)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0029
1.7.1 (1451)	Kuehnhackl, Krista	RRR000867 / 0007
1.7.1 (1577)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0040 RRR000691 / 0076
1.7.1 (1683)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0014
1.7.1 (1767)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0014
1.7.1 (3981)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0024
1.7.1 (4043)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0062
1.7.1 (4044)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0063
1.7.2 (1616)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0012
1.7.2 (2456)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0039
1.7.2 (2884)	Shillinglaw, Fawn	RRR000688 / 0036
1.7.2 (3042)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0046
1.7.2 (4141)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0025
1.7.3 (172)	Bonds, Julia	RRR000403 / 0002
	Gagnon, Lisa	RRR000540 / 0006
	Hanson, Art	RRR000467 / 0001
	Hanson, Natalie	RRR000468 / 0001
	Marsh, Amy	RRR000560 / 0003

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1.7.3 (172) (continued)	McCabe, Eileen	RRR000929 / 0005
	Miller, Mark	RRR000729 / 0002
	Rigby, Samantha	RRR000881 / 0001
	Tieri, Anna	RRR001054 / 0001
	Wood, Lea	RRR000714 / 0001
	Zolkover, Adrian	RRR000025 / 0003
1.7.3 (479)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0014
1.7.3 (482)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0015
1.7.3 (483)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0016
1.7.3 (484)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0017
1.7.3 (2744)	Shillinglaw, Fawn	RRR000688 / 0068
1.7.3 (2804)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0005
1.7.3 (3038)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0007
1.7.3 (3606)	Slack, Susan	RRR000142 / 0006
1.7.3 (4199)	Shahrooz, William	RRR000286 / 0001
	Woods, Stanford	RRR000258 / 0001
1.7.4 (89)	Anonymous	RRR000425 / 0004
	Barnell, Todd	RRR000730 / 0002
	Bartholomew, Alice	RRR000529 / 0005
	Bernard, Larry	RRR000551 / 0004 RRR000728 / 0004
	Bodde, Mary	RRR000497 / 0004
	Bonds, Julia	RRR000403 / 0006
	Castleberry, George	RRR000731 / 0002
	Covington, Cathy	RRR000492 / 0004
	Daggett, Becky	RRR000733 / 0002
	DePauw, Jolie	RRR000852 / 0003
	Devine, Don	RRR000459 / 0003
	Farias, Corinne	RRR000424 / 0004
	Gagnon, Lisa	RRR000540 / 0002
	Grant, Patrick	RRR000741 / 0002
	Greenhaw, Rhonda	RRR000520 / 0005
	Harden, Cory/Martha	RRR000404 / 0004
	Haymaker, Annie	RRR000506 / 0002
	Holzberg, Steve	RRR000491 / 0005
	Illegible	RRR000573 / 0002
	Irwin, Larry	RRR000478 / 0004
	Lincoln, Robert	RRR000552 / 0004
	Linda, Deb	RRR000577 / 0005
	Linda, Tom	RRR000732 / 0002
	Mahoney, Stephen	RRR000469 / 0001
	Mareck, Katherine	RRR000571 / 0002
	Miller, Mark	RRR000729 / 0003
	Pringle, Bruce	RRR000484 / 0003
	Quiroz, Mike	RRR000535 / 0002
	Southwest Worker's Union Rendon, Genaro	RRR000749 / 0002

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1.7.4 (89) (continued)	Rouvier, Julia	RRR000570 / 0002
	Sanford, Warren	RRR000575 / 0002
	Scurlock, Rodger	RRR000764 / 0002
	Seely, Clover	RRR000913 / 0005
	Siegel, Larry	RRR000631 / 0007
	Solomon, Laurie	RRR000721 / 0002
		RRR000934 / 0002
1.7.4 (150)	Regional Association of Concerned Environmentalists (RACE)	RRR000935 / 0004
	Donham, Mark	
	Guzman, Tony	RRR000932 / 0005
	Mercy Investment Program, Sisters of Mercy-Detroit,	RRR000933 / 0006
	Dominican Sisters of Hope and Ursuline Sisters of Tildonk	
	Heinonen, Valerie	
	Nash, Nora	RRR000931 / 0006
	Sisters of St. Joseph of Carondelet	RRR000938 / 0006
	Oleskevich, Diana	
	One Feather, Harold	RRR000937 / 0006
	Reback, Mark	RRR000936 / 0006
	Roth, Erik	RRR000930 / 0006
1.7.4 (325)	Cecil, Pat	RRR000091 / 0002
1.7.4 (396)	HOME – Healing Ourselves and Mother Earth	RRR000061 / 0002
	Viereck, Jennifer	
1.7.4 (485)	Inyo County, Board of Supervisors	RRR000396 / 0018
	Bilyeu, Jim	
1.7.4 (486)	Inyo County, Board of Supervisors	RRR000396 / 0019
	Bilyeu, Jim	
1.7.4 (487)	Inyo County, Board of Supervisors	RRR000396 / 0020
	Bilyeu, Jim	
1.7.4 (488)	Inyo County, Board of Supervisors	RRR000396 / 0021
	Bilyeu, Jim	
1.7.4 (489)	Inyo County, Board of Supervisors	RRR000396 / 0022
	Bilyeu, Jim	
1.7.4 (492)	Inyo County, Board of Supervisors	RRR000396 / 0023
	Bilyeu, Jim	
1.7.4 (493)	Inyo County, Board of Supervisors	RRR000396 / 0024
	Bilyeu, Jim	
1.7.4 (494)	Inyo County, Board of Supervisors	RRR000396 / 0025
	Bilyeu, Jim	
1.7.4 (532)	State of California, California Energy Commission	RRR000108 / 0006
	Byron, Barbara	
1.7.4 (1614)	Timbisha Shoshone	RRR000690 / 0013
	Kennedy, Joe	
1.7.4 (1874)	State of Utah	RRR000677 / 0017
	Chancellor, Denise	
1.7.4 (2360)	State of Caifornia, Dept. of Fish and Game	RRR001078 / 0002
	Racime, Denyse	
1.7.4 (2365)	Timbisha Shoshone	RRR000692 / 0005
	Beaman, Ed	
1.7.4 (2450)	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0035
	Navis, Irene	
1.7.4 (2746)	Shillinglaw, Fawn	RRR000688 / 0066
1.7.4 (2747)	Shillinglaw, Fawn	RRR000688 / 0065
1.7.4 (2753)	Shillinglaw, Fawn	RRR000688 / 0058

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1.7.4 (2846)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0006
1.7.4 (2850)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0007
1.7.4 (2894)	Shillinglaw, Fawn	RRR000688 / 0028
1.7.4 (3608)	Slack, Susan	RRR000142 / 0008
1.7.4 (3708)	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000082 / 0001
1.7.4 (3749)	California Energy Commission Boyd, James	RRR000642 / 0021
1.7.4 (3756)	McCabe, Eileen	RRR000929 / 0009
1.7.4 (3959)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0002
1.7.4 (4050)	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000092 / 0002
1.7.4 (4059)	Zwicker, Marie Louise	RRR000549 / 0003
1.7.4 (4061)	Sheldon-Scurlock, Peggy	RRR000572 / 0002
1.7.4 (4062)	Sheldon-Scurlock, Peggy	RRR000572 / 0004
1.7.4 (4064)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0016
1.7.4 (4188)	Timbisha Shoshone Beaman, Ed	RRR000692 / 0003
	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0001
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000059 / 0001
	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0001
	Mullings, Diamond	RRR000769 / 0001
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0001
1.7.4 (4189)	Timbisha Shoshone Beaman, Ed	RRR000692 / 0004
	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0002
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000059 / 0002
	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0002
	Mullings, Diamond	RRR000769 / 0002
	Slack, Susan	RRR000142 / 0007
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0002
1.7.4 (4195)	Durham, Barbara	RRR000067 / 0002
	Owens Valley Indian Commission Heil, Darla	RRR000100 / 0003
1.7.4 (4197)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0035
		RRR000691 / 0071
	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0022

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1.7.5 (157)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0014 RRR000691 / 0035
	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0025
1.7.5 (1576)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0041 RRR000691 / 0077
1.7.5 (2331)	State of Caifornia, Dept. of Fish and Game Racime, Denyse	RRR001078 / 0001
1.7.5 (3191)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0016
1.7.5 (3414)	U.S. Department of the Interior, Bureau of Land Management Palma, Juan	RRR001081 / 0002
1.7.5 (4079)	Alley, Charles	RRR000995 / 0018
1.7.6 (477)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0012
1.7.6 (590)	Native American Heritage Commission Singleton, Dave	RRR000032 / 0001
1.7.6 (1587)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0030 RRR000691 / 0066
1.7.6 (1605)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0020
1.7.6 (1606)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0019
1.7.6 (1685)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0005
1.7.6 (2491)	Western Shoshone Defense Project Bill, Larson	RRR000686 / 0004
1.7.6 (3149)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0012
1.7.6 (3539)	McCabe, Eileen	RRR000929 / 0008
1.7.6 (4039)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0058
1.7.6 (4086)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0070
1.7.6 (4086) (continued)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0010
1.7.6 (4090)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0074
1.7.6 (4122)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0002
1.7.6 (4142)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0026
1.7.6 (4178)	Abbott, Leal	RRR000636 / 0001
	Batterden, James	RRR000804 / 0002
	Beckwith, Nan	RRR000772 / 0002
	Berry, Michael	RRR000805 / 0002
	Bonds, Julia	RRR000403 / 0001
	Curran, John	RRR000801 / 0002
	Damaschke, Jon	RRR000803 / 0002
	Flores, Gabriel/Raven	RRR000811 / 0002
	Fofrich, Robert	RRR000802 / 0002

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1.7.6 (4178) (continued)	Greene, Eileen	RRR000994 / 0004
	Griffith, Donna	RRR000633 / 0001
	Hanson, Art	RRR000467 / 0002
	Hanson, Natalie	RRR000468 / 0002
	McWhite, Nancy	RRR000808 / 0002
	Mejia, Sergio	RRR000807 / 0002
	Miranda, Daniel	RRR000397 / 0001
	Moncada, Patricia	RRR000888 / 0001
	Naha, Cynthia	RRR000485 / 0001
	Naranjo, Marian	RRR000810 / 0002
	Rytinova, Zdenka	RRR000806 / 0002
	Southern Ohio Neighbors Group Sea, Geoffrey	RRR000887 / 0001
	Teale, Laulani	RRR000594 / 0002
	Tronto, Marlise	RRR000407 / 0001
	Remnant Yuchi Nation Vest, Lee	RRR000383 / 0002
	Wastewin, Wambdi	RRR000632 / 0001
	West, Cat	RRR000364 / 0001
1.7.6 (4179)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0011
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0011
1.7.7 (616)	Sampson, Irene	RRR000124 / 0004
1.7.7 (626)	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000059 / 0005
	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0009
1.7.7 (1453)	Kuehnhackl, Krista	RRR000867 / 0009
1.7.7 (1586)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0031 RRR000691 / 0067
1.7.7 (1612)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0015
1.7.7 (1633)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0015
1.7.7 (1659)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0012
1.7.7 (1660)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0011
1.7.7 (1691)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0008
1.7.7 (1694)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0004
1.7.7 (1793)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0001
1.7.7 (1798)	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0008
1.7.7 (1904)	State of Utah Chancellor, Denise	RRR000677 / 0015
1.7.7 (2149)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0018

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1.7.7 (2151)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0017
1.7.7 (2152)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0016
1.7.7 (2341)	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0010
1.7.7 (2709)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0021
1.7.7 (2735)	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0003
1.7.7 (3039)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0008
1.7.7 (3129)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0032
1.7.7 (3371)	Brown, Shiela	RRR001011 / 0001
1.7.7 (3590)	Californians for Safe, Clean, Efficient Nuclear Power Walker, Daniel	RRR000176 / 0007
1.7.7 (3629)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0020
1.7.7 (3724)	Greene, Eileen	RRR000994 / 0001
1.7.7 (4048)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0067
1.7.7 (4049)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0068
1.7.7 (4140)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0024
1.7.7 (4230)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0004
	California Energy Commission Boyd, James	RRR000642 / 0026
	State of California, California Energy Commission Byron, Barbara	RRR000108 / 0007
	Cecil, Pat	RRR000091 / 0001
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000059 / 0004
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000082 / 0003
1.7.7 (4230) (continued)	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0004
	Owens Valley Indian Commission Heil, Darla	RRR000100 / 0002
	Mullings, Diamond	RRR000769 / 0003
1.7.7 (4231)	Timbisha Shoshone Beaman, Ed	RRR000692 / 0006
	Cravens, Marisa	RRR000650 / 0002
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0004
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0006
	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0023
1.7.7 (4232)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0009

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1.7.8 (268)	Alliance for Nuclear Accountability Meyer, Alfred	RRR000330 / 0003
1.7.8 (326)	Rothgal, John	RRR000095 / 0001
1.7.8 (410)	Physicians for Social Responsibility Parillo, Jill	RRR000329 / 0003
1.7.8 (412)	Physicians for Social Responsibility Parillo, Jill	RRR000329 / 0005
1.7.8 (918)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0010
1.7.8 (942)	Center for Disease Control and Prevention, Dept. of Health and Human Services Dannenberg, Andrew	RRR000454 / 0001
1.7.8 (965)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0019
1.7.8 (1482)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0018
1.7.8 (1574)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0043 RRR000691 / 0079
1.7.8 (1610)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0016
1.7.8 (1690)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0010
1.7.8 (1757)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0044
1.7.8 (1796)	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0010
1.7.8 (1810)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0004
1.7.8 (1814)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0034
1.7.8 (1816)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0033
1.7.8 (1887)	Givens, Nancy	RRR000479 / 0004
1.7.8 (1899)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0014
1.7.8 (1905)	State of Utah Chancellor, Denise	RRR000677 / 0014
1.7.8 (1923)	Physicians for Social Responsibility McCally, Michael	RRR000861 / 0006
1.7.8 (1948)	Physicians for Social Responsibility McCally, Michael	RRR000861 / 0004
1.7.8 (2131)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0020
1.7.8 (2146)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0019
1.7.8 (2321)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0011
1.7.8 (2604)	Beyond Nuclear Kamps, Kevin	RRR000241 / 0007
1.7.8 (2892)	Shillinglaw, Fawn	RRR000688 / 0030
1.7.8 (2893)	Shillinglaw, Fawn	RRR000688 / 0029
1.7.8 (2945)	Shillinglaw, Fawn	RRR000688 / 0014

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1.7.8 (2951)	Shillinglaw, Fawn	RRR000688 / 0007
1.7.8 (3041)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0045
1.7.8 (3043)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0047
1.7.8 (3126)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0029
1.7.8 (3200)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0020
1.7.8 (3543)	McCabe, Eileen	RRR000929 / 0010
1.7.8 (3602)	Slack, Susan	RRR000142 / 0002
1.7.8 (3609)	Slack, Susan	RRR000142 / 0009
1.7.8 (3680)	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk Heinonen, Valerie	RRR000933 / 0007
	Sisters of St. Joseph of Carondelet Oleskevich, Diana	RRR000938 / 0007
	One Feather, Harold	RRR000937 / 0007
	Reback, Mark	RRR000936 / 0007
	Roth, Erik	RRR000930 / 0007
1.7.8 (3793)	Regional Association of Concerned Environmentalists (RACE) Donham, Mark	RRR000935 / 0005
1.7.8 (3936)	Shaw, Gary	RRR000953 / 0001
1.7.8 (4097)	Tuler, Seth	RRR000837 / 0005
1.7.9 (2685)	Shillinglaw, Fawn	RRR000688 / 0070
1.7.10 (1618)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0011
1.7.11 (1450)	Kuehnhackl, Krista	RRR000867 / 0006
1.7.11 (1452)	Kuehnhackl, Krista	RRR000867 / 0008
1.7.11 (1609)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0017
1.7.11 (1873)	State of Utah Chancellor, Denise	RRR000677 / 0018
1.7.11 (1903)	State of Utah Chancellor, Denise	RRR000677 / 0016
1.7.11 (2684)	Shillinglaw, Fawn	RRR000688 / 0071
1.7.12 (134)	Mullings, Diamond	RRR000769 / 0007
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0007
1.7.12 (922)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0013
1.7.12 (1446)	Kuehnhackl, Krista	RRR000867 / 0002
1.7.12 (1447)	Kuehnhackl, Krista	RRR000867 / 0003
1.7.12 (1608)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0018
1.7.12 (1637)	Chelette, Iona	RRR000550 / 0013
1.7.12 (1751)	Chelette, Iona	RRR000550 / 0006
1.7.12 (1933)	State of Utah Chancellor, Denise	RRR000677 / 0011
1.7.12 (4010)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0006
1.7.13 (171)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0069
	Chelette, Iona	RRR000550 / 0012

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1.7.13 (171) (continued)	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000082 / 0006
	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0021
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0013
	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0033
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0019
	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0007
1.7.13 (2145)	Chelette, Iona	RRR000550 / 0002
1.7.13 (4012)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0007
1.7.14 (949)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0017
1.7.14 (971)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0025
1.7.14 (981)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0021
1.7.14 (1250)	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0004
1.7.14 (1253)	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0007
1.7.14 (1569)	Karpen, Leah	RRR000578 / 0002
	Metz, Marc	RRR000799 / 0002
1.7.14 (1725)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0009
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0006
1.7.14 (1870)	State of Utah Chancellor, Denise	RRR000677 / 0021
1.7.14 (1986)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0028
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0021
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0066
1.7.14 (1997)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0016
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0012
1.7.14 (2032)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0005
1.7.14 (2074)	City of Reno Cashell, Robert	RRR000680 / 0010
1.7.14 (2164)	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0007
1.7.14 (2239)	Grover, Ravi	RRR000607 / 0001
1.7.14 (2282)	Mullings, Diamond	RRR000769 / 0014
1.7.14 (2371)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0028

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1.7.14 (2461)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0035
1.7.14 (2710)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0049
1.7.14 (2839)	Gagnon, Lisa	RRR000540 / 0003
1.7.14 (2859)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0014
1.7.14 (2939)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0015
1.7.14 (3032)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0020
1.7.14 (3056)	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0005
1.7.14 (3616)	California Energy Commission Boyd, James	RRR000642 / 0010
1.7.14 (3661)	California Energy Commission Boyd, James	RRR000642 / 0011
1.7.14 (3662)	California Energy Commission Boyd, James	RRR000642 / 0012
1.7.14 (4183)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0054
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0047
1.7.14 (4192)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0004
	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0004
	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0015
	Durham, Barbara	RRR000067 / 0001
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0011
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0004
	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0015
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0007
	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0012
1.7.14 (4198)	Alliance for Nuclear Responsibility Becker, Rochelle	RRR000603 / 0008
	Chelette, Iona	RRR000550 / 0001
	State of Nevada, Agency for Nuclear Projects Hall, Jim	RRR000321 / 0004
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0004
		RRR000013 / 0009
		RRR000038 / 0007
	Huston/Cole, John/Jan	RRR000317 / 0015
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0036
		RRR000663 / 0018
1.7.14 (4198)	County of San Bernardino, Board of Supervisors	RRR000673 / 0004

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(continued)	Mitzelfelt, Brad	
	Congress of the United States	RRR000678 / 0012
	Reid, Harry	
	Shillinglaw, Fawn	RRR000688 / 0002
	State of California, Dept. of Justice	RRR000659 / 0003
	Sullivan, Timothy	
	HOME – Healing Ourselves and Mother Earth	RRR000712 / 0014
	Viereck, Jennifer	
	Nuclear Waste Strategy Coalition – NWSC	RRR000117 / 0003
	Wright, David	
1.7.14.1 (992)	State of Nevada, Agency for Nuclear Projects	RRR000662 / 0033
	Loux, Robert	
1.7.14.1 (2742)	Western Interstate Energy Board – WIEB	RRR000661 / 0010
	Williams, Jim	
1.7.14.1 (2773)	Churchill County Commissioners	RRR000523 / 0009
	Washburn, Gwen	
1.7.14.1 (2794)	Commonwealth of Virginia, Dept. of Environmental Quality	RRR000679 / 0001
	Irons, Ellie	
1.7.14.1 (2799)	Lewis, Marvin	RRR000538 / 0001
1.7.14.1 (2961)	CSG Midwest	RRR000655 / 0007
	Beetem, Jane	
1.7.14.1 (2962)	CSG Midwest	RRR000655 / 0006
	Beetem, Jane	
1.7.14.1 (3008)	CSG Midwest	RRR000655 / 0005
	Beetem, Jane	
1.7.14.1 (3048)	White Pine Nuclear Waste Project Office	RRR000522 / 0002
	Simon, Mike	
1.7.14.1 (3348)	California Energy Commission	RRR000642 / 0008
	Boyd, James	
1.7.14.1 (3615)	California Energy Commission	RRR000642 / 0009
	Boyd, James	
1.7.14.1 (3706)	California Energy Commission	RRR000642 / 0017
	Boyd, James	
1.7.14.1 (3744)	California Energy Commission	RRR000642 / 0018
	Boyd, James	
1.7.14.1 (3746)	California Energy Commission	RRR000642 / 0019
	Boyd, James	
1.7.14.1 (3747)	California Energy Commission	RRR000642 / 0020
	Boyd, James	
1.7.14.2 (1046)	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0027
	Loux, Robert	
1.7.14.2 (1432)	Nye County, Board of County Commissioners	RRR000656 / 0033
	Eastley, Joni	
1.7.14.2 (2034)	Lander County, Board of Commissioners	RRR000646 / 0007
	Chapin, Chuck	
	Mineral County, Board of Commissioners	RRR000682 / 0003
	Fowler, Ed	
1.7.14.2 (2072)	City of Reno	RRR000680 / 0009
	Cashell, Robert	
1.7.14.2 (3988)	Cole, Jan	RRR000014 / 0004
1.7.14.2 (4098)	Omuhundro, Charlotte	RRR000175 / 0003

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1.7.14.2 (4162)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0006
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0002
1.7.14.2 (4180)	City of Reno Cashell, Robert	RRR000680 / 0007
1.7.15 (411)	Physicians for Social Responsibility Parillo, Jill	RRR000329 / 0004
1.7.15 (606)	Huston, John	RRR000015 / 0004
1.7.15 (917)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0009
1.7.15 (1454)	Kuehnhackl, Krista	RRR000867 / 0010
1.7.15 (1575)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0042 RRR000691 / 0078
1.7.15 (1581)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0036 RRR000691 / 0072
1.7.15 (1593)	Beyond Nuclear Kamps, Kevin	RRR000325 / 0005
1.7.15 (1681)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0016
1.7.15 (1682)	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0015
1.7.15 (1766)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0022
1.7.15 (1924)	Physicians for Social Responsibility McCally, Michael	RRR000861 / 0005
1.7.15 (1936)	State of Utah Chancellor, Denise	RRR000677 / 0008
1.7.15 (1937)	State of Utah Chancellor, Denise	RRR000677 / 0007
1.7.15 (2129)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0021
1.7.15 (2278)	Mullings, Diamond	RRR000769 / 0010
1.7.15 (2677)	Shillinglaw, Fawn	RRR000688 / 0077
1.7.15 (2807)	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0010
1.7.15 (2885)	Shillinglaw, Fawn	RRR000688 / 0035
1.7.15 (2888)	Shillinglaw, Fawn	RRR000688 / 0034
1.7.15 (2890)	Shillinglaw, Fawn	RRR000688 / 0032
1.7.15 (3040)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0009
1.7.15 (3084)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0010
1.7.15 (3195)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0017
1.7.15 (3738)	Huston/Cole, John/Jan	RRR000317 / 0011
1.7.15 (3785)	Zwicker, Marie Louise	RRR000549 / 0006
1.7.15 (3907)	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0006
1.7.15 (3993)	Benti, Wynne	RRR000071 / 0004
1.7.15 (3994)	Cecil, Pat	RRR000091 / 0005

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1.7.15 (4054)	Freeman, Fred	RRR000212 / 0002
1.7.15 (4056)	Clark County Brager, Susan	RRR000270 / 0002
1.7.15 (4058)	Givens, Nancy	RRR000479 / 0007
1.7.15 (4143)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0027
1.7.15 (4214)	Cuzze, Donna	RRR001086 / 0001
1.7.16 (619)	Zolkover, Adrian	RRR000025 / 0004
1.7.16 (623)	Zolkover, Adrian	RRR000025 / 0008
1.7.16 (1689)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0009
1.7.16 (2163)	State of California, Dept. of Justice Sullivan, Timothy	RRR000659 / 0006
1.7.16 (2367)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0024
1.7.16 (2828)	Shillinglaw, Fawn	RRR000688 / 0040
1.7.16 (2946)	Shillinglaw, Fawn	RRR000688 / 0012
1.7.16 (3470)	McCabe, Eileen	RRR000929 / 0006
1.7.16 (4233)	Banks, Elizabeth	RRR000765 / 0002
	Barnell, Todd	RRR000730 / 0008
	Barnes, Kathryn	RRR000562 / 0005
	Bartholomew, Alice	RRR000529 / 0010
	Bechtel, Dennis	RRR000305 / 0004
		RRR000981 / 0008
	Bonds, Julia	RRR000403 / 0012
	Bourgoin, Ron	RRR000140 / 0001
	Castleberry, George	RRR000731 / 0008
	Covington, Cathy	RRR000492 / 0009
	Daggett, Becky	RRR000733 / 0008
	Grant, Patrick	RRR000741 / 0008
	Greenhaw, Rhonda	RRR000520 / 0011
	Harden, Cory/Martha	RRR000404 / 0010
	Haymaker, Annie	RRR000506 / 0008
	Hellman, Codie	RRR000139 / 0002
	Holzberg, Steve	RRR000491 / 0010
	Hornbeck Law Office Hornbeck, David	RRR000192 / 0002
	Hudig, Dorothy	RRR000145 / 0002
		RRR000307 / 0002
	Illegible	RRR000573 / 0008
	Lewis, Marvin	RRR000538 / 0002
	Linda, Deb	RRR000577 / 0011
	Linda, Tom	RRR000732 / 0008
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000662 / 0016
		RRR000663 / 0020
	Mareck, Katherine	RRR000571 / 0008
	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0011
	Rana, Avis	RRR000719 / 0003
	Rivers, Victoria	RRR000948 / 0001
	Rouvier, Julia	RRR000570 / 0008
	Sampson, Irene	RRR000124 / 0002

Comment-Response Document Location	Commenter	Comment Document / Comment Number
1.7.16 (4233) (continued)	Sanford, Warren	RRR000575 / 0008
	Scurlock, Rodger	RRR000764 / 0008
	Seely, Clover	RRR000913 / 0011
	Sheldon-Scurlock, Peggy	RRR000572 / 0006
	Shillinglaw, Fawn	RRR000688 / 0031
	Siegel, Larry	RRR000631 / 0012
	Slack, Susan	RRR000142 / 0003
	Ward, Dick/Korla	RRR000028 / 0002
	Zwicker, Marie Louise	RRR000549 / 0007
1.7.16 (4234)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0010
	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0015
	Nuclear Energy Institute – NEI McCullum, Rodney	RRR000620 / 0008
1.7.17 (2760)	Shillinglaw, Fawn	RRR000688 / 0051
1.7.17 (4145)	State of Utah Chancellor, Denise	RRR000677 / 0023
1.7.18 (450)	Western Shoshone National Council Zabarte, Ian	RRR000327 / 0001
		RRR000347 / 0001
1.7.18 (456)	Western Shoshone National Council Zabarte, Ian	RRR000276 / 0001
1.7.18 (630)	Las Vegas Indian Center Reed, Debra	RRR000283 / 0001
1.7.18 (676)	Albert, Georgia	RRR000438 / 0001
1.7.18 (1585)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0032
		RRR000691 / 0068
1.7.18 (1588)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0029
		RRR000691 / 0065
1.7.18 (1590)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0027
		RRR000691 / 0063
1.7.18 (1599)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0024
1.7.18 (3968)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0008
1.7.18 (4042)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0061
1.7.18 (4125)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0003
1.7.18.1 (1621)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0009
1.7.18.1 (1624)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0006
		RRR000691 / 0006
1.7.18.1 (2229)	Markey, Darlene	RRR000623 / 0001
1.7.18.1 (2272)	Mullings, Diamond	RRR000769 / 0004
1.7.18.1 (2674)	Timbisha Shoshone Beaman, Ed	RRR000692 / 0012

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1.7.18.1 (2855)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0009
1.7.18.1 (3101)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0008
1.7.18.1 (3102)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0009
1.7.18.1 (4046)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0065
1.7.18.1 (4127)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0004
1.7.18.2 (332)	Owens Valley Indian Commission Heil, Darla	RRR000100 / 0005
1.7.18.2 (633)	Las Vegas Indian Center Reed, Debra	RRR000283 / 0004
1.7.18.2 (1520)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0001 RRR000691 / 0001
1.7.18.2 (1580)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0037 RRR000691 / 0073
1.7.18.2 (1584)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0033 RRR000691 / 0069
1.7.18.2 (1589)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0028 RRR000691 / 0064
1.7.18.2 (1591)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0026 RRR000691 / 0062
1.7.18.2 (1625)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0005 RRR000691 / 0005
1.7.18.2 (2725)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0001
1.7.18.2 (2854)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0008
1.7.18.2 (3096)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0006
1.7.18.2 (3197)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0019
1.7.18.2 (4038)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0057
1.7.18.2 (4040)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0059
1.7.18.2 (4045)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0064
1.7.18.2 (4053)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0017
1.7.18.2 (4078)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0001
1.7.18.2 (4091)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0075
1.8.1 (33)	Barnes, Kathryn Booe, Kenneth	RRR000562 / 0006 RRR000968 / 0002

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1.8.1 (33) (continued)	Brown, Richard	RRR000024 / 0004
	Chelette, Iona	RRR000550 / 0014
	DeKlever, Richard	RRR000223 / 0003
		RRR000315 / 0002
	Eureka County Board of Commissioners	RRR000664 / 0042
	Ithurralde, James	
	Kuehnhackl, Krista	RRR000867 / 0011
	Lim, Kingman	RRR000373 / 0004
	Nuclear Energy Institute – NEI	RRR000620 / 0005
	McCullum, Rodney	
	Meadow, Norman	RRR000866 / 0001
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0012
	Navis, Irene	
	Payer, Tax	RRR000188 / 0002
	Sandness, Robert	RRR000313 / 0003
	Shillinglaw, Fawn	RRR000688 / 0008
1.9 (75)	Anonymous	RRR000425 / 0003
	Bartholomew, Alice	RRR000529 / 0004
	Bodde, Mary	RRR000497 / 0003
	Bonds, Julia	RRR000403 / 0005
	Covington, Cathy	RRR000492 / 0003
	Farias, Corinne	RRR000424 / 0003
	Greenhaw, Rhonda	RRR000520 / 0004
	Harden, Cory/Martha	RRR000404 / 0003
	Holzberg, Steve	RRR000491 / 0004
	Irwin, Larry	RRR000478 / 0003
	Lincoln, Robert	RRR000552 / 0003
	Alliance for Nuclear Accountability	RRR000726 / 0002
	Meyer, Alfred	
	Miller, Mark	RRR000729 / 0004
	Seely, Clover	RRR000913 / 0004
	Siegel, Larry	RRR000631 / 0006
1.9 (76)	Institute for Energy and Environmental Research	RRR000676 / 0001
	Chalmers, Lois	
	Shillinglaw, Fawn	RRR000688 / 0050
1.9 (77)	Nye County, Board of County Commissioners	RRR000657 / 0009
	Eastley, Joni	
	U.S. Department of the Interior, Bureau of Land Management	RRR001081 / 0001
	Palma, Juan	
1.9 (97)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0007
	Hornbeck, Ronda	
	White Pine Nuclear Waste Project Office	RRR000522 / 0007
	Simon, Mike	
1.9 (263)	Environment America	RRR000328 / 0002
	Linder, Josh	
1.9 (409)	Physicians for Social Responsibility	RRR000329 / 0002
	Parillo, Jill	
1.9 (426)	Congress of the United States	RRR000290 / 0005
	Reid, Harry	
1.9 (909)	United States Environmental Protection Agency	RRR000667 / 0002
	Miller, Anne	
1.9 (1561)	Beyond Nuclear	RRR000325 / 0009
	Kamps, Kevin	

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1.9 (1763)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0028
1.9 (1824)	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0003
1.9 (2714)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0050
1.9 (3125)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0028
1.9 (3127)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0030
1.9 (3132)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0014
1.9 (3214)	Anonymous	RRR000841 / 0003
1.9 (3451)	Nelson, Dennis	RRR000820 / 0003
1.9 (3479)	Vandenbosch, Robert/Susanne	RRR000232 / 0004
1.9 (3481)	Vandenbosch, Robert/Susanne	RRR000232 / 0006
1.9 (3482)	Vandenbosch, Robert/Susanne	RRR000232 / 0007
1.9 (3826)	Anonymous	RRR000841 / 0002
1.9 (4107)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0023
1.9 (4135)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0022
1.11 (416)	Benti, Wynne	RRR000071 / 0008
1.11 (495)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0026
1.11 (930)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0008
1.11 (1445)	Kuehnhackl, Krista	RRR000867 / 0001
1.11 (1684)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0004
1.11 (1764)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0025
1.11 (1790)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0037
1.11 (1895)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0010
1.11 (1929)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0019
1.11 (2374)	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0012
1.11 (2392)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0046
1.11 (2421)	Western Shoshone Defense Project Bill, Larson	RRR000686 / 0005
1.11 (2452)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0036
1.11 (2453)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0037
1.11 (2766)	Shillinglaw, Fawn	RRR000688 / 0046
1.11 (3006)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0004

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1.11 (3007)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0005
1.11 (3030)	Western Interstate Energy Board – WIEB Williams, Jim	RRR000661 / 0018
1.11 (3037)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0006
1.11 (3148)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0011
1.11 (3694)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0005
1.11 (3703)	California Energy Commission Boyd, James	RRR000642 / 0015
1.11 (3825)	Reuschel, Warren	RRR000851 / 0001
1.11 (3973)	Alley, Charles	RRR000995 / 0006
1.11 (4191)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0010
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0007
1.11 (4191) (continued)	Guzman, Tony	RRR000932 / 0002
	Mercy Investment Program, Sisters of Mercy-Detroit, Dominican Sisters of Hope and Ursuline Sisters of Tildonk Heinonen, Valerie	RRR000933 / 0002
	Beyond Nuclear Kamps, Kevin	RRR000241 / 0002
	Beyond Nuclear Kamps, Kevin	RRR000325 / 0002
	McCabe, Eileen	RRR000929 / 0002
	Nash, Nora	RRR000931 / 0002
	Clark County Nuclear Waste Program Navis, Irene	RRR000280 / 0009
	Sisters of St. Joseph of Carondelet Oleskevich, Diana	RRR000938 / 0002
	One Feather, Harold	RRR000937 / 0002
	Reback, Mark	RRR000936 / 0002
	Roth, Erik	RRR000930 / 0002
	Slack, Susan	RRR000142 / 0011
1.11 (4193)	Alliance for Nuclear Accountability Meyer, Alfred	RRR000726 / 0008
	Mullings, Diamond	RRR000769 / 0008
	HOME – Healing Ourselves and Mother Earth Viereck, Jennifer	RRR000712 / 0008
1.11 (4194)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0011
	Shillinglaw, Fawn	RRR000688 / 0047
1.12 (162)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0008
1.12 (975)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0029
1.12 (976)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0030
1.12 (2533)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0042

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1.12 (2656)	United States Department of Commerce Harm, Christopher	RRR000569 / 0001
1.12 (3151)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0013
1.12 (4187)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0009
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0029
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0049
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0014
1.12.1 (84)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0003
	California Energy Commission Boyd, James	RRR000642 / 0022
	Inyo County, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000059 / 0003
	County of Inyo, Yucca Mountain Repository Assessment Office Gaffney, Matt	RRR000239 / 0003
1.12.1 (496)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0027
1.12.1 (1601)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0023
1.12.1 (1696)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0002
1.12.1 (1780)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0043
1.12.1 (1789)	Nye County, Board of County Commissioners Eastley, Joni	RRR000657 / 0039
1.12.1 (3128)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0031
1.12.1 (3663)	California Energy Commission Boyd, James	RRR000642 / 0013
1.12.1 (4088)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0072
1.12.1 (4105)	Californians for Safe, Clean, Efficient Nuclear Power Walker, Daniel	RRR000176 / 0004
1.12.1 (4210)	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0018
1.12.1 (4217)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0060
1.12.2 (160)	Anonymous	RRR001031 / 0001
	Bailey, W.R.	RRR001013 / 0001
	Booe, Kenneth	RRR000968 / 0003
	Casal, Jan	RRR000951 / 0001
	Martz, Douglas	RRR001024 / 0001
	McClellan, Scott	RRR000030 / 0002
	Mitchell, Delbert	RRR000189 / 0002
	Osborne, Dan	RRR001052 / 0001
	Silverstein, Mark	RRR001007 / 0001
	Thieme, Marilyn	RRR000952 / 0001
1.12.2 (608)	Sampson, Irene	RRR000124 / 0003

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1.12.2 (1578)	Timbisha Shoshone	RRR000690 / 0039
	Kennedy, Joe	
		RRR000691 / 0075
1.13 (28)	Anonymous	RRR001070 / 0001
	Western Shoshone Defense Project	RRR000686 / 0006
	Bill, Larson	
	Dziegiel, Henry	RRR000226 / 0002
	Beyond Nuclear	RRR000325 / 0006
	Kamps, Kevin	
	Keele, Harold	RRR000170 / 0001
	Clark County Nuclear Waste Program	RRR000280 / 0012
	Navis, Irene	
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0002
	Navis, Irene	
	Shillinglaw, Fawn	RRR000688 / 0026
	Siegel, Larry	RRR000631 / 0002
	Snow, Rick	RRR000049 / 0002
1.14 (539)	Chase, Jim	RRR000388 / 0001
1.14 (4190)	Hansen, Jean	RRR000196 / 0001
	Sandness, Robert	RRR000313 / 0001
	Zolkover, Adrian	RRR000025 / 0007
1.15 (4161)	Alley, Charles	RRR000995 / 0023
	Nye County, Board of County Commissioners	RRR000657 / 0042
	Eastley, Joni	
	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0003
	Gray, Charles	
	Klevorick, Phillip	RRR000005 / 0001
	Nuclear Energy Institute – NEI	RRR000620 / 0013
	McCullum, Rodney	
	White Pine Nuclear Waste Project Office	RRR000522 / 0013
	Simon, Mike	
	Vandenbosch, Robert/Susanne	RRR000232 / 0003
	United States Nuclear Regulatory Commission	RRR000524 / 0003
	Weber, Michael	
1.16 (170)	North Carolina, Dept. of Administration	RRR000670 / 0001
	Baggett, Chrys	
	Balogh, Karen	RRR000375 / 0001
	Barnes, Sophie	RRR000472 / 0001
	Bjork, Nancy	RRR000925 / 0001
	Bullock, Mary	RRR000864 / 0001
	Inyo County, Fifth District	RRR000080 / 0001
	Cervantes, Richard	
	State of Nevada, Dept. of Administration	RRR000450 / 0001
	Coulter, Krista	
	Dunn, Kim	RRR000547 / 0001
	O'Neill, Bobbie	RRR000413 / 0001
	Rasche, Roger	RRR000087 / 0001
	County of Lincoln	RRR000019 / 0001
	Rowe, Tommy	
	Walker Lake Working Group	RRR000392 / 0001
	Treharne, Rolanda	
	Turk, Lawrence	RRR000515 / 0001
1.16 (230)	Drew, Robin	RRR000282 / 0001

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2.1 (1033)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0034
2.1 (1132)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0036
2.1.1 (977)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0031
2.1.1 (1406)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0020
2.1.2 (1405)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0019
2.1.2 (1418)	Bartholomew, Alice	RRR000529 / 0012
	Bonds, Julia	RRR000403 / 0014
	Covington, Cathy	RRR000492 / 0011
	Greenhaw, Rhonda	RRR000520 / 0013
	Harden, Cory/Martha	RRR000404 / 0012
	Holzberg, Steve	RRR000491 / 0012
	Irwin, Larry	RRR000478 / 0005
	Seely, Clover	RRR000913 / 0013
	Siegel, Larry	RRR000631 / 0014
2.1.4 (71)	Cameron, Jan	RRR000105 / 0001
	US Transport Council Quinn, Bob	RRR000040 / 0003
	Sandness, Robert	RRR000313 / 0004
	Californians for Safe, Clean, Efficient Nuclear Power Walker, Daniel	RRR000176 / 0002
	Nuclear Waste Strategy Coalition – NWSC Wright, David	RRR000117 / 0004
2.2 (32)	Huston/Cole, John/Jan	RRR000317 / 0017
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0004
2.2 (825)	United States Environmental Protection Agency Miller, Anne	RRR000668 / 0003
2.2 (1350)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0018
2.2 (1368)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0251
2.2 (1475)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0005
2.2 (1980)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0034
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0027
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0058
2.2.1 (43)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0019
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0036
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0007
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0009
2.2.3 (1269)	Maryland Dept. of Planning Janey, Linda	RRR000129 / 0001

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2.2.4 (979)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0033
2.2.5 (2690)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0056
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0046
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0026
2.4 (65)	Huston/Cole, John/Jan	RRR000317 / 0001
2.4.1 (41)	Bonds, Julia	RRR000403 / 0008
	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0027
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000056 / 0005
2.4.1 (41) (continued)	Humboldt River Basin Water Authority Hodges, Bennie	RRR000029 / 0002
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0010
	McGoldrick, Suzanne	RRR000231 / 0003
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0017
	City of Caliente Phillips, Kevin	RRR000641 / 0005
	Shillinglaw, Fawn	RRR000688 / 0001 RRR000689 / 0001
	Sill, Marjorie	RRR000042 / 0002
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0015
	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0005
	Zwicker, Marie Louise	RRR000549 / 0008
2.4.1 (151)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0036
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0029
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0071
2.4.1 (413)	Benti, Wynne	RRR000071 / 0002
2.4.1 (915)	United States Environmental Protection Agency Miller, Anne	RRR000668 / 0001
2.4.1 (1708)	Nuclear Waste Strategy Coalition – NWSC Wright, David	RRR000117 / 0005
2.4.1 (1995)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0020
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0013
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0011
2.4.2 (145)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0033
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0026

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2.4.2 (145) (continued)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0012
2.4.2 (380)	Zitney, Lisa	RRR000217 / 0002
2.4.2 (1931)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0017
2.4.2 (2051)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0029
2.4.2 (2574)	Benti, Wynne	RRR000071 / 0003
2.4.2 (2654)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0047
2.4.2 (2765)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0002
2.4.2 (3087)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0011
2.4.2 (4027)	Fancher, Clyde	RRR001079 / 0001
2.4.4 (37)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0018
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0035
	White Pine Nuclear Waste Project Office Simon, Mike	RRR000522 / 0016
2.4.6 (1913)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0037
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0030
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0072
2.4.6 (4092)	Fancher, Clyde	RRR001079 / 0003
2.4.7 (82)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0023
2.4.7 (962)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0016
2.4.7 (1398)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0024
2.4.7 (1709)	Nuclear Waste Strategy Coalition – NWSC Wright, David	RRR000117 / 0006
2.4.7 (4030)	Fancher, Clyde	RRR001079 / 0002
2.6 (1135)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0037
2.6 (1946)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0035
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0028
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0013
2.6 (4035)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0019
2.7.1 (128)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0008
	Eureka County Assessor's Office Mears, Michael	RRR000669 / 0001
2.7.1 (1148)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0038

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2.7.1 (1720)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0040
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0032
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0075
2.7.1 (1724)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0022
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0015
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0060
2.7.1 (1839)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0046
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0038
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0016
2.7.1 (1841)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0045
2.7.1 (1841) (continued)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0037
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0015
2.7.1 (1910)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0041
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0033
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0076
2.7.1 (2324)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0014
2.7.2 (3117)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0021
2.7.4 (54)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0047
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0039
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0018
2.7.4 (1908)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0042
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0034
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0077
2.7.4 (2623)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0035
2.7.4 (2694)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0044
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0022

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2.7.4 (2695)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0043
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0021
2.7.4 (2696)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0042
2.7.4 (2696) (continued)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0020
2.7.4 (2697)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0041
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0019
2.7.4 (2699)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0017
2.7.4 (3160)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0030
2.7.4 (3161)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0031
2.7.5 (2372)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0017
2.7.5 (2401)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0018
2.7.5 (2622)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0036
2.7.5 (3166)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0036
2.7.5 (4070)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0021
2.7.6 (1486)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0003
2.7.6 (1488)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0004
2.7.6 (2693)	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0045
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0023
2.7.6 (3201)	Western Shoshone National Council Zabarte, Ian	RRR000121 / 0021
2.7.6 (3434)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0050
2.7.6 (3435)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0051
2.7.6 (3966)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0007
2.7.6 (3976)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0013
2.7.6 (4022)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0014
2.7.6 (4076)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0025
2.7.7 (1397)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0023
2.7.7 (1399)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0025

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2.7.7 (1400)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0026
2.7.7 (1871)	State of Utah Chancellor, Denise	RRR000677 / 0020
2.7.7 (2319)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0019
2.7.7 (2689)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0057
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0049
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0027
2.7.7 (3349)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0040
2.7.7 (3425)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0041
2.7.7 (4164)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0025
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0018
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0013
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0063
2.7.7 (4173)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0059
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0051
2.7.7 (4173) (continued)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0029
2.7.7 (4175)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0055
	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0103
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0048
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0014
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0039
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0025
2.7.8 (936)	Center for Disease Control and Prevention, Dept. of Health and Human Services Dannenberg, Andrew	RRR000453 / 0001
2.7.8 (953)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0021
2.7.8 (1335)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0012
2.7.8 (1336)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0013
2.7.8 (1337)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0014

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2.7.8 (1338)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0015
2.7.8 (1345)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0016
2.7.8 (1347)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0017
2.7.8 (2692)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0024
2.7.8 (3426)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0042
2.7.8 (4071)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0022
2.7.11 (3427)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0043
2.7.11 (3428)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0044
2.7.11 (3429)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0045
2.7.12 (3430)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0046
2.7.12 (3431)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0047
2.7.12 (3432)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0048
2.7.12 (3433)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0049
2.7.13 (1485)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0002
2.7.13 (3436)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0052
2.11 (1419)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0030
2.11 (1422)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0031
2.11 (1428)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0032
2.11 (1434)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0034
2.11 (1436)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0035
2.11 (1437)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0036
2.11 (1697)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0067
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0058
2.11 (1701)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0065
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0056
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0034
2.11 (4181)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0023

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2.11 (4182)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0026
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0019
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0064
2.15 (146)	Huston/Cole, John/Jan	RRR000317 / 0014
	Zolkover, Adrian	RRR000025 / 0001
2.15 (147)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0027
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0020
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0065
2.15 (1879)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0043
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0035
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0078
2.15 (3801)	Teer, Bill	RRR000191 / 0001
2.15 (3802)	Teer, Bill	RRR000191 / 0002
2.15 (4034)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0018
2.16 (755)	State of Nevada, Dept. of Administration Coulter, Krista	RRR000451 / 0001
3.1 (933)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0011
3.1 (1962)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0023
3.1.1 (1043)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0037
3.1.2 (2)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0030
3.1.2 (2) (continued)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0005
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0023
	Nuclear Energy Institute – NEI Kraft, Steven	RRR000619 / 0008
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0068
3.1.2 (3)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0061
3.1.2 (604)	Huston, John	RRR000015 / 0002
3.1.2 (4083)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0027
3.1.3 (53)	Barnes, Kathryn	RRR000562 / 0002
	Cesena, Frank	RRR000018 / 0001
	Emmerick, Kevin	RRR000555 / 0010
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0001
	Gillette, Karl/Joan	RRR000983 / 0001

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3.1.3 (53) (continued)	State of Nevada, Agency for Nuclear Projects	RRR000038 / 0002
	Halstead, Robert	
	McGoldrick, Suzanne	RRR000231 / 0006
	O'Brien, William	RRR000209 / 0001
	Ornstein, Herbert	RRR000010 / 0001
	Snow, Rick	RRR000049 / 0001
3.1.4 (69)	Anonymous	RRR000236 / 0002
	Nuclear Energy Institute	RRR000039 / 0002
	Binzer, Chris	
		RRR000070 / 0002
		RRR000122 / 0002
	Boyd, Benedict	RRR000074 / 0002
	Nuclear Energy Institute – NEI	RRR000318 / 0002
	Kraft, Steven	
		RRR000619 / 0002
	Manner, Jim	RRR001084 / 0001
	Esmeralda County	RRR000073 / 0001
	Rannells, Ed	
	Nuclear Energy Institute	RRR000007 / 0002
	Seidler, Paul	
	Coalition 21	RRR000138 / 0001
	Tanner, John	
	Nuclear Waste Strategy Coalition – NWSC	RRR000117 / 0010
	Wright, David	
3.2 (11)	Colvin & Sons, LLC	RRR000665 / 0001
	Colvin, Tom	
	Twin Springs Ranch	RRR000072 / 0004
	Fallini, Anna	
	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0003
	Hornbeck, Ronda	
	Eureka County Board of Commissioners	RRR000664 / 0006
	Ithurralde, James	
3.2 (237)	Twin Springs Ranch	RRR000075 / 0003
	Fallini, Joe	
3.2 (575)	Ward, Dick/Korla	RRR000028 / 0001
3.2 (1053)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0042
	Hornbeck, Ronda	
3.2 (1239)	Nye County, Board of County Commissioners	RRR000656 / 0002
	Eastley, Joni	
3.2 (1328)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0261
	Hornbeck, Ronda	
3.2 (1360)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0244
	Hornbeck, Ronda	
3.2 (1361)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0245
	Hornbeck, Ronda	
3.2 (1366)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0249
	Hornbeck, Ronda	
3.2 (1830)	Triple Aught Foundation	RRR000674 / 0002
	Heizer, Michael	
3.2 (3387)	Garrett, Jo Anne	RRR000694 / 0003
3.2 (4144)	Twin Springs Ranch	RRR000072 / 0001
	Fallini, Anna	
3.2 (4215)	United States Environmental Protection Agency	RRR000668 / 0004
	Miller, Anne	

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3.2.1 (47)	Anonymous	RRR000586 / 0002
	Lander County, Board of Commissioners	RRR000646 / 0005
	Chapin, Chuck	
	Twin Springs Ranch	RRR000710 / 0002
	Fallini, Joe	
	N-6 State Grazing Board	RRR000687 / 0002
	Filippini, Hank	
	N-4 State Grazing Board	RRR000621 / 0004
	Flake, Merlin	
	Mineral County, Board of Commissioners	RRR000682 / 0001
	Fowler, Ed	
	Giese, Mark	RRR000574 / 0001
	State of Nevada, Agency for Nuclear Projects	RRR000006 / 0005
	Halstead, Robert	
		RRR000056 / 0004
		RRR000069 / 0002
	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0264
	Hornbeck, Ronda	
	Huston/Cole, John/Jan	RRR000317 / 0004
	LeFevre, Kathy	RRR000021 / 0002
	Clark County, Nevada – Dept. of Comprehensive Planning	RRR000681 / 0022
	Navis, Irene	
	Omuhundro, Charlotte	RRR000175 / 0002
	City of Caliente	RRR000641 / 0002
	Phillips, Kevin	
	Congress of the United States	RRR000290 / 0008
	Reid, Harry	
		RRR000678 / 0007
	Churchill County Commissioners	RRR000523 / 0038
	Washburn, Gwen	
3.2.1 (3141)	United States Nuclear Regulatory Commission	RRR000524 / 0017
	Weber, Michael	
3.2.1 (3142)	United States Nuclear Regulatory Commission	RRR000524 / 0018
	Weber, Michael	
3.2.3 (59)	Nye County, Board of County Commissioners	RRR000656 / 0010
	Eastley, Joni	
3.2.3 (890)	City of Caliente	RRR000641 / 0001
	Phillips, Kevin	
3.2.3 (1050)	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0028
	Loux, Robert	
3.2.3 (1178)	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0054
	Loux, Robert	
3.2.3 (3417)	U.S. Department of the Interior, Bureau of Land Management	RRR001082 / 0005
	Palma, Juan	
3.2.4 (19)	N-4 State Grazing Board	RRR000621 / 0002
	Flake, Merlin	
3.2.4 (1009)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0011
	Hornbeck, Ronda	
3.2.4.1 (17)	Colvin & Sons, LLC	RRR000665 / 0003
	Colvin, Tom	
3.2.4.1 (629)	Caliente BLM Field Office	RRR000017 / 0001
	Clementsen, Ron	
3.2.4.1 (1047)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0038
	Hornbeck, Ronda	

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3.2.4.1 (1052)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0029
3.2.4.1 (1750)	Western Shoshone Defense Project Bill, Larson	RRR000686 / 0003
3.2.4.2 (7)	Anonymous	RRR000586 / 0004
	Barnell, Todd	RRR000730 / 0009
	Bartholomew, Alice	RRR000529 / 0014
	Bonds, Julia	RRR000403 / 0016
	Castleberry, George	RRR000731 / 0009
	Covington, Cathy	RRR000492 / 0013
	Daggett, Becky	RRR000733 / 0009
	Giese, Mark	RRR000574 / 0003
	Grant, Patrick	RRR000741 / 0009
	Greenhaw, Rhonda	RRR000520 / 0014
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0007
		RRR000038 / 0004
		RRR000056 / 0006
	Harden, Cory/Martha	RRR000404 / 0013
	Holzberg, Steve	RRR000491 / 0014
	Illegible	RRR000573 / 0009
	Irwin, Larry	RRR000478 / 0007
	Linda, Deb	RRR000577 / 0012
	Linda, Tom	RRR000732 / 0009
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0005
	Mareck, Katherine	RRR000571 / 0009
	Mullings, Diamond	RRR000769 / 0012
	Rouvier, Julia	RRR000570 / 0009
	Sanford, Warren	RRR000575 / 0009
	Scurlock, Rodger	RRR000764 / 0009
	Seely, Clover	RRR000913 / 0014
	Siegel, Larry	RRR000631 / 0016
	Solomon, Laurie	RRR000721 / 0005
		RRR000934 / 0005
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0016
	Zwicker, Marie Louise	RRR000549 / 0011
3.2.4.2 (8)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000056 / 0015
		RRR000069 / 0005
3.2.4.2 (1048)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0039
3.2.5 (166)	Cole, Jan	RRR000014 / 0001
		RRR000292 / 0002
	Huston/Cole, John/Jan	RRR000317 / 0016
3.2.5 (167)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0006
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0020
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0018
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0123

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3.2.5 (167) (continued)	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0013
3.2.5 (941)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0016
3.2.5 (2612)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0046
3.2.6 (94)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0010
	Cole, Jan	RRR000014 / 0003
	Twin Springs Ranch Fallini, Joe	RRR000710 / 0025
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0157
	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0007
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0030
	Ray, Dorothy	RRR000035 / 0005
3.2.7 (40)	LaVoie, Johnny	RRR000255 / 0001
	LeFevre, Kathy	RRR000021 / 0001
3.3.1 (169)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0212
	City of Caliente Moore, Ashley	RRR000118 / 0003
	Moore, Roanne	RRR000119 / 0003
	City of Caliente Phillips, Kevin	RRR000012 / 0005 RRR000116 / 0005 RRR000641 / 0014
3.3.1 (826)	City of Caliente Phillips, Kevin	RRR000641 / 0011
3.3.2 (161)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0070
	Twin Springs Ranch Fallini, Joe	RRR000710 / 0001
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0061
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0046
	McInnis, May	RRR000201 / 0001
	City of Caliente Phillips, Kevin	RRR000641 / 0008
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0039
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0012
3.3.2 (1018)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0032
3.3.2 (1031)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0069
3.3.2 (1474)	Healing Ourselves and Mother Earth Hadder, John	RRR000737 / 0004
3.3.2 (2327)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0017

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3.3.2 (4133)	Timbisha Shoshone	RRR000691 / 0008
	Kennedy, Joe	
3.3.3 (1954)	Twin Springs Ranch	RRR000710 / 0048
	Fallini, Joe	
3.3.3 (2063)	Twin Springs Ranch	RRR000710 / 0047
	Fallini, Joe	
3.3.3 (3189)	United States Nuclear Regulatory Commission	RRR000524 / 0023
	Weber, Michael	
3.3.3 (3984)	Consolidated Group of Tribes and Organizations	RRR000671 / 0053
	Arnold, Richard	
3.3.3 (3985)	Consolidated Group of Tribes and Organizations	RRR000671 / 0054
	Arnold, Richard	
3.4 (24)	Esmeralda County, Nevada, Board of County Commissioners	RRR000395 / 0002
	Boland, Nancy	
	D.C. Minerals, Inc.	RRR000814 / 0001
	Fought, Dale	
	Kirby, William	RRR000235 / 0003
	Esmeralda County, Board of County Commissioners	RRR000666 / 0002
	Kirby, William	
	O'Connor, Michael	RRR000077 / 0001
	Esmeralda County	RRR000073 / 0002
	Rannells, Ed	
		RRR000107 / 0001
	Ridgway, Virginia	RRR000076 / 0001
3.4 (462)	Metallic Goldfield, Inc.	RRR000002 / 0001
	Ward, Jeffrey	
3.4 (584)	Cameron, Jan	RRR000105 / 0003
3.4 (1966)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0024
	Gray, Charles	
3.4 (2085)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0035
	Gray, Charles	
3.4 (3589)	Californians for Safe, Clean, Efficient Nuclear Power	RRR000176 / 0003
	Walker, Daniel	
3.4.1 (18)	State of Nevada, Agency for Nuclear Projects	RRR000013 / 0007
	Halstead, Robert	
		RRR000056 / 0011
		RRR000069 / 0004
	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0013
	Loux, Robert	
3.4.1 (21)	Cole, Jan	RRR000292 / 0001
	Huston, Jon	RRR000298 / 0001
	Huston/Cole, John/Jan	RRR000317 / 0003
	Rossi, Joe	RRR000036 / 0001
	Thomas, Kristen	RRR000301 / 0001
3.4.1 (22)	City of Caliente	RRR000115 / 0002
	Acklin, Tom	
	City of Caliente	RRR000118 / 0004
	Moore, Ashley	
	Moore, Roanne	RRR000119 / 0004
	City of Caliente	RRR000012 / 0007
	Phillips, Kevin	
		RRR000116 / 0007

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3.4.1 (22) (continued)	Wadsworth, Gordon	RRR000113 / 0003
3.4.1 (23)	City of Caliente	RRR000115 / 0001
	Acklin, Tom	
	Lea, Robert	RRR000345 / 0001
	City of Caliente	RRR000118 / 0002
	Moore, Ashley	
	Moore, Roanne	RRR000119 / 0002
	City of Caliente	RRR000012 / 0004
	Phillips, Kevin	
		RRR000116 / 0004
	Nuclear Energy Institute	RRR000278 / 0002
	Seidler, Paul	
	Wadsworth, Gordon	RRR000113 / 0002
	Wadsworth, Michele	RRR000114 / 0001
	Nuclear Waste Strategy Coalition – NWSC	RRR000117 / 0007
	Wright, David	
3.4.1 (34)	Twin Springs Ranch	RRR000072 / 0005
	Fallini, Anna	
	Foremaster, Judd	RRR000253 / 0001
	Foremaster, Kelly	RRR000254 / 0001
	Nye County, Nuclear Waste Repository Project Office	RRR000658 / 0003
	Lacy, Darrell	
	Long, Patricia	RRR000033 / 0001
	Ray, Dorothy	RRR000035 / 0002
	Sill, Marjorie	RRR000042 / 0003
	Ward, Dick/Korla	RRR000028 / 0003
3.4.1 (35)	Los Angeles County Museum of Art	RRR000433 / 0001
	Govan, Michael	
	Triple Aught Foundation	RRR000674 / 0001
	Heizer, Michael	
	The Menil Collection	RRR000683 / 0001
	Helfenstein, Josef	
	Dia Art Foundation	RRR000652 / 0001
	Weiss, Jeffrey	
3.4.1 (38)	City of Caliente	RRR000115 / 0003
	Acklin, Tom	
	City of Caliente	RRR000118 / 0005
	Moore, Ashley	
	Moore, Roanne	RRR000119 / 0005
	City of Caliente	RRR000012 / 0008
	Phillips, Kevin	
		RRR000116 / 0008
	Wadsworth, Michele	RRR000114 / 0002
3.4.1 (602)	City of Caliente	RRR000115 / 0005
	Acklin, Tom	
3.4.1 (1021)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0059
	Hornbeck, Ronda	
3.4.1 (1071)	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0113
	Hornbeck, Ronda	
	City of Caliente	RRR000641 / 0012
	Phillips, Kevin	
3.4.1 (1504)	Nye County, Board of County Commissioners	RRR000656 / 0055
	Eastley, Joni	

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3.4.1 (3382)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000666 / 0006
3.4.1 (3395)	City of Caliente Phillips, Kevin	RRR000012 / 0006 RRR000116 / 0006
3.4.1 (3737)	Huston/Cole, John/Jan	RRR000317 / 0010
3.4.1 (3739)	Huston/Cole, John/Jan	RRR000317 / 0012
3.4.1 (4212)	Manner, Jim	RRR001084 / 0002
3.4.2 (42)	Alley, Charles	RRR000995 / 0003
	Anonymous	RRR000586 / 0003
	Barnell, Todd	RRR000730 / 0005
	Bartholomew, Alice	RRR000529 / 0007
	Bechtel, Dennis	RRR000981 / 0005
	Bernard, Larry	RRR000551 / 0006 RRR000728 / 0006
	Bonds, Julia	RRR000403 / 0015
	Castleberry, George	RRR000731 / 0005
	Covington, Cathy	RRR000492 / 0006
	Daggett, Becky	RRR000733 / 0005
	Giese, Mark	RRR000574 / 0002
	Grant, Patrick	RRR000741 / 0005
	Greenhaw, Rhonda	RRR000520 / 0007
	HOME – Healing Ourselves and Mother Earth Hadder, John	RRR000046 / 0003
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0006 RRR000038 / 0003 RRR000069 / 0003
	Harden, Cory/Martha	RRR000404 / 0006
	Haymaker, Annie	RRR000506 / 0004
	Holzberg, Steve	RRR000491 / 0007
	Illegible	RRR000573 / 0005
	Irwin, Larry	RRR000478 / 0006
	Linda, Deb	RRR000577 / 0008
	Linda, Tom	RRR000732 / 0005
	Mareck, Katherine	RRR000571 / 0005
	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0014
	Las Vegas Indian Center Reed, Debra	RRR000283 / 0003
	Rouvier, Julia	RRR000570 / 0005
	Sanford, Warren	RRR000575 / 0005
	Scurlock, Rodger	RRR000764 / 0005
	Seely, Clover	RRR000913 / 0007
	Siegel, Larry	RRR000631 / 0009
	Nevada Nuclear Waste Task Force, Inc. Treichel, Judy	RRR000622 / 0007
	von Ranson, Jonathan	RRR000923 / 0002
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0002
3.4.2 (542)	Lightfoot, Jack	RRR000390 / 0002
3.4.2 (643)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000006 / 0009

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3.4.2 (669)	City of Reno Cashell, Robert	RRR000314 / 0002
3.4.2 (2040)	City of Reno Cashell, Robert	RRR000680 / 0005
3.4.2 (2067)	City of Reno Cashell, Robert	RRR000680 / 0006
3.4.3 (1)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0001
	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0013
	Nuclear Energy Institute – NEI Kraft, Steven	RRR000619 / 0003
	Kuehnhackl, Krista	RRR000867 / 0004
	City of Caliente Phillips, Kevin	RRR000012 / 0003
		RRR000116 / 0003
	Californians for Safe, Clean, Efficient Nuclear Power Walker, Daniel	RRR000176 / 0006
	Nuclear Waste Strategy Coalition – NWSC Wright, David	RRR000117 / 0008
3.4.3 (20)	Barnes, Kathryn	RRR000562 / 0004
	Emmerick, Kevin	RRR000555 / 0007
	Huston, Jon	RRR000298 / 0002
	Shillinglaw, Fawn	RRR000688 / 0024
	The Toiyabe Chapter of the Sierra Club Strickland, Rose	RRR000745 / 0006
3.4.3 (354)	Kriesler, Leonard	RRR000285 / 0002
3.4.3 (605)	Huston, John	RRR000015 / 0003
3.4.3 (914)	City of Caliente Phillips, Kevin	RRR000641 / 0009
3.4.3 (919)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0023
3.4.3 (1010)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0049
3.4.3 (1061)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0048
3.4.3 (1375)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0017
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0012
3.4.3 (1502)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0053
3.4.3 (1876)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0096
3.4.3 (1912)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0038
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0031
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0073
3.4.3 (2402)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0032

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3.4.3 (3171)	Timbisha Shoshone	RRR000691 / 0056
	Kennedy, Joe	
3.4.4 (36)	Barnell, Todd	RRR000730 / 0006
	Bartholomew, Alice	RRR000529 / 0008
	Timbisha Shoshone	RRR000692 / 0007
	Beaman, Ed	
	Bechtel, Dennis	RRR000981 / 0006
	Bernard, Larry	RRR000551 / 0007
		RRR000728 / 0007
	Inyo County, Board of Supervisors	RRR000396 / 0005
	Bilyeu, Jim	
	Bonds, Julia	RRR000403 / 0009
3.4.4 (36) (continued)	Castleberry, George	RRR000731 / 0006
	Covington, Cathy	RRR000492 / 0007
	Daggett, Becky	RRR000733 / 0006
	Nye County, Board of County Commissioners	RRR000656 / 0008
	Eastley, Joni	
	Grant, Patrick	RRR000741 / 0006
	Greenhaw, Rhonda	RRR000520 / 0008
	State of Nevada, Agency for Nuclear Projects	RRR000006 / 0008
	Halstead, Robert	
		RRR000056 / 0008
	Harden, Cory/Martha	RRR000404 / 0007
	Haymaker, Annie	RRR000506 / 0005
	Holzberg, Steve	RRR000491 / 0008
	Lincoln County, Nevada, Board of County Commissioners	RRR000617 / 0250
	Hornbeck, Ronda	
	Illegible	RRR000573 / 0006
	Eureka County Board of Commissioners	RRR000664 / 0028
	Ithurralde, James	
	Linda, Deb	RRR000577 / 0009
	Linda, Tom	RRR000732 / 0006
	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0025
	Loux, Robert	
	Mareck, Katherine	RRR000571 / 0006
	Alliance for Nuclear Accountability	RRR000726 / 0004
	Meyer, Alfred	
	Rouvier, Julia	RRR000570 / 0006
	Sanford, Warren	RRR000575 / 0006
	Scurlock, Rodger	RRR000764 / 0006
	Seely, Clover	RRR000913 / 0008
	Siegel, Larry	RRR000631 / 0010
	HOME – Healing Ourselves and Mother Earth	RRR000712 / 0012
	Viereck, Jennifer	
	Zwicker, Marie Louise	RRR000549 / 0009
3.4.4 (273)	Bechtel, Dennis	RRR000305 / 0002
3.4.4 (2059)	NARUC – National Association of Regulatory Utility Commissioners	RRR000525 / 0033
	Gray, Charles	
3.4.5 (937)	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0012
	Loux, Robert	
3.4.5 (939)	State of Nevada, Agency for Nuclear Projects	RRR000663 / 0014
	Loux, Robert	

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3.4.5 (1014)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0053
3.4.5 (1983)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0031
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0024
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0069
3.4.5 (2054)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0030
3.4.5 (2055)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0031
3.4.6 (98)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0003
	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0028
	Esmeralda County, Board of County Commissioners Kirby, William	RRR000068 / 0002 RRR000235 / 0004 RRR000666 / 0003
	Nuclear Energy Institute – NEI Kraft, Steven	RRR000619 / 0007
3.4.6 (99)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0008
	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0022
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0004
3.4.6 (99) (continued)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000068 / 0003 RRR000235 / 0006 RRR000666 / 0005
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0008
3.4.6 (911)	City of Caliente Phillips, Kevin	RRR000641 / 0007
3.4.6 (1058)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0045
3.4.6 (1241)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0004
3.4.6 (1362)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0006
3.4.6 (1511)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0062
3.4.7 (78)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0114
3.4.7 (1051)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0041
3.4.7 (1075)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0117

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3.4.7 (2565)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0025
3.4.7 (4074)	Alley, Charles	RRR000995 / 0015
3.6 (92)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0039
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0062
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0051
3.6 (93)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0006
3.6 (93) (continued)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0014
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0153
	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0014
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0042
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0009
3.6 (105)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0007
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0040
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0268
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0035
3.6 (107)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0043
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0028
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0023
3.6 (109)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0029
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0029
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0024
3.6 (112)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0023
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0151
3.6 (120)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0045
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0013
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0037
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0013

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3.6 (120) (continued)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0013
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0032
	Californians for Safe, Clean, Efficient Nuclear Power Walker, Daniel	RRR000176 / 0009
	Corporation of Newe Sogobia Wells, John	RRR000836 / 0013
3.6 (124)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0033
	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0013
3.6 (129)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0028
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0011
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0012
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0007
3.6 (132)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0066
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0012
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0041
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0057
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0080
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0036
3.6 (133)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0017
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0035
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0106
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0030
3.6 (177)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0211
	City of Caliente Phillips, Kevin	RRR000641 / 0019
3.6.2 (87)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0176
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0023
3.6.2 (88)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0072
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0087
	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0033

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3.6.2 (90)	Alley, Charles	RRR000995 / 0005
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0198
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0040
3.6.2 (91)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0063
3.6.2 (102)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0061
3.6.2 (106)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0012
		RRR000056 / 0014
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0085
	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0011
3.6.2 (122)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0015
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0054
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0010
3.6.2 (127)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0051
3.6.2 (130)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0009
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0032
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0051
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0021
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0027
3.6.2 (131)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0038
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0050
3.6.2 (1091)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0078
3.6.2 (3114)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0018
3.6.3 (85)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0035
3.6.3 (85) (continued)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0022
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0072
3.6.3 (86)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0099
3.6.3 (96)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0008
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0031

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3.6.3 (96) (continued)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0073
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0026
3.6.3 (108)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0016
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0011
3.6.3 (110)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0088
3.6.3 (467)	Inyo County, Board of Supervisors Bilyeu, Jim	RRR000396 / 0006
3.6.3 (1032)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0070
3.6.3 (1102)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0083
3.6.3 (1105)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0091
3.6.3 (1155)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0150
3.6.4 (83)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0109
3.6.4 (95)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0007
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0224
3.6.4 (126)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0107
3.6.4 (1063)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0105
3.6.4 (1982)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0032
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0025
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0070
3.6.4 (2400)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0031
3.7 (1030)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0068
3.7 (1079)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0121
3.7 (1213)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0181
3.7 (4109)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0014
3.7.1 (116)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0071
	Twin Springs Ranch Fallini, Anna	RRR000072 / 0002
	Twin Springs Ranch Fallini, Joe	RRR000710 / 0008
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0003

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3.7.1 (116) (continued)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0001
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0062
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000056 / 0012
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0131
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0012
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0043
	Moore, Richard	RRR000943 / 0001
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0001
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0040
3.7.1 (117)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0011
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0021
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0019
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0010
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0135
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0050
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0014
3.7.1 (118)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0031
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0024
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0122
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0019
3.7.1 (428)	Congress of the United States Reid, Harry	RRR000290 / 0007
3.7.1 (566)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0006
3.7.1 (801)	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000056 / 0010
3.7.1 (888)	Allen, John	RRR000034 / 0001
3.7.1 (940)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0015
3.7.1 (1027)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0065
3.7.1 (1028)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0066
3.7.1 (1083)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0129

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3.7.1 (1123)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0163
3.7.1 (1127)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0166
3.7.1 (1136)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0136
3.7.1 (1153)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0041
3.7.1 (1179)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0055
3.7.1 (1200)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0169
3.7.1 (1202)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0170
3.7.1 (1427)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0011
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0006
3.7.1 (1487)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0066
3.7.1 (1594)	Emmerick, Kevin	RRR000555 / 0002
3.7.1 (1664)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0012
3.7.1 (1688)	Corporation of Newe Sogobia Wells, John	RRR000836 / 0008
3.7.1 (1845)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0005
3.7.1 (1952)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0019
3.7.1 (2101)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0028
3.7.1 (2103)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0026
3.7.1 (2300)	Cole, Jan	RRR000014 / 0002
3.7.1 (3052)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0024
3.7.1 (3106)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0010
3.7.1 (3113)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0017
3.7.1 (3152)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0040
3.7.1 (3193)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0046
3.7.1 (3486)	Ray, Dorothy	RRR000035 / 0003
3.7.1 (3679)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000666 / 0009
3.7.1 (3683)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000666 / 0010
3.7.1 (4111)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0016
3.7.1 (4126)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0031

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3.7.1 (4185)	Colvin & Sons, LLC Colvin, Tom	RRR000665 / 0004
3.7.1 (4225)	Esmeralda County, Nevada, Board of County Commissioners Boland, Nancy	RRR000395 / 0001
	Kirby, William	RRR000235 / 0002
3.7.2 (114)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0137
3.7.2 (360)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0014
3.7.2 (1088)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0125
3.7.2 (1330)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0262
3.7.2 (1565)	Emmerick, Kevin	RRR000555 / 0004
3.7.2 (1872)	State of Utah Chancellor, Denise	RRR000677 / 0019
3.7.2 (2531)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0040
3.7.2 (2754)	Shillinglaw, Fawn	RRR000688 / 0057
3.7.2 (2757)	Shillinglaw, Fawn	RRR000688 / 0054
3.7.2 (2759)	Shillinglaw, Fawn	RRR000688 / 0052
3.7.2 (3120)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0024
3.7.2 (3121)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0025
3.7.2 (3122)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0026
3.7.2 (3123)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0027
3.7.2 (3159)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0029
3.7.3 (173)	Huston/Cole, John/Jan	RRR000317 / 0005
3.7.3 (1081)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0127
3.7.3 (1082)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0128
3.7.3 (1084)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0130
3.7.3 (1089)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0126
3.7.3 (1119)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0160
3.7.3 (1120)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0161
3.7.3 (1121)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0162
3.7.3 (1133)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0133
3.7.3 (1134)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0134
3.7.3 (1348)	Congress of the United States Reid, Harry	RRR000678 / 0008
3.7.3 (1470)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0063

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3.7.3 (1717)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0092
3.7.3 (3521)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0059
3.7.3 (4150)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0035
3.7.3 (4156)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0042
3.7.3 (4160)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0040
3.7.3 (4166)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0043
3.7.4.1 (115)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0141
3.7.4.1 (174)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0138
	Huston/Cole, John/Jan	RRR000317 / 0008
3.7.4.1 (824)	United States Environmental Protection Agency Miller, Anne	RRR000668 / 0002
3.7.4.1 (1140)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0139
3.7.4.1 (1211)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0179
3.7.4.1 (1349)	Congress of the United States Reid, Harry	RRR000678 / 0009
3.7.4.1 (1491)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0068
3.7.4.1 (1671)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0005
3.7.4.1 (3162)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0032
3.7.4.1 (3164)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0034
3.7.4.1 (3419)	U.S. Department of the Interior, Bureau of Land Management Palma, Juan	RRR001082 / 0003
3.7.4.1 (3664)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0002
3.7.4.1 (4148)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0047
3.7.4.1 (4149)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0048
3.7.4.1 (4152)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0037
3.7.4.1 (4159)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0045
3.7.4.2 (140)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0032
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0011 RRR000056 / 0013
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0182
3.7.4.2 (154)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0003

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3.7.4.2 (154) (continued)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0183
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0035
3.7.4.2 (159)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0184
3.7.4.2 (1095)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0081
3.7.4.2 (1125)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0025
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0046
3.7.4.2 (1141)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0140
3.7.4.2 (1143)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0142
3.7.4.2 (1168)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0188
3.7.4.2 (1170)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0190
3.7.4.2 (1181)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0057
3.7.4.2 (1216)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0185
3.7.4.2 (1217)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0186
3.7.4.2 (1218)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0187
3.7.4.2 (1443)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0042
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0037
3.7.4.2 (1496)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0070
3.7.4.2 (1563)	Emmerick, Kevin	RRR000555 / 0001
3.7.4.2 (1869)	State of Utah Chancellor, Denise	RRR000677 / 0022
3.7.4.2 (2076)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0034
3.7.4.2 (2077)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0033
3.7.4.2 (2098)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0031
3.7.4.2 (2114)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0027
3.7.4.2 (2316)	Sollinger, Nancy	RRR000078 / 0001
3.7.4.2 (4147)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0046
3.7.4.2 (4153)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0038
3.7.4.2 (4154)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0039
3.7.5 (148)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0024

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3.7.5 (148) (continued)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0145
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0019
	U.S. Department of the Interior, Bureau of Land Management Palma, Juan	RRR001082 / 0004
3.7.5 (158)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0036
3.7.5 (1122)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0026
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0045
3.7.5 (1131)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0132
3.7.5 (1144)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0143
3.7.5 (1145)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0144
3.7.5 (1147)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0146
3.7.5 (1171)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0191
3.7.5 (1194)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0193
3.7.5 (1197)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0196
3.7.5 (1198)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0197
3.7.5 (1370)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0253
3.7.5 (1498)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0071
3.7.5 (1549)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0011
3.7.5 (1564)	Emmerick, Kevin	RRR000555 / 0003
3.7.5 (1643)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0016
3.7.5 (1644)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0015
3.7.5 (1645)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0014
3.7.5 (1999)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0040
3.7.5 (2000)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0038
3.7.5 (2066)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0039
3.7.5 (2100)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0029
3.7.5 (2136)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0021
3.7.5 (2137)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0020

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3.7.5 (2156)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0019
3.7.5 (2157)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0018
3.7.5 (2158)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0017
3.7.5 (3103)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0034
3.7.5 (3167)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0037
3.7.5 (3168)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0038
3.7.5 (3169)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0039
3.7.5 (3415)	U.S. Department of the Interior, Bureau of Land Management Palma, Juan	RRR001082 / 0001
3.7.5 (3946)	Moore, Richard	RRR000943 / 0003
3.7.6 (445)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0005
3.7.6 (446)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0007
3.7.6 (1182)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0058
3.7.6 (1183)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0059
3.7.6 (1497)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0009
3.7.6 (1551)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0013
3.7.6 (1567)	Emmerick, Kevin	RRR000555 / 0008
3.7.6 (2479)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0020
3.7.6 (3146)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0037
3.7.6 (3147)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0038
3.7.6 (3156)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0043
3.7.6 (3158)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0044
3.7.6 (3186)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0020
3.7.6 (3187)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0021
3.7.6 (3188)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0022
3.7.6 (3192)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0045
3.7.6 (3198)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0049
3.7.6 (3640)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000666 / 0008
3.7.6 (3666)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0009

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3.7.6 (3803)	Teer, Bill	RRR000191 / 0003
3.7.6 (4026)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0015
3.7.6 (4028)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0016
3.7.6 (4037)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0056
3.7.6 (4146)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0054
	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0001
3.7.7 (48)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0006
	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0006
	Durham, Barbara	RRR000067 / 0003
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0257
	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0007
3.7.7 (63)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0074
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0065
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0200
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0042
3.7.7 (64)	Gillum, Rita	RRR000079 / 0001
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0199
3.7.7 (66)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0260
	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0044
3.7.7 (79)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0043
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0124
	McGoldrick, Suzanne	RRR000231 / 0004
3.7.7 (80)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0056
	U.S. Department of the Interior, Bureau of Land Management Palma, Juan	RRR001082 / 0002
3.7.7 (81)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0013
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0009
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0015
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0004
3.7.7 (1150)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0147

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3.7.7 (1159)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0154
3.7.7 (1191)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0202
3.7.7 (1193)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0204
3.7.7 (1386)	Congress of the United States Reid, Harry	RRR000678 / 0010
3.7.7 (1387)	Congress of the United States Reid, Harry	RRR000678 / 0011
3.7.7 (1506)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0057
3.7.7 (1532)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0075
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0066
3.7.7 (2057)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0032
3.7.7 (2613)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0045
3.7.7 (2793)	Esmeralda County Rannells, Ed	RRR000073 / 0003
3.7.7 (3684)	Esmeralda County, Board of County Commissioners Kirby, William	RRR000666 / 0011
3.7.7 (3740)	Huston/Cole, John/Jan	RRR000317 / 0013
3.7.7 (4138)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0042
3.7.8 (210)	Sill, Marjorie	RRR000042 / 0004
3.7.8 (364)	Durham, Barbara	RRR000102 / 0001
3.7.8 (830)	Center for Disease Control and Prevention, Dept. of Health and Human Services Dannenberg, Andrew	RRR000452 / 0001
3.7.8 (831)	City of Caliente Phillips, Kevin	RRR000641 / 0013
3.7.8 (1110)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0034
3.7.8 (1222)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0228
3.7.8 (1301)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0213
3.7.8 (1304)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0214
3.7.8 (1327)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0007
3.7.8 (1331)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0263
3.7.8 (1369)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0252
3.7.8 (1507)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0058
3.7.8 (1537)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0086

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3.7.8 (1620)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0085
3.7.8 (1698)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0088
3.7.8 (1702)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0089
3.7.8 (1761)	NARUC – National Association of Regulatory Utility Commissioners Gray, Charles	RRR000525 / 0034
3.7.8 (1775)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0090
3.7.8 (1803)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0091
3.7.8 (1996)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0106
3.7.8 (2313)	Nuclear Energy Institute – NEI Kraft, Steven	RRR000619 / 0004
3.7.8 (2314)	Nuclear Energy Institute – NEI Kraft, Steven	RRR000619 / 0005
3.7.8 (2337)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0023
3.7.8 (2369)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0026
3.7.8 (2398)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0029
3.7.8 (2399)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0030
3.7.8 (2415)	Twin Springs Ranch Fallini, Joe	RRR000075 / 0005
3.7.8 (2416)	Williams, Harry	RRR000103 / 0001
3.7.8 (2417)	Emmerick, Kevin	RRR000555 / 0005
3.7.8 (2418)	Emmerick, Kevin	RRR000555 / 0006
3.7.8 (3089)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0027
3.7.8 (3108)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0012
3.7.8 (3487)	Ray, Dorothy	RRR000035 / 0004
3.7.8 (3497)	Brown, Richard	RRR000024 / 0002
3.7.8 (3584)	McGoldrick, Suzanne	RRR000231 / 0005
3.7.8 (3649)	Lim, Kingman	RRR000373 / 0006
3.7.8 (4224)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0008
3.7.9 (834)	City of Caliente Phillips, Kevin	RRR000641 / 0016
3.7.9 (835)	City of Caliente Phillips, Kevin	RRR000641 / 0017
3.7.9 (836)	City of Caliente Phillips, Kevin	RRR000641 / 0018
3.7.9 (2135)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0022
3.7.9 (2532)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0041
3.7.9 (3045)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0041

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3.7.10 (1093)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0033
3.7.10 (1162)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0156
3.7.10 (1176)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0052
3.7.10 (1204)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0172
3.7.10 (1205)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0173
3.7.10 (1206)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0174
3.7.10 (1663)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0013
3.7.10 (2478)	Emmerick, Kevin	RRR000555 / 0009
3.7.10 (3116)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0020
3.7.11 (232)	Boyd, Benedict	RRR000074 / 0001
3.7.11 (1998)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0044
3.7.11 (2617)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0041
3.7.11 (2758)	Shillinglaw, Fawn	RRR000688 / 0053
3.7.12 (1499)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0050
3.7.12 (1508)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0059
3.7.13 (168)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0032
	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0010
3.7.13 (3143)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0019
3.7.13 (3154)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0042
3.7.13 (3982)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0052
3.7.14.1 (387)	Esteves, Pauline	RRR000066 / 0001
3.7.14.1 (951)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0019
3.7.14.1 (1490)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0005
3.7.14.1 (1492)	Duckwater Shoshone Tribe Millett, Jerry	RRR000693 / 0006
3.7.14.1 (1892)	United States Department of the Interior Anspach, Allen	RRR000672 / 0001
3.7.14.1 (2567)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0011
3.7.14.1 (3104)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0035
3.7.14.1 (4036)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0020
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0018

Comment-Response Document Location	Commenter	Comment Document / Comment Number
3.7.14.1 (4120)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0029
3.7.14.1 (4151)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0036
3.7.14.2 (1583)	Timbisha Shoshone Kennedy, Joe	RRR000690 / 0034 RRR000691 / 0070
3.7.14.2 (2489)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0039
	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0022
3.7.14.2 (2492)	Big Pine Paiute Tribe of the Owens Valley Moose, Virgil	RRR000675 / 0024
3.7.14.2 (2568)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0012
3.7.14.2 (2569)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0013
3.7.14.2 (2571)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0015
3.7.14.2 (2640)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000101 / 0001
3.7.14.2 (2670)	Esteves, Pauline	RRR000066 / 0002
3.7.14.2 (3520)	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0058
3.7.14.2 (3957)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0001
3.7.14.2 (4032)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0017
3.7.14.2 (4081)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0026
3.7.14.2 (4123)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0030
3.8 (1353)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0239
3.8 (1354)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0240
3.8 (1355)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0241
3.8 (1356)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0238
3.8 (1357)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0242
3.8 (1359)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0243
3.8 (1651)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0041
3.8 (3986)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0055
3.8 (4226)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0272
3.8 (4227)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0273
3.11 (1042)	State of Nevada, Agency for Nuclear Projects Loux, Robert	RRR000663 / 0024

Comment-Response Document Location	Commenter	Comment Document / Comment Number
3.11 (1307)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0215
3.11 (1310)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0217
3.11 (1311)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0218
3.11 (1312)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0219
3.11 (1314)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0220
3.11 (1315)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0221
3.11 (1316)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0222
3.11 (1318)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0223
3.11 (1321)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0225
3.11 (1323)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0226
3.11 (1334)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0011
3.11 (1523)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0084
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0074
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0054
3.11 (1525)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0082
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0072
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0052
3.11 (1526)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0081
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0071
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0051
3.11 (1528)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0080
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0070
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0050
3.11 (1531)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0076
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0067
3.11 (1837)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0094
3.11 (1942)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0101

Comment-Response Document Location	Commenter	Comment Document / Comment Number
3.11 (1955)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0046
3.11 (1956)	Twin Springs Ranch Fallini, Joe	RRR000710 / 0045
3.11 (1979)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0102
3.11 (2614)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0044
3.11 (3196)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0048
3.11 (4155)	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0041
3.11 (4170)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0078
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0068
3.11 (4170) (continued)	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0005
3.11 (4171)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0085
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0075
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0055
3.11 (4172)	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0030
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0022
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0216
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0017
3.11 (4174)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0095
3.11 (4176)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0047
3.11 (4177)	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0021
	United States Nuclear Regulatory Commission Weber, Michael	RRR000524 / 0012
3.12 (139)	City of Caliente Acklin, Tom	RRR000115 / 0004
	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0033
	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0011
	Colvin & Sons, LLC Colvin, Tom	RRR000665 / 0002
	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0009
	Twin Springs Ranch Fallini, Joe	RRR000710 / 0049
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0016

Comment-Response Document Location	Commenter	Comment Document / Comment Number
3.12 (139) (continued)	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0013
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0008
	State of Nevada, Agency for Nuclear Projects Halstead, Robert	RRR000013 / 0008
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0040
	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0032
	Timbisha Shoshone Kennedy, Joe	RRR000691 / 0009
	Nye County, Nuclear Waste Repository Project Office Lacy, Darrell	RRR000658 / 0001
	City of Caliente Larson, Keith	RRR000016 / 0001
	McInnis, May	RRR000249 / 0001
	City of Caliente Moore, Ashley	RRR000118 / 0006
	Moore, Roanne	RRR000119 / 0006
	Clark County, Nevada – Dept. of Comprehensive Planning Navis, Irene	RRR000681 / 0020
	U.S. Department of the Interior, Bureau of Land Management Palma, Juan	RRR001082 / 0006
	City of Caliente Phillips, Kevin	RRR000012 / 0009
		RRR000116 / 0009
		RRR000641 / 0006
	Sollinger, Nancy	RRR000078 / 0002
	Western Range Service Steninger, Al	RRR000020 / 0001
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0008
	Wadsworth, Gordon	RRR000113 / 0004
	Wadsworth, Michele	RRR000114 / 0004
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0003
3.12 (4186)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0069
	Twin Springs Ranch Fallini, Joe	RRR000710 / 0050
	N-6 State Grazing Board Filippini, Hank	RRR000687 / 0028
	N-4 State Grazing Board Flake, Merlin	RRR000621 / 0043
	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0056
	Nye County, Nuclear Waste Repository Project Office Lacy, Darrell	RRR000658 / 0007
	City of Caliente Larson, Keith	RRR000016 / 0002
	John Uhalde and Company Uhalde, Gracian	RRR000618 / 0038
	Wadsworth, Michele	RRR000114 / 0003

Comment-Response Document Location	Commenter	Comment Document / Comment Number
3.14 (2454)	Twin Springs Ranch Fallini, Anna	RRR000072 / 0003
3.14 (3832)	Zwicker, Marie Louise	RRR000549 / 0010
3.15 (152)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0060
	Congress of the United States Reid, Harry	RRR000678 / 0006
3.15 (833)	City of Caliente Phillips, Kevin	RRR000641 / 0015
3.15 (1060)	Lincoln County, Nevada, Board of County Commissioners Hornbeck, Ronda	RRR000617 / 0047
3.15 (1541)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0087
3.15 (1985)	Lander County, Board of Commissioners Chapin, Chuck	RRR000646 / 0029
	Mineral County, Board of Commissioners Fowler, Ed	RRR000682 / 0022
	Churchill County Commissioners Washburn, Gwen	RRR000523 / 0067
3.15 (1994)	Nye County, Board of County Commissioners Eastley, Joni	RRR000656 / 0105
3.15 (2315)	Nuclear Energy Institute – NEI Kraft, Steven	RRR000619 / 0006
3.15 (2451)	Eureka County Board of Commissioners Ithurralde, James	RRR000664 / 0020
3.15 (3199)	Consolidated Group of Tribes and Organizations Arnold, Richard	RRR000671 / 0050
3.16 (2653)	United States Department of Commerce Harm, Christopher	RRR000568 / 0001

Comments and Responses

COMMENTS AND RESPONSES

1.1 Proposed Action

1.1.1 Purpose and Need for Agency Action

1.1 (841)

Comment - RRR000663 / 0002

As noted in our earlier comments on DOE's Notices of Intent (NOI) to prepare the draft EISs, the actions proposed by DOE, taken together, comprise nothing less than a major restructuring of the entire Yucca Mountain high-level radioactive waste management program. The proposed changes affect the universe of repository program elements, including the actual design of repository surface facilities, the characteristics of the waste disposal packages and engineered barrier systems, the thermal characteristics of the repository subsurface, the long-term performance of the waste isolation system and how that is modeled, the repository waste acceptance process, including waste packaging and storage activities at 72 commercial reactor sites and 4 DOE facilities, and the entire national and Nevada waste transportation systems.

Response

Since completion of the Yucca Mountain FEIS in 2002, DOE has continued to develop the repository design and associated construction and operational plans. The basic elements of DOE's proposal, however, regarding the transportation, handling, and underground emplacement of spent nuclear fuel and high-level radioactive waste are fundamentally unchanged. The surface and subsurface facilities would allow DOE to operate the repository following a primarily canistered approach in which most commercial spent nuclear fuel would be packaged at the reactor sites in transportation, aging, and disposal (TAD) canisters. Any commercial spent nuclear fuel arriving at the repository in packages other than TAD canisters would be repackaged by DOE at the repository into TAD canisters. DOE would construct the surface and subsurface facilities over a period of several years (referred to as phased construction) to accommodate an increase in spent nuclear fuel and high-level radioactive waste receipt rates as repository operational capability reaches its design capacity. To address the repository design and operational plans, the Department prepared this supplement to the Yucca Mountain FEIS. The Repository SEIS supplements the Yucca Mountain FEIS by considering the potential environmental impacts of the construction, operations, monitoring, and closure of the repository under the repository design and operational plans that serve as the basis for DOE's application to the NRC for construction authorization, and by updating the analysis and potential environmental impacts of transporting spent nuclear fuel and high-level radioactive waste to the repository, consistent with transportation-related decisions the Department made following completion of the Yucca Mountain FEIS. Thus the design and operational plans proposed in the SEIS and summarized above do not represent a major change in the program's structure but rather an evolution of design elements and operational plans.

Section 2.2.1 of the Repository SEIS discusses the fuel packaging scenarios. Under the TAD canister approach, the handling of spent nuclear fuel assemblies would be minimized because operators would seal commercial spent nuclear fuel in the TAD canisters at the generator sites. During transport, surface storage, and disposal, DOE would place a TAD canister inside another vessel that provides necessary

functions such as shielding, heat dissipation, structural support, and corrosion resistance. The TAD canister is a component of systems the NRC would certify and license. DOE has adopted performance specifications to provide performance objectives for TAD canisters.

1.1 (961)

Comment - RRR000617 / 0015

Page 1-3, Section 1—The text ... states DOE needs to ship the majority of spent nuclear fuel by rail based on its decision to select the mostly rail scenario.

Recommendation: The Repository DSEIS must update the analysis regarding this decision in light of new information contained in the Rail Corridor and Rail Alignment EISs. The Repository EIS must discuss why DOE will no longer consider rail to Caliente with intermodal and truck from there to Yucca Mountain as a means to avoid or minimize environmental impacts.

Response

DOE is no longer considering any rail-to-legal-weight truck scenario.

1.1 (964)

Comment - RRR000617 / 0018

Page 2-1, Chapter 2—Pursuant to NEPA, this chapter needs to describe any "connected actions" to the repository as such. Given DOE's decision for mostly rail—and the fact that a TAD-based system is rail dependent—the rail required to serve the Yucca Mountain site is a connected action to construction and operations of the repository.

Recommendation: The SEIS must include a description of the Proposed Action (to determine a rail alignment) described in the Rail Alignment EIS as a connected action to the repository and same should be analyzed in the Repository SEIS.

Response

On April 8, 2004, DOE published a "Record of Decision on Mode of Transportation and Nevada Rail Corridor for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, NV " (69 FR 18557). DOE based its decision to select the mostly rail scenario on analyses in the Yucca Mountain FEIS. As the United States Court of Appeals for the District of Columbia Circuit noted in Nevada v. DOE, 457 F.3d 78 (DIRS 185513-State of Nevada v. Department of Energy 2006, all), the FEIS analyzed both rail corridor and rail alignment for each alternative. DOE has now prepared the Rail Alignment EIS for specific alignments within the Caliente and Mina corridors. The D.C. Circuit found this tiering approach consistent with NEPA and CEQ regulations. The relationship among the EISs is described in the Foreword to the Repository SEIS. Although the Yucca Mountain FEIS, the Repository SEIS and the Nevada Rail Corridor SEIS and Rail Alignment EIS are all related to the proposal to construct and operate the Yucca Mountain repository, they consider actions involving the jurisdiction of more than one federal agency. The Repository SEIS supplements the Yucca Mountain FEIS and considers the potential environmental impacts associated with the construction, operations, monitoring, and closure of the Yucca Mountain repository. The responsibility for issuing construction authorization and a license to receive and possess radioactive materials at the repository rests with the Nuclear Regulatory Commission (NRC). Should the NRC authorize development of the repository, DOE would be the federal agency responsible for constructing and operating the repository.

The Repository SEIS includes the potential environmental impacts of national transportation, as well as the potential impacts in Nevada from the construction and operation of a rail line along specific alignments in either the Caliente or the Mina corridor, to ensure that the Repository SEIS considers the full scope of potential environmental impacts associated with the proposed construction, operations, monitoring, and closure of the Yucca Mountain repository. Accordingly, the Repository SEIS incorporates by reference appropriate portions of the Rail Alignment EIS.

1.1 (1713)

Comment - RRR000620 / 0012

Relative distribution of vertical and horizontal storage over-packs on the Yucca Mountain aging pads (Section 2.1.2.1.3).

Section 2.1.2.1 of the DSEIS describes the waste handling facilities and operations to be performed at the GROA [geologic repository operations area]. Canistered commercial used nuclear fuel is expected to be received in either TADs or dual-purpose canisters. Commercial used fuel in dual-purpose canisters (horizontal or vertical) would be either transferred to the Wet Handling Facility to be offloaded and repackaged into TADs or transferred to the aging facility to be placed in aging overpacks (either horizontal or vertical). While DOE is to be commended for providing a balanced consideration of both vertical and horizontal storage systems, there is one statement in this section that requires clarification given that DOE postulates receiving approximately 75 to 90 percent of the commercial used nuclear fuel in TAD canisters for which DOE has, at present, only specified a vertical Aging overpack design.

On page 2-18 a discussion is provided that "Transportation casks that contained horizontal dual-purpose canisters would be moved to a transfer trailer and from there to the aging pad where the horizontal dual-purpose canisters would be pushed into the aging overpack." If DOE intends to provide for horizontal aging at the aging facility, this should be explained. Otherwise, those transportation casks that contain horizontal dual-purpose canisters would more effectively be directed to the wet handling facility to be unloaded immediately and repackaged into TAD canisters that would then be aged vertically.

In describing any plans for both vertical and horizontal aging DOE should address the additional operational complexities that would result from using two distinctly different aging systems because of different methods of handling (hydraulic ram, horizontal transfer vehicle, etc.). The environmental impacts of a dual system would need to be compared to those that would result from the pre-aging transfer of the commercial used fuel from horizontally-based canister systems into TAD canisters to provide for aging of the used fuel in the vertical configuration, like the rest of the used fuel. In doing this, DOE should continue to seek a fair balance between the need to simplify operations at the repository sites and the need to accommodate a diverse range of disposal customers using both vertical and horizontal systems at reactor sites.

Purpose of underground panel access

Section 2.1.2.2.1, pages 2-25 through 2-27, discusses access to the underground panels. It is not clear whether the access discussed is for construction, emplacement, or both. This should be clarified.

Thermally accelerated drifts

Section 2.1.5, page 2-41, discusses obtaining data "...during the preclosure period using thermally accelerated drifts." The concept of thermally accelerated drifts should be explained.

Response

DOE would provide aging at the Aging Facility using both vertical aging overpacks for vertical dual-purpose canisters and TAD canisters and horizontal aging modules for horizontal dual-purpose canisters. It is not necessary to compare or contrast the effects of an aging system that provides for both vertical and horizontal aging to those of an aging system that provides for only vertical aging. Both vertical and horizontal aging capabilities would be needed at the Aging Facility for operational flexibility and to allow receipt of commercial spent nuclear fuel to be decoupled from its emplacement.

While the Wet Handling Facility could receive horizontal dual-purpose canisters in transportation casks, DOE proposes to avoid submerging the transportation cask in the pool (contaminating the cask with pool water containing radioactive constituents) unloading horizontal dual-purpose canister transportation casks into horizontal aging modules, and then using a site-specific shielded transfer cask to transfer the horizontal dual-purpose canister to the Wet Handling Facility. In addition, the shielded transfer cask would be used to up-end the horizontal dual-purpose canister and to support it during opening and handling in the Wet Handling Facility.

Section 2.1.2.1 of the Repository SEIS contains additional explanation regarding horizontal dual-purpose canisters. It explains the specific process for moving and aging horizontal dual-purpose canisters, including the specific equipment necessary, such as the horizontal aging modules and positioning equipment.

In relation to reference to underground panels, DOE has clarified Section 2.1.2.2.1 of the Repository SEIS to indicate access is for excavation and construction.

In relation to the concept of thermally accelerated drifts, DOE has modified Section 2.1.5 of the Repository SEIS to explain thermally accelerated drifts.

1.1 (2665)

Comment - RRR000661 / 0008

It is unclear what the relationship of the proposed action in the Draft SEIS (that is, shipping 90 percent of spent fuel by rail using TADs) is to the “mostly rail” shipping scenario evaluated in the 2002 Final Yucca Mountain EIS and later adopted by DOE as the preferred shipping mode in a subsequent Record of Decision. This should be clarified in the final SEIS, since the 90 percent scenario differs significantly from the 2002 FEIS “mostly rail” scenario. The 2002 FEIS scenarios do not provide a proposed action (for national transportation) with “measurable goals and targets” nor do they reflect a modal mix for cross-country transport that reflects “best practice” for a campaign of this importance.

Response

As described in Chapter 1, Section 1.2, of the Repository SEIS, in 2006 DOE modified the approach to repository design, development, and operation. Central to this approach is the use of a canister concept for commercial spent nuclear fuel that minimizes handling individual spent fuel assemblies; limits the need for complex surface facilities; and simplifies repository design, licensing, construction, and operation. DOE would use a TAD canister to transport, age, and dispose of commercial spent nuclear fuel without ever reopening the canister, thereby simplifying and reducing the number of operations involved in the packaging of spent nuclear fuel for disposal. In addition, the canistered approach offers the advantage of the use of practices that are familiar to the nuclear industry and the NRC, which would make the repository easier to design, license, construct, and operate. Overall, the use of TAD canisters, which could only be transported in rail transportation casks, does not markedly affect the modal mix for

national transportation and is consistent with the mostly rail scenario evaluated in the FEIS. Appendix A, Section A.2, of the Repository SEIS presents a sensitivity analysis that considers a scenario under which only 75 percent of commercial spent nuclear fuel would be placed in TAD canisters at the commercial sites, with the remainder being placed in TAD canisters at the repository.

1.1 (3105)

Comment - RRR000995 / 0026

A commenter asked the following question: "Will the plutonium at the Pantex Plant, Rocky Flats Environmental Technology Site, Los Alamos and Lawrence Livermore National Laboratories be treated by this proposed action? If so, why are these not included in the maps, transportation routes, and analysis?" The response stated that they would be processed and shipped from the Savannah River Site to the repository.

1. Why are you shipping this spent nuclear fuel from those locations mentioned above to the Savannah River Site and then to the Yucca Mountain Repository?
2. If such nuclear spent fuel needs to be converted into either mixed-oxide fuel (MOX) or into immobilized plutonium, wouldn't it seem logical to have such spent nuclear fuel be processed at one of those locations mentioned above instead of shipping it across country to the Savannah River Site for conversion and then placed into disposable containers prior to then being shipped to the Yucca Mountain Repository?
3. Why not have the spent nuclear fuel from those locations mentioned above be shipped straight to the Yucca Mountain Repository?

With them being shipped straight to the Yucca Mountain Repository, there would be a greater chance of not having an accident by having it shipped across country to the Savannah River Site and then to the Yucca Mountain Repository.

Response

DOE has identified some weapons-usable plutonium as surplus to national needs. The material includes purified plutonium, nuclear weapons components, and materials and residues that could be processed to produce purified plutonium. At present, DOE stores these plutonium-containing materials at sites throughout the United States.

The shipment of plutonium, spent-nuclear fuel, and other nuclear materials to specific locations such as the Savannah River Site is based on broad programmatic decisions considering factors such as a site's technical capabilities, existing or planned facilities, and security. DOE has addressed the management of surplus plutonium in the *Surplus Plutonium Disposition FEIS* (DIRS 118979-DOE 1999, all), which is being supplemented. DOE also addressed the management of spent nuclear fuel in the *Programmatic FEIS on the Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Program* (DIRS 101802-DOE 1995, all). Elements of these EISs are included in the assessment of cumulative impacts in this Repository SEIS at Chapter 8, Section 8.4.1.5.

The surplus plutonium would be managed in one of two ways: (1) it would be remanufactured into mixed-oxide fuel, which could be used in commercial reactors, or (2) it would be immobilized within high-level radioactive waste canisters at the Savannah River Site prior to transport to the repository.

Once plutonium or spent nuclear fuel has gone through the remanufacturing or immobilization steps, the residual waste forms would be candidates for disposal in a repository at Yucca Mountain.

1.1 (4075)

Comment - RRR000995 / 0016

It has been stated that the Cask Maintenance Facility would periodically remove casks from service and perform maintenance and inspection. What is considered periodically?

Response

The frequency of cask maintenance, which includes the inspection, testing, and recertification of individual and assembled cask components, would be established by the cask system designer in its application to the NRC and may be based on the number of uses, by time (for example, annually), or both. Periodic maintenance frequency for cask transporters, lifting appurtenances, and other cask system ancillary equipment is often based on national standards.

1.1.1.1 Purpose and Need for Agency Action

1.1.1 (4190)

1.1.2 Decision on Proposed Action

1.1.3 General Opposition to the Proposed Action

1.1.3 (15)

Comment - 668 comments summarized

General Opposition to the Proposed Action

Commenters expressed general opposition to the Proposed Action to construct, operate, monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain; other commenters expressed general opposition to nuclear power in general. While many commenters did not identify specific deficiencies or problems with the Proposed Action, others expressed opposition to the Proposed Action by stating their support for the No-Action Alternative and the desire that the Nation discontinue development of the proposed Yucca Mountain Repository. A number of commenters who expressed opposition to the repository through support of the No-Action Alternative did so because the Proposed Action would require the transportation of spent nuclear fuel and high-level radioactive waste across the Nation. Specific issues cited included concerns for health and safety or economic impacts in the State of Nevada; treatment of Nevada as a dumping ground for the rest of the country (some commenters noted that no nuclear power is generated in Nevada); concern over the potential for terrorist attacks either during transportation or at the repository; the unfair political selection of Yucca Mountain for study; mistrust in DOE or the government in general, especially pertaining to providing accurate safety information; unfair influence of the nuclear industry over the choice of Nevada for the repository location; safety for future generations; and concerns over specific repository performance issues, including the threat of earthquakes and groundwater contamination; and potential transportation problems. Many commenters cited more than one issue in their comments.

A common basis for opposition was seismic activity. The site is on an active fault line; earthquakes have recently been felt in Las Vegas. Commenters noted Nye County is too unstable geologically to support a

nuclear waste repository. Some commenters cited the threat of volcanic activity. Others noted that studies have shown a rise in the water table into the repository at some time in the future.

Commenters expressed the belief that the repository is unsuitable because water seepage would cause radiation to leak into the groundwater and threaten water supplies by contaminating the groundwater in Amargosa Valley and Death Valley National Park. There was a belief by many commenters that transportation accidents would be likely to happen and termed the activity "mobile Chernobyls." Commenters expressed concern over the possibility of developing cancer from exposures due to operations at the repository or from transportation of spent nuclear fuel and high-level radioactive waste to the repository from the waste generator sites across the country. A few commenters stated that accumulating all the Nation's waste in one place is not safe and felt that such a concentration of waste would invite a terrorist attack.

Response

DOE acknowledges the commenters' opposition to the Proposed Action, opposition to the repository location in Nevada, and the range of concerns about the safety of transportation and repository operational plans. DOE has complied with the provisions of the NWPA. The NWPA directs DOE to evaluate the geologic disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. The NWPA also states that DOE need not consider alternative sites to the Yucca Mountain site. Because of the large number of comments received that opposed the repository in general and for a range of specific reasons, DOE refers commenters who submitted the comments summarized here to the discussion of issues in the introduction to this Comment-Response Document 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).

1.1.4 General Support for the Proposed Action

1.1.4 (16)

Comment - 109 comments summarized

General Support for the Proposed Action

Commenters expressed broad general support for the Proposed Action to construct, operate, monitor, and eventually close a geologic repository at Yucca Mountain for the disposal of spent nuclear fuel and high-level radioactive waste. Commenters stated that they were in favor of the repository or that they did not want to burden future generations with disposal of spent nuclear fuel, or they cited one or more examples from a range of positive attributes associated with the repository. Other commenters expressed support for the Proposed Action by stating their opposition to the No-Action Alternative and the need to move forward with the licensing and construction of the proposed Yucca Mountain Repository. Commenters also expressed support for the repository because utility companies need DOE to remove existing inventories of spent nuclear fuel from temporary storage at power plants—a process that ratepayers and utilities have been supporting with payments into the Nuclear Waste Fund. In addition, some commenters expressed support for a Yucca Mountain Repository and favored monitored retrievable storage as part of the operations at the Yucca Mountain site. Commenters also noted the extremely safe record of transporting spent nuclear fuel in the United States and in other countries.

Response

DOE acknowledges the commenters' support for the proposed Yucca Mountain Repository and the associated analyses in the Repository SEIS. Because of the large number of comments received in general support of the repository, DOE refers the commenters who have submitted the comments summarized here to the discussion of issues at the beginning of this Comment-Response Document and to other comments and responses related to specific topics of interest (see the Comment-Response Document Table of Contents).

1.2 NEPA Process

1.2 (4)

Comment - 5 comments summarized

Incorporation by Reference

Several commenters indicated that they were adding to a "continuum of comments" on the Draft Repository SEIS by incorporation of comments by reference; another commenter indicated that the commenter was resubmitting comments submitted on the Yucca Mountain EIS.

Response

DOE handled the incorporation of comments by reference to other documents in one of three ways: (1) For a comment submitted for a separate completed process, which includes scoping for the three NEPA documents under consideration, DOE did not provide a response because it had already considered the matters as described in Section 1.5.2 of the Repository SEIS, (2) For a comment submitted under a separate process that was not completed (for example, the environmental assessment on repository infrastructure), DOE responded by discussing in general what it had done in Section 4.3 of the Repository SEIS, (3) For comments submitted previously and submitted again with additional information, DOE responded to the current comments and evaluated the earlier submittals for consideration of supplemental information as it pertains to specific subject matter presented in this Comment-Response Document.

1.2 (9)

Comment - 30 comments summarized

Length of Public Comment Period

A number of commenters stated that the 90-day public comment period for the review of the Draft EISs was not adequate. Individuals, representatives of state and county governments, American Indian tribes, and other organizations requested an extension of the comment period of up to 60 days. The commenters' reasons for requesting an extension included the complexity of the documents, the size of the documents, and the fact that the comment period spanned the Thanksgiving, Christmas, and New Year holidays. A commenter stated that, in addition to the voluminous content of the Draft EISs, the documents contain hundreds of references that provide the bases for the information, findings, and conclusions and that it takes time to obtain and review the reference material.

Response

NEPA regulations require a minimum of 45 days for public review and comment on EISs. DOE asked the Affected Units of Local Government for their recommendation for the length of the public comment period. Their response was 90 days and DOE agreed to the 90-day public comment period.

1.2 (10)

Comment - 7 comments summarized

Meeting Format

Several commenters stated that they favored the meeting format utilized during the public comment period. Several other commenters stated that they preferred the on-the-record, question-and-answer format. One commenter took offense to politicians receiving priority to speak.

Response

Neither the CEQ nor the DOE NEPA regulations specify a format to be utilized during the required public hearing on DOE draft EISs. See 10 CFR 1021.313.

DOE invited members of the public to engage Department representatives in one-on-one discussions in an open-house format. The Department asked those who planned to present oral comments to register in advance by calling in advance or registering on arrival at the hearing location. DOE allotted 5 minutes to each individual who wished to speak to ensure that each registered individual had the opportunity to provide comments.

DOE recognizes that elected local, state, and national officials often have a number of public appearances on a given day and that the official's constituents at a particular meeting would want to hear that person's remarks. Therefore, the Department offers elected officials the opportunity to speak when they arrive at a meeting, if they so desire.

1.2 (12)

Comment - 19 comments summarized

Meeting Locations

Commenters stated that because Yucca Mountain and the transportation of spent nuclear fuel and high-level radioactive waste is a national issue, and because the transportation, aging, and disposal canister is a new concept, public meetings should be held all over the country and include the entire public along the transportation routes. Other commenters suggested specific meeting locations.

Response

The Department held public hearings in communities near the proposed repository and alternative rail corridors in the state of Nevada (Hawthorne, Caliente, Reno/Sparks, Amargosa Valley, Goldfield, and Las Vegas); in Lone Pine, California; and in Washington D.C. The Department encouraged commenters nationwide to submit comments at the public hearings by mail, facsimile, and the Internet during the comment period. DOE used customary means to notify the public (advertisements, press releases, and public service announcements).

The Draft Yucca Mountain EIS published in July 1999 included analyses of the impacts of national transportation. Public hearings were held on the Draft Yucca Mountain EIS within the State of Nevada and nationally. Twenty-one public hearings were held on the Draft Yucca Mountain EIS at the following locations:

- Amargosa Valley, Nevada
- Goldfield, Nevada
- College Park (Atlanta), Georgia

- Austin, Texas
- Boise, Idaho
- Caliente, Nevada
- Carson City, Nevada
- Chicago, Illinois
- Cleveland, Ohio
- Crescent Valley, Nevada
- Denver, Colorado
- Ely, Nevada
- Las Vegas, Nevada
- Lincoln, Nebraska
- Lone Pine, California
- Pahrump, Nevada
- Reno, Nevada
- Salt Lake City, Utah
- San Bernardino, California
- St. Louis, Missouri
- Washington, D.C.

The implementation of the mostly-canistered concept, as discussed in the Repository SEIS, would not noticeably affect the modal mix or impacts for national transportation and therefore is consistent with the mostly rail scenario evaluated in the Yucca Mountain FEIS.

1.2 (13)

Comment - 5 comments summarized

EIS Receipt

Several commenters indicated that they did not receive the EISs after multiple requests, or did not receive them in a timely manner. Another commenter expressed that it has been difficult to obtain access to information necessary for a full review of the EISs and that a request for hard copies of the documents had not been fulfilled.

Response

The complete set of EISs was sent to each mail recipient on record by Federal Express on October 5, 2007. In the case of individual commenters not receiving documents on a timely basis, the Department's records indicate that in a couple of cases only summaries had been requested. In those cases, summaries were initially shipped; full-sets of the EISs were subsequently sent overnight to the requestors. In one case the Department has no request on file.

The Department placed hard copies of the EISs and CD-ROMs containing images of the references and other Yucca Mountain related materials in the DOE Reading Rooms as well as on the Internet at the Yucca Mountain Project web site at http://www.ocrwm.doe.gov and on the DOE *National Environmental Policy Act* web site at http://eh.doe.gov/nepa/.

1.2 (14)

Comment - 5 comments summarized

Public Comments

Several commenters urged DOE to make every effort to review each comment submitted on the Draft Repository SEIS and explain how it considered each suggestion or concern. One commenter stated that the comments required DOE to modify the alternatives, develop and evaluate alternatives not taken seriously, supplement and improve analyses, and make factual corrections to the documents.

Response

DOE has carefully considered each of the comments submitted on the Draft Repository SEIS. This Comment-Response Document includes all the comments on the SEIS that DOE received during the public comment period and the DOE responses to those comments. As part of this Repository SEIS, DOE has included compact disks that contain electronic images of all comment documents; these images also show the bracketing of each comment into its applicable bin, which is one of the categories listed on the Table of Contents. Table CR-1 and CR-2 provide pointers to all comments DOE received from organizations and individuals, respectively. Table CR-3 is a cross-reference from the comments and responses back to the commenter(s); it identifies who made each comment and, for summary comments, the group of commenters. The responses to individual comments discuss, as appropriate, modifications and corrections to the SEIS based on public comments.

1.2 (60)

Comment - 4 comments summarized

Draft SEIS Scoping

Several commenters asserted that DOE ignored or disregarded the scoping comments submitted on the Draft SEIS, including radiation health and safety and the impacts of transporting spent nuclear fuel and high-level radioactive waste along the Union Pacific Railroad in northern Nevada and Utah. Other commenters stated that the Department could not truly issue complete EISs without conducting a national scoping process because a rail spur in Nevada will have wide reaching implications for shipments nationwide. A commenter recommended that DOE should perform a national scoping campaign for all affected communities. Another commenter stated that the SEIS should include the impacts of rail shipments in the cumulative impacts analyses.

Response

DOE considered all comments it received (oral and written) for the Draft Repository SEIS in the development of the scope of the SEIS analyses. Section 1.5.2.1 of the SEIS describes the results of the scoping process. Most of the comments received during scoping were not applicable to the scope of the SEIS; some of the scoping comments resulted in changes to the scope of the analyses, as discussed in Section 1.5.2.1.

Regarding the consideration of rail impacts along the Union Pacific Railroad in northern Nevada and Utah, DOE evaluated the potential impacts of transporting spent nuclear fuel and high-level radioactive waste along representative routes, shown on Figures G-27 and G-41 of the Repository SEIS. Chapter 6 of the SEIS provides further discussion of transportation routes. In addition, Chapter 6 of this Comment-Response Document discusses transportation route issues.

DOE conducted national scoping for the Repository SEIS. While NEPA regulations do not require public scoping for an SEIS, the Department invited comments on the scope as part of its Notice of Intent to prepare this SEIS. DOE encouraged commenters nationwide to submit comments at the public meetings and by mail, facsimile, and the Internet during the comment period, and used customary means to notify the public (advertisements, press releases, and public service announcements). DOE held public scoping meetings in Washington D.C. and the Town of Amargosa Valley, Las Vegas, and Reno in Nevada.

Section 8.4.1 of the Repository SEIS describes the cumulative impacts of transporting spent nuclear fuel and high-level radioactive waste at the national level, and Section 8.4.2 describes the cumulative impacts of transporting those materials along a Nevada rail alignment.

1.2 (101)

Comment - 3 comments summarized

Yucca Mountain Education

A commenter stated that the DOE notification process for public hearings resulted in members of the public going to the wrong facility. Other commenters suggested that DOE provide live online public hearings and use a wide range of media to educate the public on the repository project.

Response

The commenter who missed a hearing by going to the wrong facility appears to be referring to the hearing at the Reno-Sparks Convention Center on December 19th, 2007. DOE used its customary means to notify the public of meeting locations and times (advertisements, press releases, Internet notices, and public service announcements). DOE announcements included the correct information for this hearing. DOE regrets that the commenter may have received conflicting information (from other sources) and was unable to attend the hearing. If DOE finds it necessary to change the location or schedule for a hearing, the Department notifies the public via customary means. For example, this was required for the Washington, D.C. hearing held in December 2007 because the original meeting location became unavailable.

The Yucca Mountain Project has developed many public information products, including permanent and portable exhibits, information materials, models, audiovisual materials, electronic media, publications, and public outreach announcements. For more information on Project educational activities, call 1-702-295-1312 or 1-800-225-6972; or access the Internet site at www.ymp.gov.

1.2 (111)

Comment - 6 comments summarized

Infrastructure Improvements

Several commenters noted that the Draft SEIS included actions that DOE has classified as “infrastructure improvements” and were the subject of a Draft Environmental Assessment in 2006. Some of the commenters noted that they had submitted comments on those proposals as part of their review of the Draft Environmental Assessment and that their comments should be incorporated by reference into the SEIS. A commenter indicated that DOE has not initiated Section 106 (of the National Historic Preservation Act). Some of the commenters suggested the Department move forward on these actions (in advance of repository licensing) while others suggested these actions should only be addressed within the overall licensing of the project. Another commenter cited several sections of the Draft Repository SEIS that mentioned a Record of Decision for the infrastructure improvements but indicated that DOE has

stated its decision not to prepare a Record of Decision on the repository. The commenter recommended that DOE prepare a Record of Decision pursuant to 40 CFR 1502.2.

Response

The purpose of infrastructure improvements, as stated in the abstract for the *Draft Infrastructure Improvements Environmental Assessment* (DIRS 178817-DOE 2006, all), is to enhance safety at the project and enable DOE to safely continue ongoing operations, scientific testing, and routine maintenance. Comments received on the Draft EA were considered in the preparation of Section 4.3 of this Repository SEIS but have not been specifically referenced. DOE would issue a Record of Decision for infrastructure improvements, but would not issue a Record of Decision on the construction, operation, monitoring, and eventual closure of a repository at Yucca Mountain because that is not a DOE action, but rather falls within the licensing purview of the NRC.

Section 3.1.6.1 of the Repository SEIS contains information on archeological and historic resources in the repository withdrawal area. A draft programmatic agreement between DOE, the Advisory Council on Historic Preservation, and the Nevada State Historic Preservation Office has been prepared for cultural resources management related to activities for development at Yucca Mountain. While this agreement is in ongoing negotiation between the parties, DOE is abiding by Section 106 of the *National Historic Preservation Act of 1966* (16 U.S.C. Section 470f).

DOE refers commenters who submitted the comments summarized here to the discussion of issues in the introduction of this Comment-Response Document 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).

1.2 (276)

Comment - RRR000305 / 0005

The commenter expressed the wish that the Comment-Response Document would come out before the Final Repository SEIS or at the same time and that the Comment-Response Document be separate. The commenter stated that he had difficulty understanding where DOE responded to his comments on the 2002 Yucca Mountain FEIS.

Response

DOE issued the Repository SEIS, the Nevada Rail Corridor SEIS, and the Rail Alignment EIS at the same time; each of the final documents contains a Comment-Response Document.

Tables CR-1 and CR-2 at the end of the introduction to the Comment-Response Documents provide pointers to all comments received on the EISs from organizations and individuals, respectively. These tables point to the locations in the Comment-Response Documents where the reader can find particular comments and the DOE responses. On several occasions, speakers at public hearings represented other individuals. In such cases, tables list the person represented, not the person who spoke. Table CR-3 is a cross-reference from the comments and responses back to the commenter(s); it identifies who made each comment and, for summary comments, the group of commenters.

1.2 (912)

Comment - RRR000667 / 0003

In consideration of the abovementioned issues, and pursuant to our policies and procedures for conducting reviews of EISs pursuant to section 309 of the Clean Air Act, we have rated the draft SEIS as

Environmental Concerns/Insufficient Information(EC-2). See enclosed "Summary of EPA Rating System".

Response

DOE took several actions to address EPA concerns over the characterization of EPA's proposed radiation protection standards and the discussion of seismic strain rates. DOE has modified Section 5.1.1 of the Repository SEIS to better describe the proposed standards. The Department has expanded the discussion of seismic strain in Section 3.1.3.3 to characterize the nature of any apparent inconsistencies between observed and forecasted strain rates.

1.2 (1950)

Comment - RRR000867 / 0012

The commenter requested inclusion on all information lists and requested information beyond that which pertains to the Yucca Mountain Project.

Response

DOE bases mailing lists for the Yucca Mountain Project on past requests for information, past correspondence with the Department, or registration and participation at one of DOE's public hearings. An individual can also contact the Department at the Yucca Mountain Site Office address shown on page iii of Volume 1 of the SEIS. The commenter's name has been added to the Yucca Mountain Project mailing list, but the Project cannot provide information beyond the scope of the Yucca Mountain Project.

1.2 (3718)

Comment - RRR000524 / 0001

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

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

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

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

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

Response

Thank you for your comments.

1.2.1 NEPA Adequacy

1.2.1 (46)

Comment - 6 comments summarized

Use of Overly Conservative Assumptions

Commenters noted that even though the Draft Repository SEIS finds the impacts of the Proposed Action to be small, it has significantly overestimated these impacts in several respects.

Commenters cited specific instances where they believe DOE provided overly conservative assumptions and/or overestimated impacts. For example, commenters noted that the assumptions and analytical approach to health and safety, and the impacts from accidents, were bounding and could be misinterpreted by the public. The commenters also stated that the use of the revised infiltration model in the SEIS resulted in an overestimation of impacts during the postclosure period. In addition with regard to postclosure impacts, the commenters stated that the assumption that all waste packages would be destroyed in the event of an igneous intrusion is overly conservative and results in another overestimation of impacts to the reasonably maximally exposed individual.

One commenter called for a breakdown table for the construction of individual processes for the peak total dose.

The commenters acknowledged that while the use of conservative analyses provides additional confidence in safety, DOE should not use conservatism to the point that it resulted in increased complexities in repository design that could subject workers building the repository to additional risks or unnecessarily delay the repository development process.

A commenter pointed out that Section 4.0, page 4-1 of the Repository SEIS, erroneously used the word "predict" in reference to the conservative methods DOE used to estimate impacts.

Response

DOE used cautious but reasonable assumptions throughout the analyses reported in this Repository SEIS. The assumptions used for the analysis of health and safety impacts from the repository are those the Department used in its application for construction authorization.

In the presentation of health and safety impacts and impacts from potential accident scenarios, DOE has modified Sections 4.1.7 and 4.1.8 of the SEIS, respectively, to add discussions of conservative assumptions. These include, for example, the location of the maximum reasonably exposed individual, lifestyle assumptions for the offsite public, and the use of interdiction and evacuation after a postulated accident.

In some parts of the long-term performance analysis (Chapter 5 and Appendix F of the SEIS), DOE used cautious but reasonable assumptions to address uncertainties in data inputs and models. This is an approach generally accepted by the NRC for long-term analyses with uncertainties that cannot be addressed because of randomness in processes or the times over which the results must be projected. Because the assessment, of necessity, must use some data that are of shorter duration than 1 million years, estimates of impacts for postclosure performance are affected. This alone drives the need for

conservatism because the uncertainties are either large or difficult to characterize. A modeling approach using cautious but reasonable assumptions is appropriate to ensure that the extrapolation does not underestimate the impacts. In the discussion of the postclosure analysis in the Final Repository SEIS, DOE has added, where appropriate, discussion of conservatisms.

Presentation of these models in the application for construction authorization leads to a conservative approach. While the regulatory approach is defined in a manner to preclude speculation, it also carries an expectation that models will be subject to proof. In the case of the igneous intrusion scenario cited in the comment, there is no way to determine with precision what fraction of the repository's waste packages would be contacted by magma. Therefore, scientists have elected to assume for purposes of analysis that all waste packages are contacted. While this approach is likely to be conservative, it is more appropriate to use a bounding value rather than a fractional value that cannot be determined precisely.

DOE reviewed each of the instances in which the commenters thought the analyses were overly conservative. In many of these instances, the Department has added explanatory text to provide perspective and has identified the effects that a less conservative assumption might have on the results. For example, in the long-term performance modeling there is a specific analysis of the effects of conservatism on the performance results; the analysis found that these effects are not overly conservative. To provide additional perspective, DOE added several new text boxes to Chapter 6 of the SEIS.

DOE did not add a table showing a breakdown of how individual processes contribute to postclosure mean annual dose, what the commenters refer to as the "peak total dose." The time-dependent nature of the contributions is sufficiently complex that the contributions cannot be simply listed in a table. The application for construction authorization does include this information in Section 2.2.

The Department changed "predict" to "estimate" on page 4-1 of Section 4.0.

1.2.1 (55)

Comment - 20 comments summarized

Adequacy of Design and Operational Details

Several commenters stated that the design and operational details of the Proposed Action in the Repository SEIS are insufficient to allow an adequate and meaningful National NEPA evaluation. The commenters noted that the SEIS lacked a final design for the TADs, there is no final EPA radiation protection standard, and specific transportation routes are not identified. In contrast, a number of industry commenters indicated that the extensive design information in the Draft SEIS provided a sound foundation on which DOE could base its application to the NRC for a construction authorization.

Response

The suggestion that DOE must await the availability of more detailed design and operational information is not consistent with the requirements of NEPA and CEQ regulations. DOE has used the best available information in the Repository SEIS to evaluate the reasonably foreseeable environmental impacts of the Proposed Action. Section 1, Repository Design and Operational Details, in the Introduction to this CRD, discusses this key issue in more detail.

The policies and procedures of DOE and CEQ that implement the requirements of NEPA call for environmental impact analyses early in the process of development of a proposed federal project. In particular, the need to prepare an EIS early in the process is stressed throughout the CEQ regulations (40 CFR 1500.5; 40 CFR 1501.2; 40 CFR 1502.5; and 40 CFR 1508.23). In addition, there are processes for

determining if there is a need for additional NEPA analyses if there are significant new and substantial circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

1.2.1 (72)

Comment - 17 comments summarized

General Inadequacy

A number of commenters broadly indicated that the Draft Repository SEIS contained deficiencies and inadequacies in general, but did not include technical, analytical, or regulatory specificity. Rather, the commenters concluded that the Draft SEIS was inadequate; some recommended that DOE should withdraw the Draft SEIS and reissue it for public comment. A commenter noted that the SEIS is not consistent with the Draft Nevada Rail Corridor SEIS and Rail Alignment EIS or with the 2002 Yucca Mountain FEIS; the EISs should be internally consistent.

Response

The Repository SEIS was prepared pursuant to the *National Environmental Policy Act* and the NWPA. The Repository SEIS appropriately supplements the 2002 Yucca Mountain FEIS and is consistent with the Nevada Rail Corridor SEIS and Rail Alignment EIS. Table 2-3 of the Repository SEIS lists the impacts of national and Nevada transportation actions. Table 2-6 aggregates all preclosure impacts from the repository and from national and Nevada transportation actions and summarizes impacts from all actions that would occur in overlapping regions of influence. To ensure consistency, the Repository SEIS, Nevada Rail Corridor SEIS, and Rail Alignment EIS used the same inventory of spent nuclear fuel and high-level radioactive waste and the same number of shipments for analysis. Therefore, the associated occupational and public health and safety impacts in the alternative Nevada rail corridors under consideration are the same in all three documents. The Foreword of each document discusses the relationship among the three current EISs and the 2002 Yucca Mountain FEIS.

In relation to the general statements of inadequacies, DOE refers the commenter 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 on specific topics that cover the range of issues (see Comment-Response Document Table of Contents).

1.2.1 (113)

Comment - 7 comments summarized

Repository Draft SEIS Premature

Commenters believed the Repository SEIS is premature in light of the lack of a final EPA radiation protection standard, a final TAD design, and inadequate information on railway routes, and other missing pieces. A commenter stated that DOE is still not ready to move forward to license Yucca Mountain.

Response

The suggestion that DOE must await the availability of more detailed design and operational information is not consistent with the requirements of NEPA and CEQ regulations. DOE has used the best available information in the Repository SEIS to evaluate the reasonably foreseeable environmental impacts of the Proposed Action.

The policies and procedures of DOE and CEQ that implement the requirements of NEPA call for environmental impact analyses early in the process of development of a proposed federal project. In particular, the need to prepare an EIS early in the process is stressed throughout the CEQ regulations (40 CFR 1500.5; 40 CFR 1501.2; 40 CFR 1502.5; and 40 CFR 1508.23). In addition, there are processes for determining if there is a need for additional NEPA analyses if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

DOE considered the proposed EPA and NRC standards to provide a perspective on potential radiological impacts of repository performance during the postclosure period. Although these standards include specific regulatory limits that, if implemented, the NRC can use to evaluate the DOE application for construction authorization, they also provide a useful context in which to consider potential environmental impacts of the Proposed Action. Therefore, for its radiological impact analyses, DOE compared the results of the TSPA modeling to the proposed EPA standards in the Repository SEIS. If the final EPA and NRC standards differ from the proposed standards, the results of the TSPA could be compared to whatever dose limits are incorporated in the final standards.

With regard to transportation, Table 2-3 of the Repository SEIS lists the impacts of national and Nevada transportation actions. Table 2-6 aggregates all preclosure impacts from the repository and from national and Nevada transportation actions and summarizes impacts from all actions that would occur in overlapping regions of influence. To ensure consistency, the Repository SEIS, the Nevada Rail Corridor SEIS, and the Rail Alignment EIS use the same inventory of spent nuclear fuel and high-level radioactive waste and the same number of shipments for analysis. Therefore, the associated occupational and public health and safety impacts in the Nevada rail corridors under consideration are the same in all of the documents. The Foreword of each document discusses the relationship among the three current EISs and the 2002 Yucca Mountain FEIS.

1.2.1 (156)

Comment - 14 comments summarized

California Impacts

Several commenters stated that the Draft Repository SEIS was broadly deficient because it did not fully assess impacts to the State of California. The commenters stated that DOE should revise the Draft SEIS and reissue it for public comment. Reasons for the deficiencies included incomplete environmental analyses in relation to route-specific transportation and groundwater, including impacts to the aquifer at Death Valley. The commenters stated that the information on Yucca Mountain site suitability and the transportation, aging, and disposal (TAD) canister system was insufficient. They stated that use of the TAD system would result in the elevation of radiation exposure to workers at reactor sites. Commenters expressed concerns that the transportation of waste through California counties and metropolitan areas and on unsuitable back roads would result in major impacts, including those from perceived risk and stigma. In addition, DOE has not adequately notified California communities the shipments could affect. Commenters wanted more public meetings in California and were opposed to the format DOE used in the public meetings; the time DOE allotted for the review of the EISs was inadequate.

Other commenters referred to their past reviews of Yucca Mountain documents that expressed broad deficiencies and concerns over specific environmental disciplines. The State provided a list of specific documents on which it provided comments and noted that DOE was to consider its current comments together with the previously submitted comments.

Response

The SEIS adequately analyzed environmental impacts that could result from the nationwide shipment of spent nuclear fuel and high-level radioactive waste, including from California to Nevada and potential impacts to groundwater. The Department reviewed its analysis of the carbonate aquifer in particular. As discussed in the detailed comments and responses on hydrology in this Comment-Response Document in Section 7.04, DOE used analytical methods, approaches, and cautious but reasonable assumptions that conservatively represent foreseeable impacts if information was incomplete.

In the Yucca Mountain FEIS, DOE prepared a sensitivity analysis for alternative highway routes that could access the repository under the mostly legal-weight truck alternative. In response to comments, DOE has included a sensitivity analysis in Appendix A of the Repository SEIS that provides a perspective on transportation routes.

In relation to specific shipping routes and public notification, DOE would identify routes at least 4 years before shipments began and would make Section 180(c) assistance available about 4 years before shipments through a jurisdiction. At this time, many years before shipments could begin, it is premature to predict the highway routes or rail lines DOE might use. In the interim, states and tribes could designate alternate preferred routes. For the Repository SEIS, DOE identified representative highway routes consistent 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) that would reduce transit time. DOE based its identification of rail lines on current rail companies' operational practices because no comparable federal regulations are applicable to the selection of rail lines for the shipment of radioactive materials.

Sections 6.3 and 6.4 of the Repository SEIS address potential impacts of transporting spent nuclear fuel and high-level radioactive waste from generator facilities to the proposed repository. Appendix G discusses the methods and data DOE used for these analyses and contains state-level maps of representative routes.

For the TAD system, see the specific comments and responses on TAD canisters in Section 6.3.2 this Comment-Response Document.

In relation to the meeting format and locations, DOE attempted to provide an environment that made participants comfortable in their participation. Some commenters liked the format; some did not. The Department encouraged commenters nationwide to submit comments at the public meetings and by mail, facsimile, and the Internet during the comment period. It used advertisements, press releases, and public service announcements to notify the public.

DOE handled comments incorporated by reference to other documents in one of three ways: (1) For a comment submitted under a separate process that was complete, which includes scoping for the three NEPA documents under consideration, DOE did not provide a response because it had already considered the matter. (2) For a comment submitted under a separate process that was not complete (for example, an environmental assessment on repository infrastructure), DOE responded by discussing in general what it had done. (3) For comments submitted previously and submitted again with additional information, DOE responded to the current comments and evaluated the earlier submittals for consideration of supplemental information. DOE did not quantify any potential for impacts from risk perceptions or stigma as described in Section 2.4.4 of the Repository SEIS.

1.2.1 (1862)

Comment - RRR000525 / 0006

The listing on Page S-vii and diagram in Foreword Figure 1 provide a comprehensive summary of the changes in the repository plans and the transportation that are addressed and relationship among the several documents. Together, the documents serve to provide the most current representation of the complexities of the repository program. Although many matters, such as radiological effects thousands of years into the future, may remain subject to greater degrees of uncertainty compared with the more mundane environmental impacts such as air quality, the documents provide extensive details on how those impacts were assessed.

Response

Thank you for your comment.

1.2.1 (2387)

Comment - RRR000737 / 0012

The commenter pointed out that the Draft Repository SEIS is far from a supplement citing as an example exposure assumptions having been changed yielding dramatically different exposure versus time. The commenter stated that the DOE must finalize plans through NEPA before and not after licensing is initiated. The commenter noted that the President and Congress approved the project based on the Yucca Mountain FEIS and asked when the public would be able to review a final plan.

Response

DOE acknowledges that there is a difference in the long-term projections of potential exposure between the Repository FEIS and the Repository SEIS. This is not due to significant changes in the TSPA models of physical processes. It is primarily due to implementation of provisions provided for the first time in EPA proposed regulations about how to perform a total system performance assessment extending through the period of geologic stability, which EPA defined as 1,000,000 years. The guidance requires the use of more current health physics information than that specified in NRC's 2001 rule. Part 1 under the Key Issues portion of the Introduction to this CRD discusses Repository Design and Operational Details; Part II discusses the EPA standard. Section 5.1 of the Repository SEIS discusses changes in the model and the resulting impacts. Following these requirements, the results presented by DOE in the Repository SEIS address long-term scenarios in a rigorous, structured manner, and the results differ. These differences are described in the text box in Section 5.5.1 of the Repository SEIS and provide a basis for comparison between the Repository SEIS and the earlier results presented in the Repository FEIS.

The policies and procedures of DOE and CEQ that implement the requirements of NEPA call for environmental impact analyses early in the process of development of a proposed federal project. In particular, the need to prepare an EIS early in the process is stressed throughout the CEQ regulations (40 CFR 1500.5; 40 CFR 1501.2; 40 CFR 1502.5; and 40 CFR 1508.23). In addition, there are processes for determining if there is a need for additional NEPA analyses if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

1.2.1 (3719)

Comment - RRR000524 / 0002

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

Revisions to enhance completeness and to more fully characterize or bound certain aspects of the analyses:

Specific locations for some facilities or sites that are part of the proposed action have not been determined; therefore, impacts associated with their construction or operation may not have been bounded.

The cumulative impacts associated with reasonably foreseeable future actions do not appear to be fully characterized and may not be bounded.

Some of the affected environment or impacts discussions may not completely characterize the affected environment or bound potential impacts, especially with regard to the draft rail EIS.

Revisions to enhance transparency and traceability of analyses and consistency of some discussions. For example, clearly stated, traceable technical bases are not provided for certain descriptions of the affected environment and for statements regarding impacts on different resource areas.

Response

The general overview comment was supported by specific comments for each of these items and those comments are included in the applicable section of this Comment-Response Document.

1.2.1 (3721)

Comment - RRR000524 / 0004

The commenter noted that specific locations are not identified for some facilities as described in Sections 2.1.4 and 2.1.7.3.3 of the SEIS. The commenter suggested that the Final Repository SEIS include the proposed locations and associated impacts for facilities whose locations are not identified. In addition, the commenter indicated that the site location for the cask maintenance facility is inconsistent between the SEIS and the Rail EIS.

Response

In relation to the specific locations of facilities described in Sections 2.1.4 and 2.1.7.3.3 of the Repository SEIS, DOE has identified and proposed locations for the solid waste landfill, the explosives magazine storage area, and the borrow pits, and has added these locations to Section 2.1.4. Section 2.1.7.3.3 describes the Cask Maintenance Facility as being in the rail equipment maintenance yard, consistent with the Rail Alignment EIS.

1.2.2 Comments Regarding Structure of EISs

1.2.2 (50)

Comment - 8 comments summarized

Structure of the EISs

Several commenters found the overall presentation and relationship between the Repository SEIS, Nevada Rail Corridor SEIS, and Rail Alignment EIS confusing. Some asserted that it was an intentional act by DOE to confuse the public. Some commenters asserted that the structure of the three documents amounted to segmentation, which NEPA does not allow.

Response

The Foreword to each of the three EISs describes the relationship among the documents.

The Nevada Rail Corridor SEIS supplements the rail corridor analysis of the Yucca Mountain FEIS by analyzing the potential environmental impacts associated with constructing and operating a railroad within the Mina corridor. The Nevada Rail Corridor SEIS analyzes the Mina corridor at a level of detail commensurate with that of the rail corridor analysis in the Yucca Mountain FEIS.

The Rail Alignment EIS tiers from the broader corridor analyses in both the Yucca Mountain FEIS and the Nevada Rail Corridor SEIS. The Rail Alignment EIS analyzes the potential impacts of constructing and operating a railroad along common segments and alternative segments within the Caliente and Mina corridors.

The Repository SEIS supplements the Yucca Mountain FEIS by analyzing the construction, operations, monitoring, and eventual closure of a repository at Yucca Mountain. The Repository SEIS includes the potential environmental impacts of transporting spent nuclear fuel and high-level radioactive waste from 72 commercial and 4 DOE sites to Yucca Mountain. Further, the Repository SEIS includes the impacts from constructing and operating a railroad along common segments and alternative segments within the Caliente and Mina corridors. Thus, DOE has not segmented the consideration of all environmental impacts related to the proposed action to construct, operate, monitor, and eventually close a repository at Yucca Mountain. The United States Court of Appeals for the District of Columbia Circuit ruled in Nevada v. DOE, 457 F.3d 78 (DIRS 185513-State of Nevada v. Department of Energy 2006, all) that DOE's approach constituted an appropriate use of "tiering" under 40 CFR section 1508.28.

1.2.3 Agency Coordination

1.2.3 (25)

Comment - 9 comments summarized

Agency Coordination

Several agencies commented that the Proposed Action in the Repository SEIS was consistent with agency plans and stated an appreciation for the DOE commitment to work with states, local governments, American Indian Tribes, and other interested parties. An agency noted its active participation as an Affected Unit of Government in the Yucca Mountain oversight program and summarized its concerns, including the Department's assumptions in the socioeconomic analysis, the safe construction and operations of the repository, and the approach to cumulative impacts.

Response

Close cooperation with local jurisdictions and other participating agencies is fundamental to DOE policy for the successful development of the Repository Program. The Department thanks the agencies for their participation in the EIS process and has addressed general and specific concerns throughout this Comment-Response Document, including Section 1.7.7 (Socioeconomics), Section 1.7.8 (Occupational Public Health and Safety), and Section 1.11 (Cumulative Impacts).

1.2.3 (4013)

Comment - RRR000524 / 0008

5. Comment:

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

Basis:

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

Other consultations discussed in the draft repository SEIS are:

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

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

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

Response

DOE has updated Chapter 11 of the Repository SEIS with information on its consultations with other entities since the issuance of the Repository FEIS.

1.2.4 Cooperating Agencies

1.2.4 (26)

Comment - 8 comments summarized

Nye County, Nevada, representatives noted that, as a cooperating agency, the county needs to do everything in its power to represent its citizens and provide oversight in four areas:

1. Protection of health, safety, economic well-being, and quality of life of its residents;
2. Protection of the environment;
3. Ensure the repository operates safely and successfully; and
4. Ensure that the transportation system serves to advance opportunities for development.

The commenters stated that Nye County studies indicate the Yucca Mountain Repository is technically feasible and can be operated safely. A commenter expressed the wish for DOE and Nye County to collaborate in an adaptive management approach in the monitoring and assessment of socioeconomic conditions.

Response

Section 1.5.5 of the Repository SEIS describes the cooperating agency relationship between Nye County and DOE. Mitigation and adaptive management approaches are discussed in Chapter 9 of the Repository SEIS and in Section 12 of the Repository CRD. The Department appreciates Nye County's involvement in the Yucca Mountain Repository process.

1.2.4 (1894)

Comment - RRR000525 / 0009

NARUC SEIS 3 Page S-4 Nye County Community Protection Plan

We are pleased to see continued involvement by Nye County in the repository program as a cooperating agency. NARUC supports the thrust of the County's Community Protection Plan and urges that DOE be pro-active and innovative in enabling the County to achieve the objectives of those plans. We also support the proposal by Nye County for DOE to partner with the County in an adaptive management approach to monitoring and assessment of environmental and socioeconomic conditions as the repository is developed and operates over time.

Response

Chapter 9 of the Repository SEIS and Section 12 of the Repository CRD discuss mitigation and adaptive management approaches.

1.2.5 Regions of Influence

1.2.5 (2159)

Comment - RRR000522 / 0006

The Repository DSEIS fails to fully disclose potential repository system impacts beyond those generally identified through completion of analyses designed to meet the DOE perceived requirements of NRC licensing. For example, the DSEIS analyzes radiological health impacts through atmospheric pathways only in those locales and to the extent thought by DOE to be required by NRC and fails to disclose similar potential effects to populations living within the region surrounding Yucca Mountain. Accordingly, full

disclosure of potential repository system impacts as required by CEQ and DOE regulations for implementing NEPA has not occurred. As a decision support document for DOE (i.e. decision to implement rail-dependent TAD-based repository system), quite apart from the licensing requirements of NRC, the disclosure of impacts within the FSEIS must be broadened beyond the narrow requirements required of DOE by NRC for licensing.

Response

Chapter 3, Table 3-1, of the Repository SEIS defines the regions of influence associated with the 13 environmental resource areas, such as land use, groundwater, and socioeconomics, for which impacts are described. DOE defined these regions in consideration of the sliding scale approach that recognizes that agency proposals can be characterized as falling somewhere on a continuum in relation to the significance of environmental impacts. Thus, elements of the Proposed Action with a greater potential for significant environmental impacts require more analysis than elements that are likely to result in small impacts. For this reason, DOE defined regions of influence based on geographical areas in which the Department could reasonably expect direct and indirect impacts.

For example, for the repository-related impact analysis, the region of influence for land use includes all the land that DOE would have to control permanently to operate the repository. On the other hand, the region of influence for potential groundwater impacts extends far beyond the boundary of the analyzed withdrawal area because any long-term releases from the repository could affect aquifers in these more distant areas. Similarly, the region of influence for socioeconomics encompasses the economies of Nye and Clark counties, where DOE expects most of the workforce would reside. Thus, these would be the counties, if any, that would experience the most socioeconomic impacts. Regarding the region of influence for potential impacts to air quality and potential exposure to radiation, no reasonable impact scenarios were identified to justify expanding the regions of influence beyond those defined in the Yucca Mountain FEIS at 50 miles (80 kilometers).

1.2.6 Perceived Risk

1.2.6 (27)

Comment - 24 comments summarized

Many commenters stated that the Repository SEIS should analyze the impacts of stigma or risk perception. Commenters stated that people would avoid places and products associated with nuclear risk or stigma, which would result in decreased property values; less business expansion or new development; relocation of businesses away from the area; loss of tax revenues; reduced income from existing businesses; loss of new investments; inability to ensure adequate cleanup costs; higher insurance rates; decreased crop, product, and service prices, which include effects on the marketability of local specialty agricultural products; decreased business diversification; inability to retain existing businesses; unused infrastructure or infrastructure of questionable value; migration of people from an area; increased population and activity in one county that would cause a subsequent decrease in neighboring counties; environmental justice impacts due to decreased property values; and an exodus of residents from a contaminated area. Commenters also stated that the perceived risk of serious harm from the proposed repository or transportation activities would affect people's health care systems, quality of life, and spiritual well-being. In particular, commenters stated that the existence of a nuclear waste repository at Yucca Mountain 90-100 miles from Las Vegas would have a significant adverse impact on the tourist and

gaming industry. Other commenters pointed out that the Draft SEIS did not provide the impacts of stigma or perceived risk for Native Americans.

Response

Section 2.4.4 of the Repository SEIS discusses perceived risk and stigma. DOE has considered these issues, guided by the results of its own research and that of the State of Nevada, and by appropriate conclusions from reviews of this subject by the Nuclear Waste Technical Review Board in 1995 and other research that includes the independent economic study prepared in 2003 (DIRS 172307-Riddel et al. 2003, all). DOE has acknowledged that a relatively small decline of at least temporary duration in residential property values might result from the designation of transportation corridors in urban areas. While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. DOE has acknowledged that, while in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods for quantification of such impacts with any degree of certainty. Therefore, DOE did not quantify any potential for impacts from risk perception or stigma in the Repository SEIS.

Miscellaneous NEPA Comments

1.3 Legal, Regulatory, and Policy

1.3.1 NWPA

1.3.1 (4165)

Comment - 2 comments summarized

Funds for Timbisha Shoshone Tribe

The Timbisha Shoshone Tribe achieved “affected” status under the NWPA in July 2007. The Tribe has accused DOE of discrimination because the Department has not provided the Tribe “funding to conduct its own oversight and monitoring of the DOE activities and adequately prepare for the Nuclear Regulatory Commission licensing process.”

Response

DOE has not discriminated against the Timbisha Shoshone Tribe. The U.S. Department of the Interior granted the Western Shoshone, which includes the Timbisha Shoshone Tribe, affected status in 2007. At that time there was no fiscal year 2007 funding available and DOE had already submitted its fiscal year 2008 budget to Congress. Nevertheless, DOE did inform the cognizant Congressional committees of this situation, and urged that funds be allocated to the Timbisha Shoshone Tribe. In appropriating money for the Yucca Mountain Project for fiscal year 2008, however, Congress provided no funds for the Timbisha Shoshone Tribe. For fiscal year 2009, DOE has requested $500,000 for the Western Shoshone.

1.3.1 (4169)

Comment - 9 comments summarized

Financial Impact of Emergency Response

Commenters stated that the shipment of spent nuclear fuel and high-level radioactive waste would create a financial burden on local municipalities across the country as they developed the necessary emergency response capabilities in response to the shipments. Some commenters stated that the Repository SEIS

should assess the current capabilities of local emergency response agencies. Other commenters stated that Section 180(c) of the NWPA would not be adequate in funding or scope. A commenter stated that either truck or rail transportation would affect 43 states and "place a huge financial burden" on cities and municipalities across the country. The commenter is concerned that the costs associated with transportation would fall to local governments and be "strapped upon the backs of taxpayers."

Response

Congress has addressed these concerns. The NWPA requires DOE to provide technical assistance and funds to states for training public safety officials of appropriate units of local governments and Indian tribes through whose jurisdictions the Department plans to transport spent nuclear fuel or high-level radioactive waste to a repository. Section 180(c) further provides that training must cover procedures for safe route transportation of these materials as well as for emergency response situations. Section 180(c) encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions. Appendix H, Section H.7 of the Repository SEIS discusses technical assistance and funding for training public safety officials; Section H.6 discusses emergency response.

1.3.1 (344)

Comment - RRR000280 / 0003

The commenter does not understand how the Rail Alignment EIS links to the National Transportation Plan and Section 180(c) of the NWPA, which relates to funding for public safety.

Response

The NWPA requires DOE to provide technical assistance and funds to states for training public safety officials of appropriate units of local governments and Indian tribes through whose jurisdictions the Department plans to transport spent nuclear fuel or high-level radioactive waste to a repository. Section 180(c) further provides that training must cover procedures for safe route transportation of these materials as well as for emergency response situations. Section 180(c) encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions. Technical assistance and funding for training of public safety officials is discussed in Appendix H, Section H.7; emergency response is discussed in Section H.6.

1.3.1 (491)

Comment - RRR000396 / 0011

Emergency preparedness in Southeast Inyo County

The first responder to any release of nuclear material in Southeast Inyo County is the Southern Inyo Fire Protection District (SIFPD). The SIFPD has a volunteer staff of approximately 10, with one full time paid employee who acts as Chief. Response times vary based on the location of an incident. In the past, the SIFPD has received limited training to respond to a nuclear release through the DOE's Training Emergency Preparedness Program (TEPP). It is anticipated that the SIFPD would need numerous fulltime, paid employees, in addition to its current volunteer staff, if a shipping campaign to Yucca Mountain is initiated. In addition, the SIFPD would need specialized equipment and detection devices,

along with a rigorous training plan to adequately deal with a release of radionuclides in Southeast Inyo County. The Final Rail EIS should incorporate the DOE's contingency plans for any type of radioactive release in Inyo County.

Response

The NWPA requires DOE to provide technical assistance and funds to states for training public safety officials of appropriate units of local governments and Indian tribes through whose jurisdictions the Department plans to transport spent nuclear fuel or high-level radioactive waste to a repository. Section 180(c) further provides that training must cover procedures for safe route transportation of these materials as well as for emergency response situations. Section 180(c) encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions. Appendix H, Section H.7 of the Repository SEIS discusses technical assistance and funding for training public safety officials; Section H.6 discusses emergency response.

1.3.1 (577)

Comment - RRR000104 / 0001

The commenter suggested projects that DOE should fund in the vicinity of Yucca Mountain to offset costs that communities would incur as a result of the operation of a repository.

Response

Sections 116(c)(2)(A)(i) and (ii) of the NWPA state that the Secretary shall provide financial and technical assistance to the State of Nevada and any affected unit of local government requesting such assistance. Such assistance shall be designed to mitigate the impact on such state or affected unit of local government of the development of such repository and the characterization of such site. The Secretary would consider any request for financial assistance within the parameters authorized by this provision. DOE would base any decision to provide assistance under Section 116 on an evaluation of reports submitted by an affected unit of local government or the State of Nevada.

1.3.1 (944)

Comment - RRR000662 / 0001

Pursuant to the *Nuclear Waste Policy Act*, Congress overrode the Governor of Nevada's veto of the Secretary's February 14, 2002 Site Recommendation for Yucca Mountain, which was accompanied by DOE's original Yucca Mountain FEIS. Once this Congressional action occurred in the summer of 2002, DOE had 90 days under the NWPA to submit a license application to NRC for a construction authorization. It is safe to presume that the Site Recommendation, the President's authorization, and the Congressional action on Yucca Mountain were all premised in significant part on the content of the FEIS.

It is now more than 5 years past the statutory deadline for submission to NRC of a license application, and the Draft SEIS that is the subject of these comments illustrates the numerous and wide-ranging changes DOE has made in the project, and in its impacts, including an entirely new packaging and transportation system affecting more than 30 states whose Congressional representatives voted in 2002.

It is Nevada's position that the Draft SEIS so materially departs from the FEIS that it can no longer be presumed to be authorized by the President and the Congress and, accordingly, DOE should return to the President and the Congress with a new Site Recommendation based on the new SEIS/FEIS.

Response

There is no statutory requirement to seek a new Site Recommendation.

1.3.1 (956)

Comment - RRR000662 / 0007

The proposed Aging Facility, with a capacity of 21,000 MTU [metric tons of uranium] of commercial spent nuclear fuel, is functionally a Monitored Retrievable Storage (MRS) facility, which the *Nuclear Waste Policy Act* prohibits from being sited in Nevada. DOE claims that a virtue of the Aging Facility is that it decouples waste receipt from waste emplacement, which is exactly the intended purpose of the MRS. We understand that there is a need for some reasonable level of surge capacity at the repository surface facility to optimize operations. A one year surge storage capacity at the site, amounting to about 3,000 MTU of commercial spent nuclear fuel under DOE's current plans for emplacement (but ignoring emplacement of federally owned waste), might be a reasonable level to smooth potential logistical upsets in the system. This is another issue DOE has left to be decided by NRC, and possibly the Court of Appeals. Nevada has submitted extensive comments and objections to NRC's Chairman opposing DOE's proposed "aging facility," and those comments, which were copied to DOE, are also incorporated herein by reference.

Response

DOE plans for the Aging Facility are consistent with all applicable requirements.

1.3.1 (1324)

Comment - RRR000617 / 0258

In the event that DOE, as a condition of use of a rail route (i.e. crossing the Walker River Indian Reservation) or pursuant to Section 180(c) of the *Nuclear Waste Policy Act*, as amended, is required to provide training and equipment for emergency first responders, the EIS must evaluate the effectiveness of these mitigation measures and the extent to which provision of these resources as a part of each action alternative will serve to reduce exposure hazard and consequence.

180(c) grants are addressed at DOE/EIS-0250F-S1D, Volume II, H.7. The section does not evaluate the effect of these mitigation measures but simply states they will be provided under 180(c). It is not discussed as to how the grants will serve to reduce exposure hazard and consequence.

Response

The NWPA requires DOE to provide technical assistance and funds to states for training public safety officials of appropriate units of local governments and Indian tribes through whose jurisdictions the Department plans to transport spent nuclear fuel or high-level radioactive waste to a repository. Section 180(c) further provides that training must cover procedures for safe route transportation of these materials as well as for emergency response situations. Section 180(c) encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions. Appendix H, Section H.7 of the Repository SEIS discusses technical assistance and funding for training public safety officials; Section H.6 discusses emergency response. Individuals trained in procedures and on the equipment responding to a situation involving radioactive material would be better prepared to minimize their exposures, exposures to members of the public, and impacts to the environment during an event. Training programs would

involve the evaluation of the effectiveness of the training. It would be speculative to assign specific effectiveness assumptions to training for analytical purposes because of the variability of situations that could occur. Therefore DOE has not included any emergency response effectiveness values for any of the potential impact evaluations consistent with a conservative and realistic analytical technical approach. Training of individuals and providing the equipment needed to perform their jobs is a common best management practice in any vocation including emergency responders.

1.3.1 (1641)

Comment - RRR000550 / 0017

What has DOE done with the $1.8 billion annual payments into the Nuclear Waste Fund? This money should be more appropriately spent.

Response

DOE has spent the money appropriated by Congress to site and characterize a repository and to perform the activities necessary to obtain a license from the NRC. Congress determines how and when DOE may spend money held in the Nuclear Waste Fund.

1.3.1 (1658)

Comment - RRR000550 / 0019

Congress erred in 1987 in directing that Yucca Mountain be evaluated as the only site for a national geologic repository for nuclear waste and erred in not directing DOE to research alternatives to geologic repository of nuclear waste at that same time. Don't compound the error!

Most of the nuclear reactors are east of the Mississippi River and those living in the eastern half of the United States benefit most from nuclear power. Sacrificing one state, region or landscape for the convenience of those who do not live there is never appropriate public policy, and I'm told never leads to solutions so long as people do not have to live with the consequences of their lifestyles. We all know that the open land remains in the West. It remains here because we who have lived here for generations have sacrificed to protect it for everyone else. The American West is one of the last places on the planet containing what is become the most precious resource—unspoiled open space.

Realize it. Protect it.

Use technology to find solutions for nuclear waste recycling.

Response

DOE is carrying out the Congressional directive to submit a license application for the Yucca Mountain Site. Furthermore, through Section 114 of the NWPA, Congress made clear that DOE need not consider alternative sites to Yucca Mountain or nongeologic alternatives. DOE is also evaluating the Global Nuclear Energy Partnership (GNEP), which could include recycling of spent nuclear fuel. The Repository will be discussed as part of the evaluation of GNEP. Chapter 8, Cumulative Impacts, includes a discussion of GNEP in Section 8.1.2.4.1.

1.3.1 (1732)

Comment - RRR000657 / 0040

Comment: Page 9-5: A DOE-provided economic mitigation measure is mentioned in this section: Provide assistance to state or local governments to mitigate economic, social, public health and safety, and

environmental impacts under Section 11 6(c) of the *Nuclear Waste Policy Act*, as amended (NWPA) (42 U.S.C. 10101 et seq.). No value of such assistance is specified in the NWPA.

Resolution: As part of the proposed adaptive management program, DOE and Nye County should conduct a fiscal impact baseline analysis that deals only with government costs and revenues; such an approach would provide a means of estimating the fiscal impact of the Yucca Mountain Project and would give a general sense of the level of economic mitigation required from the DOE. Estimates should be made of the additional revenue from and cost for each new resident (direct, indirect, or induced worker, for example) living in Nye County as a result of the Yucca Mountain Project. This should be part of the monitoring program to document the socioeconomic baseline with and without the Yucca Mountain Project.

Response

DOE has expanded Section 9.2 of the Repository SEIS to better reflect DOE's position on adaptive management. Section 9.2.2 discusses the Department's intent to prepare a mitigation action plan which would be developed in consultation with the proposed Mitigation Advisory Board(s). Specifics regarding monitoring of mitigation measures (including the need to establish baselines) would be described in this plan.

1.3.1 (1857)

Comment - RRR000525 / 0001

The National Association of Regulatory Utility Commissioners (NARUC) has been an active stakeholder in the important matter of safe, long-term disposal of commercial spent nuclear fuel since the enactment of the *Nuclear Waste Policy Act of 1982*. That is because the NWPA sets forth two central tenets to that disposal:

a. The federal government is responsible for the permanent disposal of all commercial and government high-level radioactive waste in a geologic repository.

b. The utilities generating electricity from nuclear power are responsible for the share of disposal costs related to the spent nuclear fuel they produce.

NARUC and the State public utility commissions it represents have a direct interest in fee payments to the Nuclear Waste Fund (NWF) paid by those utilities because utility commissions oversee the pass-through of those fee payments to their ratepayers in accordance with State laws and regulations.

Response

Thank you for your comment.

1.3.1 (1861)

Comment - RRR000525 / 0005

While some reviewers of the document and stakeholders in the repository development may not have fully accepted it, it is worth emphasizing the statement on page S-1 that, "This action (the President signing into law the joint resolution in 2002 designating the Yucca Mountain site)concluded the site selection process stipulated in the NWPA." Some opposed to the development of the repository at Yucca Mountain may cling to the belief that the matter remains an open question, but that would only be so if:

a. DOE were to find new information to conclude the site is not suitable after all and would not submit a construction license application to the Nuclear Regulatory Commission (NRC), or

b. The NRC denies the construction license after finding the proposed repository does not meet regulatory requirements, or

c. Congress takes legislative action to nullify the joint resolution.

Presuming the license application now under preparation by DOE is consistent with the analysis and conclusions in this Supplemental EIS, we urge that the license application be submitted so that the technical and regulatory review can be begin by the personnel at the NRC who have the qualifications and responsibility to conduct the rigorous license review.

Response

Thank you for your comment.

1.3.1 (1906)

Comment - RRR000677 / 0013

The thousands of shipments to Yucca Mountain will also degrade local infrastructure that is vital to communities. The infrastructure must be maintained, repaired, or replaced. DOE optimistically says states, Indian tribes and local governments are "persons" under the *Price-Anderson Act* and "could be entitled to indemnification for legal liability, which would include all reasonable additional costs of responding to a nuclear incident or authorized precautionary evacuation." SEIS at H-21 (emphasis added) States, Indian tribes, and local governments should not be forced to seek judicial relief for reimbursement under the *Price-Anderson Act* for costs from an incident caused by DOE or its contractors. DOE must be responsible for all reasonable costs incidental to shipments of spent fuel or high-level waste to Yucca Mountain. Moreover, DOE must also be responsible for the costs related to a shipping incident or other impacts from operations at the Yucca Mountain repository.

Response

Thank you for your comment. Sections 116(c)(2)(A)(i) and (ii) of the NWPA state that the Secretary shall provide financial and technical assistance to any affected unit of local government requesting such assistance. Such assistance shall be designed to mitigate the impact on such state or affected unit of local government of the development of such repository and the characterization of such site. The Secretary would consider any request for financial assistance within the parameters authorized by this provision. DOE would base any decision to provide assistance under Section 116 on an evaluation of reports submitted by an affected unit of local government. The *Price-Anderson Act* indemnifies liability arising out of, or resulting from, a nuclear incident or precautionary evacuation, including all reasonable additional costs incurred by a state or a political subdivision of a state, in the course of responding to a nuclear incident or a precautionary evacuation. It excludes (1) claims under state or federal worker compensation acts of indemnified employees or persons who are at the site of, and in connection with, the activity where the nuclear incident occurs, (2) claims that arise out of an act of war, and (3) claims that involve certain property on the site. A nuclear incident is any occurrence, including an extraordinary nuclear occurrence, causing bodily injury, sickness, disease, death, loss of or damage to property, or loss of use of property, that arises out of or results from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material (42 U.S.C. 2014). Appendix H, Sections H.9.3 and H.9.4 discusses these.

1.3.1 (1932)

Comment - RRR000525 / 0021

The purpose and need for the repository remain as they were presented in the Draft EIS in 1999. Nothing in the intervening years has changed the policy first set forth in the NWPA in 1982: that the spent nuclear fuel and other high-level radioactive waste cannot remain where it is indefinitely and that geologic disposal in a suitable repository is the preferred disposition of that material. In 2002, the President and the Congress affirmed Yucca Mountain as the suitable site, with the final determination to be made by the Nuclear Regulatory Commission per the NWPA and the radiation standards to be set by the Environmental Protection Agency and as incorporated in the NRC's licensing regulation.

The SEIS does a comprehensive job of gathering much information on the environmental impacts for both the pre-closure and postclosure period which will be useful references for stakeholders in the repository both in and outside of Nevada.

Many of the environmental impacts of the proposed repository are those as would be expected of a major construction project of this magnitude in a remote desert region. What sets the project apart from other infrastructure projects is that the repository will be used for disposal of high-level radioactive material to isolate the material from human contact for an almost unimaginable period during which the planet and life forms may change in ways we cannot comprehend.

Based on the calculations of the Total Systems Performance Analysis model, DOE presents its conclusions in this SEIS that the radiation dose estimates for the various conditions set forth in the draft radiation rule are well below limits set for the pre-closure and postclosure period out to 1 million years. We expect the validity of those calculations and the assumptions used in the TSPA modeling will be a central part of the NRC license review process. Some are ready to pre-judge that review because they either support or oppose the repository at Yucca Mountain. We are not expert in such matters and must await the rigorous licensing review process that we expect to be a fair and open process.

Response

Thank you for your comment.

1.3.1 (2294)

Comment - RRR000673 / 0003

The County further reaffirms its concern regarding costs and liability in the event of an accident.

Response

The *Price-Anderson Act* indemnifies liability arising out of, or resulting from, a nuclear incident or precautionary evacuation, including all reasonable additional costs incurred by a state or a political subdivision of a state, in the course of responding to a nuclear incident or a precautionary evacuation. It excludes (1) claims under state or federal worker compensation acts of indemnified employees or persons who are at the site of, and in connection with, the activity where the nuclear incident occurs, (2) claims that arise out of an act of war, and (3) claims that involve certain property on the site. A nuclear incident is any occurrence, including an extraordinary nuclear occurrence, that causes bodily injury, sickness, disease, death, loss of or damage to property, or loss of use of property, that arises out of or results from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material (42 U.S.C. 2014). A nuclear incident is any occurrence, including an extraordinary nuclear occurrence, causing bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of

use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material (42 U.S.C. 2014). DOE discusses these in Appendix H, Sections H.9.3 and H.9.4.

1.3.1 (2782)

Comment - RRR000105 / 0002

Some shipments will be going by roadway and those roads must be upgraded to support that transportation. The upgrades must include roads that would be used as bypasses in case the primary road is closed. [U.S. Highway] 95 must be expanded to four lanes from Mercury to Tonopah and, within Amargosa Valley, [Nevada State Route] 373, Valley View from [U.S.] 95 to Farm Road, and Farm Road from Valley View to [State Route] 373 must all be improved to handle the transportation of spent fuel and the construction materials to build the repository.

If these shipments are going through rural Nevada, the communities should have the best in class emergency response training and equipment.

Response

Sections 116(c)(2)(A)(i) and (ii) of the NWPA state that the Secretary shall provide financial and technical assistance to the State of Nevada and any affected unit of local government requesting such assistance. Such assistance shall be designed to mitigate the impact on such state or affected unit of local government of the development of such repository and the characterization of such site. The Secretary would consider any request for financial assistance within the parameters authorized by this provision. Neither Section 116 nor any other provision of the Act limits the impacts that are subject to assistance under Section 116 to the environmental impacts considered in the SEIS. DOE would base any decision to provide assistance under Section 116 on an evaluation of reports submitted by an affected unit of local government or the State of Nevada pursuant to Section 116 to document likely economic, social, public health and safety, and environmental impacts.

The NWPA also requires DOE to provide technical assistance and funds to states for training public safety officials of appropriate units of local governments and Indian tribes through whose jurisdictions the Department plans to transport spent nuclear fuel or high-level radioactive waste to a repository. Section 180(c) further provides that training must cover procedures for safe route transportation of these materials as well as for emergency response situations. Section 180(c) encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions. Technical assistance and funding for training of public safety officials is discussed in Appendix H, Supplemental Transportation Information under section H.7 and emergency response is discussed in section H.6.

1.3.1 (2905)

Comment - RRR000655 / 0011

Section 180(c): The draft SEIS includes some inaccurate statements and errors that should be corrected. For example, on p. 9-7, Section 9.3.1 states that "Section 180(c) of the NWPA allows DOE to provide technical assistance and funds to states for training local government and American Indian tribal public safety officials" (emphasis added). First, the NWPA requires DOE to provide this assistance. Second, DOE must provide this assistance and funding to both states and tribes for training local officials—that is, the states will not be training the tribal officials. In addition, on pages H-18 and H-33, there are

references to "safe routing transportation" instead of "safe, routine transportation." DOE should correct these references and any other instances where this language appears.

In addition, section 9.3.1 mentions a "specific management action to mitigate impacts" in connection with the Section 180(c) training assistance, namely, "DOE could provide such training." While that may be true, the current plan is for DOE to provide assistance to states and tribes, with the latter parties being responsible for training. Rather than duplicate these efforts, a better "management action to mitigate impacts" would be to fund the development of transportation safety programs within the states and tribes, similar to what the DOE Carlsbad Field Office has done to promote the safety of WIPP [Waste Isolation Pilot Plant] shipments. The states have unanimously requested that DOE work with them to develop an approach for funding this type of activity separate from Section 180(c). DOE's draft SEIS misses the opportunity to take impact mitigation one step further by assisting in the creation or maintenance of such state- and tribal-level programs.

In section H.7 (H-18 and H-19), the draft SEIS mentions that the evaluation of Section 180(c) policy "considered programs the Department of Homeland Security and the Federal Emergency Management Agency developed and relevant DOE funding and emergency response training efforts such as the Waste Isolation Pilot Plant and Foreign Research Reactor transportation programs." The text should also mention the DOT Hazardous Materials Emergency Preparedness grant program, since this program is the basis for the recommended allocation formula in DOE's most recent Federal Register notice on Section 180(c).

Response

DOE has corrected the errors identified in Sections 9.3.1 and H.7 of the Repository SEIS associated with the language in Section 180(c) of the NWPA.

1.3.1 (3145)

Comment - RRR000121 / 0010

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Impact of diminished capacity in self-government results from the deployment of limited human and technical resources from normal day-to-day affairs to unfunded monitoring and response to DOE characterization and licensing activity.

Impacts to tribal fiscal balances from the need to review and respond to DOE documents without additional funding.

Impacts to services such as law enforcement from the lack of training or emergency preparedness equipment.

Impacts to tribal fiscal balances by the need to respond to DOE documents, reports and participation in licensing proceedings without additional funding.

Impact related to stigma of off-reservation population unwilling to relocate to tribal lands.

Response

The U.S. Department of the Interior granted the Western Shoshone, which includes the Timbisha Shoshone Tribe, affected status in 2007. At that time there was no fiscal year 2007 funding available and DOE had already submitted its fiscal year 2008 budget to Congress. Nevertheless, DOE did inform the

cognizant Congressional committees of this situation, and urged that funding be allocated to the Timbisha Shoshone Tribe. In appropriating money for the Yucca Mountain Project for fiscal year 2008, however, Congress provided no funds for the Timbisha Shoshone Tribe. For fiscal year 2009, DOE has requested $500,000 for the Western Shoshone.

In response to the specific comment about potential stigma associated with tribal lands, DOE is not aware of a valid method to translate perceptions into quantitative impacts. For this reason, DOE addressed but did not quantify the potential for impacts from risk perceptions or stigma in the SEIS.

1.3.1 (3239)

Comment - RRR001054 / 0002

The commenter expressed concern that budget reductions will result in cutting back on safety.

Response

Congress authorizes funding for DOE activities. DOE would construct and operate the repository pursuant to NRC regulations governing protection of public health and safety.

1.3.1 (3715)

Comment - RRR000264 / 0001

The commenter stated that DOE "shall" immediately order all work on Yucca Mountain stopped and the project mothballed; ... inform the President and Congress" that Yucca Mountain "is not a winning proposition" and that there is a "low probability that Yucca Mountain will [ever] be licensed, constructed or any [railroad] shipments will be [allowed]; ... and "request permission to redirect all available Yucca Mountain Funds to be used in a appropriate new National Geological Repository Siting Studies," including transportation methods and costs, salt domes and granite mountain sites (excluding Nevada's mountains and basins), and public involvement.

Response

The NWPA requires DOE to submit an application to the NRC for construction authorization for a repository at Yucca Mountain in Nevada. DOE is complying with this requirement.

1.3.1 (3828)

Comment - RRR000269 / 0003

The commenter suggested that DOE establish a contingency fund for health issues that could arise from this project, given the large number of people who could be affected along transportation routes, including those working at nuclear utilities, people in neighborhoods through which DOE would transport waste, and those working at the repository. The commenter urged DOE to consider how those exposed to radiation would be compensated for future medical bills, and referred to those working at the Nevada Test Site and "downwinders" who have difficulty receiving compensation for medical bills.

Response

The Repository SEIS analyzes the potential environmental impacts of the Proposed Action to construct, operate, monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. The *Price-Anderson Act* indemnifies liability arising out of, or resulting from, a nuclear incident or precautionary evacuation, including all reasonable additional costs incurred by a state or a political subdivision of a state, in the course of responding to a nuclear

incident or a precautionary evacuation. It excludes (1) claims under state or federal worker compensation acts of indemnified employees or persons who are at the site of, and in connection with, the activity where the nuclear incident occurs, (2) claims that arise out of an act of war, and (3) claims that involve certain property on the site. A nuclear incident is any occurrence, including an extraordinary nuclear occurrence, causing bodily injury, sickness, disease, death, loss of or damage to property, or loss of use of property, that arises out of or results from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material (42 U.S.C. 2014). DOE discusses these in Appendix H, Sections H.9.3 and H.9.4.

1.3.1 (3829)

Comment - RRR000270 / 0003

The commenter stated that the Union Pacific Railroad in Clark County and several incorporated cities is directly adjacent to not only the Clark County Government Center and all the major Las Vegas Strip resorts and casino hotels, but to tens of thousands of residents, business, and visitors. She expressed concern about the high cost to local taxpayers from the project and that there would be an "unfunded mandate to local taxpayers to cover the cost of first response, emergency management," and other impacts to government services.

Response

Sections 116(c)(2)(A)(i) and (ii) of the NWPA state that the Secretary shall provide financial and technical assistance to any affected unit of local government requesting such assistance. Such assistance shall be designed to mitigate the impact on such state or affected unit of local government of the development of such repository and the characterization of such site. The Secretary would consider any request for financial assistance within the parameters authorized by this provision. DOE would base any decision to provide assistance under Section 116 on an evaluation of reports submitted by an affected unit of local government or the State of Nevada pursuant to Section 116 to document likely economic, social, public health and safety, and environmental impacts.

The NWPA requires DOE to provide technical assistance and funds to states for training public safety officials of appropriate units of local governments and Indian tribes through whose jurisdictions the Department plans to transport spent nuclear fuel or high-level radioactive waste to a repository. Section 180(c) further provides that training must cover procedures for safe route transportation of these materials as well as for emergency response situations. Section 180(c) encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions. Appendix H, Section H.7 of this Repository SEIS discusses technical assistance and funding for training of public safety officials. Section H.7 discusses emergency response.

1.3.1 (3913)

Comment - RRR000737 / 0003

The commenter asked how the Repository SEIS process fits into the NEPA process and asserted that the current process does not seem to be a legitimate NEPA process because the President and Congress already approved Yucca Mountain for the repository. He further asserted that DOE should have prepared the Repository and Rail Corridor SEISs before the Site Recommendation and that the Site Recommendation was premature.

Response

The NWPA directs the Secretary of Energy, if the Secretary decides to recommend approval of the Yucca Mountain site for development of a repository, to submit a Final EIS with a recommendation to the President. To fulfill that requirement, DOE prepared 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* (DIRS 155970-DOE 2002, all) (Yucca Mountain FEIS).

Since the completion of the Yucca Mountain FEIS, DOE has continued to develop the repository design and associated construction and operational plans. As now proposed, the surface and subsurface facilities would enable DOE to operate the repository using a primarily canistered approach in which most commercial spent nuclear fuel would be packaged at the reactor sites in TAD canisters. DOE would repackage any commercial spent nuclear fuel that arrived at the repository in packages other than TAD canisters at the repository in TAD canisters. The Department would construct the surface and subsurface facilities over a period of several years (referred to as phased construction) to accommodate an increase in spent nuclear fuel and high-level radioactive waste receipt rates as repository operational capability reached its design capacity.

To address modifications to the repository design and operational plans DOE has prepared this Repository SEIS, consistent with the NEPA and the NWPA. The SEIS supplements the Yucca Mountain FEIS by considering the potential environmental impacts of the construction, operations, monitoring, and closure of the repository under the modified repository design and operation, and by updating the analysis and potential environmental impacts of transporting spent nuclear fuel and high-level radioactive waste to the repository, consistent with transportation-related decisions the Department made following completion of the Yucca Mountain FEIS.

The United States Court of Appeals held that "The DOE has acted well within its discretion in following the tiered approach regarding rail corridor selection and alignment and accordingly, has not violated NEPA" (DIRS 185513-State of Nevada v. Department of Energy 2006, all)

1.3.1 (3971)

Comment - RRR000671 / 0010

The CGTO knows that Nye County does not include Timbisha, Yomba and Duckwater reservations in their activities funded under the *Nuclear Waste Policy Act*.

Response

Thank you for your comment.

1.3.1 (4121)

Comment - RRR000995 / 0022

The commenter suggested the need to clarify how funding of the study, construction, and operation of the repository occurs. Suggested topics included information on the Nuclear Waste Fund, its purpose, how is it controlled, and the current status of funds (are the funds restricted to be used only on the repository?). In addition the commenter suggested clarification on how the appropriation process will occur (with phased construction is the entire construction funding be appropriated prior to the start of construction?

Response

DOE provides an annual budget request to Congress and has spent the money appropriated by Congress to site and characterize a repository and to perform the activities necessary to obtain a license from the NRC. Congress determines how and when DOE can spend the money in the Nuclear Waste Fund. The budget and funding cycle is not the subject of a NEPA evaluation.

1.3.2 Legal Issues

1.3.2 (4167)

Comment - 104 comments summarized

Treaty of Ruby Valley

Commenters expressed concerns that the United States Government has not honored the Ruby Valley Treaty of 1863 with the Western Shoshone Nation. They indicated that there remains an unsettled land dispute that DOE has ignored, and that the treaty remains in full force and effect; a settlement has not been reached that satisfies the United States and the Western Shoshone National Council. Other commenters noted that the Treaty of Ruby Valley granted specific rights, authority, title, and interest within the boundaries of Western Shoshone Territory for the benefit of Western Shoshone citizens. Commenters stated that if DOE constructed a repository at the Yucca Mountain Site, it would be trespassing on Shoshone land. The Western Shoshone have refused payment of more than $145 million for the mountain because they want the Federal Government to return the land. Commenters noted the importance of continued use of the land for vital spiritual ceremonial, food, medicine, shelter, hunting, gathering, and watering, and as burial sites. Commenters further noted that the U.S. Constitution mandates direct consultation and coordination on a Nation-to-Nation basis. Commenters also stated that on March 10, 2006 in Geneva, Switzerland, a historic and strongly worded decision by the United States Nations Committee for the Elimination of Racial Discrimination (CERD) that the United States was urged to “freeze”, “desist” and “stop” actions being taken or threatened to be taken against the Western Shoshone Peoples of the Western Shoshone Nation, of which the Timbisha Shoshone are a part. In its decision, CERD stressed the “nature and urgency” of the Shoshone situation informing the US that is goes “well beyond” the normal reporting process and warrants immediate attention under the Committee’s Early Warning and Urgent Action Procedure.

Response

The Western Shoshone Tribe maintains that the Ruby Valley Treaty of 1863 gives them rights to 97,000 square kilometers (37,000 square miles) in Nevada, which includes the Yucca Mountain region. A legal dispute with the Federal Government led to a monetary award as payment for the land. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury.

In July 2004, President George W. Bush and Congress approved payment to the Western Shoshone Tribe of more than $145 million in compensation and accrued interest based on the 1872 value of 97,000 square kilometers (37,000 square miles) (Public Law 108-270; 118 Stat. 805). Under provisions of the law, payment by the United States Government officially subsumed Western Shoshone claims to 97,000

square kilometers of land in Nevada, Utah, California, and Idaho, based on the Ruby Valley Treaty of 1863. The law will distribute approximately $145 million in funds that the Indian Land Claims Commission awarded the Tribe. There are approximately 6,000 eligible tribal members, and the law sets aside a separate revenue stream for educational purposes.

On March 4, 2005, the Western Shoshone National Council filed a lawsuit against the United States, DOE, and the U.S. Department of the Interior in the federal district court in Las Vegas, Nevada. The complaint sought an injunction to stop federal plans for the use of Yucca Mountain as a repository based on the five established uses of the land within the boundaries of the 1863 Ruby Valley Treaty. On May 17, 2005, the U.S. District Court rejected a request from the Western Shoshone National Council for a preliminary injunction to stop DOE from applying for a license for the Yucca Mountain Project. Chapter 3, Section 3.1.1.3 of the SEIS discusses this issue.

1.3.2 (4184)

Comment - 2 comments summarized

Water Appropriations

Commenters noted that the State of Nevada has been resistant to issuing water permits for the Yucca Mountain Project. They want to know how the Project would obtain water if the state does not grant water rights.

Response

DOE filed a water appropriation request with the Office of the Nevada State Engineer on July 22, 1997, for permanent rights to withdraw 430 acre-feet of water annually. These applications were for the five well sites at J-12, J-13, and the C-Wells complex. The use is considered industrial and includes but is not limited to road construction, facility construction, drilling, dust suppression, tunnel and pad construction, testing, culinary and domestic uses, and other uses that relate to the site. These water appropriation permit applications have been denied by the Nevada State Engineer. The U.S. Department of Justice, on behalf of DOE, has appealed this decision in U.S. District Court.

1.3.3 Regulations

1.3.3 (4168)

Comment - 15 comments summarized

EPA Standard

The commenter stated, “that there is no radiation protection standard for this project,” and that the proposed standard would be “unjust” for future generations because after 10,000 years the standard becomes “relaxed by a factor of 24.”

Response

In preparing the Repository SEIS, DOE considered the EPA proposed regulation and conforming NRC rule to provide a perspective on the potential radiological impacts of the repository during the period of geologic stability (up to 1 million years). If the Repository SEIS analysis is inconsistent with any requirement of the final EPA regulation or NRC rule, DOE will perform the required additional analysis. If the final EPA regulation and NRC rule do not require changes to the way in which DOE calculated repository performance, the results of the TSPA as reported in the Repository SEIS could be compared to

the final dose limits, as measured by whatever measure of compliance is selected and incorporated into the final regulation and rule.

DOE has continued to refine the TSPA model since the 2002 Yucca Mountain FEIS was issued. Although the TSPA analysis presented in the final Repository SEIS reports different results from those reported in the 2002 Yucca Mountain FEIS, the differences are largely attributable to the requirements in the EPA proposed regulation and NRC rule. The proposed regulation sets forth for the first time requirements for calculating repository performance during the period of geologic stability, and requires the use of more current health physics information than that specified in NRC's 2001 rule (see Chapter 5 of the SEIS). The TSPA model used in the License application is also used in the final Repository SEIS to estimate potential radiological impacts during the period of geologic stability.

The EPA and the NRC are the agencies responsible for development and finalization of the proposed regulations not DOE.

1.3.3 (4228)

Comment - 2 comments summarized

DOE EMS and DOE Orders

Commenters have suggested the DOE Environmental Management System be used to manage revisions of Yucca Mountain related DOE Orders, specifications, and regulations.

Response

Thank you for your comment.

1.3.3 (427)

Comment - RRR000290 / 0006

Despite the fact that the department can change its assumptions in order to manipulate radiation dose data, they continue to refuse to make the Total System Performance Assessment (TSPA) model acceptable [available] to stakeholders like the State of Nevada or NRC to verify DOE'S calculations. How can the DOE possibly expect the NRC to adopt the Yucca Mountain EIS if the model used to draft them is kept secret?

Response

This SEIS and the application for construction authorization that DOE has submitted to the NRC make public the TSPA model the Department used to estimate repository performance.

1.3.3 (674)

Comment - RRR000427 / 0002

Referring to the DOE Licensing Support Network, the commenter stated that when the Nevada Attorney General asked for the documents, DOE withheld them claiming a work product privilege. He noted, however, that both the NRC and the court ruled that the documents prepared for the license application cannot be shielded under work product privilege.

Response

This comment is not related to the SEIS and, therefore, requires no response.

1.3.3 (885)

Comment - RRR000223 / 0002

The commenter stated that the Draft Repository SEIS does not mention or recognize a quality assurance program and that DOE must comply with DOE Order 414.1C and 10 CFR 63.142, which considers items important to safe waste isolation and related activities.

Response

As a conservative approach, DOE did not take credit for the beneficial attributes of a quality assurance program in preventing or minimizing potential environmental impacts.

1.3.3 (908)

Comment - RRR000667 / 0001

It should be noted that because EPA's final public health and environmental radiation protection standards (40 CFR part 197) have not yet been finalized, EPA's review of the postclosure safety analyses in the SEIS was limited to the broader aspects of the analyses, such as the characterization of EPA's proposed standards or the description of geologic or other processes at the site. Nevertheless, EPA recommends that DOE accurately reflect the language in the proposed standards. For example, on page 5-4 of the SEIS, Section 5.1.1, DOE states "The proposed EPA standards require DOE to represent long-term climate using a probabilistic distribution for a constant-in-time but uncertain long-term average climate for Yucca Mountain specified by NRC." EPA's proposal does not require that long-term climate be represented by constant conditions; rather, EPA allows it to be represented in this way after finding that such a representation would simplify the analyses while still addressing the most important aspects of long-term climate change.

Response

DOE has modified the Repository SEIS to reflect the language of the EPA proposed regulation and conforming NRC rule.

1.3.3 (935)

Comment - RRR000445 / 0003

When it becomes evident that this site cannot meet the required safety standards, instead of abandoning the site, the safety standards have been repeatedly lowered!! This is unconscionable, not to mention dangerous and potentially lethal.

Response

Thank you for your comment.

1.3.3 (1000)

Comment - RRR000617 / 0002

More important, and as discussed more fully below in Section I, the DOE's approach appears to be part of a coordinated effort with the Nuclear Regulatory Commission ("NRC") to illegally restrict the scope of the NRC's own NEPA review in the licensing proceedings that the NRC will hold on the Department's Yucca Mountain application.

Response

Thank you for your comment.

1.3.3 (1003)

Comment - RRR000617 / 0005

It appears that the DOE has balkanized its NEPA review in such a confusing and improper manner in furtherance of its desire (and that of the NRC) to insulate the NRC licensing proceeding from many of the considerations that must be taken into account under NEPA—including but not limited to transportation-related environmental impacts. This intent is made plain in the "Foreword" to the Rail Corridor DSEIS and Rail Alignment DEIS. There, DOE states that the Repository SEIS "evaluates the potential environmental impacts of constructing and operating the Yucca Mountain repository under the design and operation plans, the purpose of which is *to assist the [NRC] in adopting, to the extent practicable, any EIS prepared pursuant to Section 114(f)(4) of the Nuclear Waste Policy Act, as amended, ...*" In contrast, DOE states that the Rail Corridor SEIS and Rail Alignment EIS "evaluate the potential environmental impacts of constructing and operating a railroad for shipments of spent nuclear fuel and high-level radioactive waste from an existing rail line in Nevada to the repository at Yucca Mountain, the purpose of which is *to help the Department decide whether to construct and operate a railroad*, and, if so, within which corridor and along which alignment." (emphasis added).

In other words, according to the DOE, only the site repository's environmental impacts will be subject to the NRC's review under NEPA (and very limited review at that, given the NRC's illegal interpretation of the statutory criteria governing its decision whether to adopt DOE's EIS, as discussed below), whereas transportation-related environmental impacts will be considered only by the DOE in its selection of a rail corridor and rail alignments.

In this manner, the DOE (and the NRC) impermissibly seek to restrict the proper scope of the NRC licensing proceeding. This short-sighted approach ultimately will prove self-defeating for both agencies; because it virtually ensures that any NRC approval of DOE's license application for Yucca Mountain will be judicially reversed.

Despite the duplicative and overlapping discussions in three impact statements, DOE has correctly defined the Yucca Mountain project to include transportation—and it has acknowledged that all significant transportation impacts therefore must be addressed in the Repository impact statement "to ensure that the Repository SEIS considers the full scope of potential environmental impacts associated with the proposed construction and operation of the repository."

Since all transportation-related impacts must be considered as part of the site repository EIS, they all must be considered by the NRC and are properly at issue in the NRC licensing proceeding. See Nuclear Energy Institute, Inc. v. Environmental Protection Agency, 373 F.3d 1251, 1313 (D.C. Cir. 2004) ("NEI") (where the D.C. Circuit flatly rejected the NRC's contention that the NWPA allows the NRC to "adopt" the Department's EIS without independently reviewing the adequacy of that EIS). The fact that the DOE intends to issue a separate Record of Decision for the rail alignment designation does not abrogate the NRC's own independent obligation under NEPA to determine the adequacy of the DOE's environmental analyses. Because, as the Repository FEIS acknowledges (and NEPA demands), transportation is part of the proposed action and transportation-related impacts are within the scope of that EIS, the NRC's independent adequacy review must include a review of all transportation-related impacts including the designation of rail corridors and rail alignments.

Further, the Nuclear Waste Policy Act ("NWPA") does not provide any basis for the NRC to avoid considering all environmental impacts associated with the proposed Yucca Mountain project, including those related to transportation of nuclear waste to the repository. The NWPA directs the NRC to "adopt" DOE's environmental impact statement "to the extent practicable." 42 U.S.C. 100134(f)(4). The NRC has interpreted this phrase to mean that it is not required to evaluate independently whether the EIS "meets the standards for an adequate statement," as it otherwise would be required to do under NEPA. See for example, 10 C.F.R. 51.109; see also NEPA Review Procedures for Geologic Repositories for High-Level Waste, Proposed Rule, 53 Fed. Reg. 16131 (May 5, 1988), and Final Rule, 54 Fed. Reg. 27864 (July 3, 1989). Specifically, the NRC contends that it must review the DOE's EIS only to the extent that new information or a change in the project requires supplemental environmental reviews. 10 C.F.R. 51.109. However, this position is contrary to the regulations implementing NEPA promulgated by the CEQ, case law and, most importantly, the NWPA itself.

Under the CEQ's NEPA regulations, which are applicable to all federal agencies including the Department and the NRC, an "agency may adopt a Federal draft or final environmental impact statement or portion thereof provided that the statement ... meets the standards for an adequate statement under these regulations." 40 C.F.R. 1506.3. An agency adopting another agency's EIS has a duty to "independently review" the EIS to determine whether it is legally sufficient. See, for example, Guidance Regarding NEPA Regulations, 48 Fed. Reg. 34263 (1983); see also Sierra Club v. U.S. Army Corps of Engineers, 295 F.3d 1209 (11th Cir. 2002) ("NEPA regulations require an agency to undertake an independent review of a lead agency's EIS before adopting it."); Davis Mountains Trans-Pecos Heritage Assn. v. Federal Aviation Admin., 116 Fed. Appx. 3, n. 64 (5th Cir. 2004) ("in order for a cooperating agency to adopt the lead agency's EIS, the NEPA process actually requires the cooperating agency to do some independent study after the final EIS has been prepared").

Nonetheless, the NRC, while acknowledging that its regulations for adopting DOE's FEIS "might be seen as a departure from established practices," has concluded that "NWPA and the principles of res judicata obviate the need for an entirely independent adjudication of the adequacy of the EIS by this agency." Proposed Rule, 53 Fed. Reg. at 16138. The NRC's reasoning, flawed to begin with, was made even less compelling because three years later Congress essentially mooted all challenges to DOE's reliance on the FEIS at the conclusion of the Department's site selection process by enacting a joint resolution selecting Yucca Mountain as the repository site—thereby rendering the concept of res judicata irrelevant. Pub. L. No. 107-200, 116 Stat. 735 (April 8, 2002). NEI, 373 F.3d at 1311. Indeed, the NEI court also made it clear that the substance of the EIS could be challenged during the NRC's licensing process and in connection with the DOE's transportation-related decisions. Id. at 1313-14.

Even assuming that Congress had not foreclosed a legal challenge to the Department's site selection process, the NRC's reasoning is fatally flawed. There is no legitimate reason to treat the relation between the Department and the NRC any differently than in other cases where two federal agencies are responsible for different aspects of the same project, or where one federal agency is applying for a permit or approval from another agency. Thus, the CEQ's Deputy General Counsel, in her comments on the NRC's Proposed Rule, pointedly stated:

"I disagree with this interpretation of the NWPA, and read the phrase 'to the extent practicable' to mean just that after looking at DOE's EIS and evaluating it, NRC should adopt some or all of it in order to avoid unnecessary duplication."

Letter from Lucinda Low Swartz to James R. Wolf of 9/20/88, available at http://www.lsnnet.gov/docview.aspx?mode=1&lsn=NRC000024546&ic=1&im=0&sc=1&sm=0 (emphasis in original).

Any doubt concerning this issue has been resolved by the D.C. Circuit in NEI. There, the court made it quite clear that it would not indulge the NRC's cramped interpretation of its NEPA obligations. In holding that "substantive claims against the [Repository] FEIS will not be fit for judicial review until the FEIS is used to support a concrete and final decision," NEI, 373 F.3d at 1313, the court relied on the statements made by counsel for DOE and NRC at oral argument, which indicated that "Nevada will be permitted to raise its substantive challenges to the FEIS in any NRC proceeding to decide whether to adopt the FEIS and in any DOE proceeding to select a transportation alternative." Id. Most significantly, in a post-argument submission, the NRC attempted to backpedal from its counsel's representations at oral argument, and referred the court to its "adoption" regulations for the proposition that the NRC may only review DOE's EIS based on new information or changes in the project. In response, the D.C. Circuit made it clear that it rejects such a narrow interpretation of the NRC's NEPA obligations. The court noted that (in keeping with NEPA) it would not be "practicable" for the NRC to adopt the FEIS unless it met the CEQ standards for an adequate EIS, and that the NWPA's mandate that the FEIS be adopted by NRC "to the extent practicable" is intended to avoid duplication of the environmental review process. Id. at 1314.

Contrary to the NRC's tortured interpretation of the statute, the court's ruling in NEI is fully consistent with the text of the NWPA, and the statute provides no support for the notion that the NRC's "adoption" proceedings need only consider project changes or new information. In the section of the NWPA addressing the EIS, the statute states:

"In any such statement prepared with respect to the repository to be constructed under this subtitle, the [NRC] need not consider the need for a repository, the time of initial availability of a repository, alternate sites to the Yucca Mountain site, or nongeologic alternatives to such site."

42 U.S.C. 10134(f)(6) (emphasis added). These limitations on the scope of the NRC's responsibilities set forth in subsection (f)(6) parallel the limitations placed on the scope of DOE's EIS set forth in subsection (a)(1)(D), which states that the Department "shall not be required in any such environmental impact statement to consider the need for a repository, the alternatives to geological disposal, or alternative sites to the Yucca Mountain site." 42 U.S.C. 100134 (a)(1)(D).

In the preamble to its Final Rule, the NRC dismissed the language in subsection (f)(6) as merely "an editorial measure, lacking substantive effect." 54 Fed. Reg. at 27867. The NRC said that this language was not mere "surplusage," however, because the NRC "may have an obligation to prepare a supplemental EIS where there are new considerations or new information." Id. In fact, the NRC's explanation of this provision makes no sense and is not supported by the language of the statute—and would, despite the NRC's contrary assertion, relegate the statutory language to mere surplusage, in violation of the rules of statutory construction.

The only sensible interpretation of subsection (f)(6) is that the NRC need not consider in its licensing proceeding the same issues that the Department is exempted from considering in its EIS. This interpretation is not only most consistent with NEPA, but it gives effect to the statutory language contained in subsection (f)(6). Indeed, the statute's use of the word "such" not only supports this interpretation, but conclusively defeats the NRC's interpretation. The word "such" clearly must refer to an existing EIS, not a hypothetical one to be completed at some later date by the NRC in light of new information or new developments. This interpretation is also bolstered by the language in subsection

(f)(4) referring to the NRC's adoption of the Department's EIS, which states that "[t]o the extent such statement is adopted by the [NRC], such adoption shall be deemed to also satisfy the responsibilities of the [NRC] under [NEPA]." 100134(f)(4). The use of "such" in both subsections must refer to the Department's EIS.

Moreover, the contrasting use of the past and future tenses in subsection (f)(6) also demonstrates that that Congress was referring to the scope of NRC's independent review of the Department's EIS. The statute states that in "any such statement prepared" (past tense), NRC "need not consider" (future tense) certain issues. Thus, subsection (f)(6) is not concerned with some new EIS that may be prepared in the future based on new developments or information; rather, it articulates the straightforward requirement that in making its independent evaluation whether to adopt the existing ("such") EIS, the NRC need not consider the issues that Congress exempted from DOE's consideration.

In short, under NEPA, the NWPA and applicable case law, the NRC must consider all environmental impacts, including those related to transportation, in reviewing the Department's application for a license to construct the Yucca Mountain repository. The confusing and disjointed way in which DOE has structured its environmental reviews may facilitate the NRC's efforts to avoid those obligations in the short run, but such efforts are doomed to failure in the long run, because they virtually ensure judicial reversal of any NRC decision to approve the DOE's license application.

Response

DOE has prepared documents that are fully consistent with the EPA and DOE implementing regulations for NEPA evaluations. The NRC will evaluate the DOE license application for Yucca Mountain in accordance with its requirements, policies, and procedures.

The Foreword to the Nevada Rail Corridor SEIS, the Rail Alignment EIS, and this Repository SEIS describes the relationship between the documents.

The Nevada Rail Corridor SEIS supplements the rail corridor analysis of the Yucca Mountain FEIS by analyzing the potential environmental impacts from constructing and operating a railroad in the Mina rail corridor. That SEIS analyzes the Mina rail corridor at a level of detail commensurate with that of the rail corridor analysis of the Yucca Mountain FEIS.

The Rail Alignment EIS tiers from the broader corridor analysis in both the Yucca Mountain FEIS and the Nevada Rail Corridor SEIS. It analyzes the potential impacts of constructing and operating a railroad along common segments and alternative segments in the Caliente and Mina rail corridors.

The Repository SEIS supplements the Yucca Mountain FEIS by analyzing the construction, operations, monitoring, and eventual closure of a repository at Yucca Mountain. It includes the potential environmental impacts of transporting spent nuclear fuel and high-level radioactive waste from 72 commercial and 4 DOE sites to Yucca Mountain. It also includes the impacts from constructing and operating a railroad along common segments and alternatives segments in the Caliente and Mina rail corridors. Therefore, DOE has not segmented the consideration of environmental impacts related to the Proposed Action to construct, operate, monitor, and eventually close a repository at Yucca Mountain.

1.3.3 (2843)

Comment - RRR000540 / 0007

The commenter stated that the NWPA requires specific steps and timing between completion of site characterization, site recommendation, and submittal of a license application. She also stated that DOE has not met those requirements.

Response

Thank you for your comment.

1.3.3 (1737)

Comment - RRR000525 / 0016

Having just passed the one-year anniversary of the date by which the EPA said it would publish its final revised radiation rule (40 CFR Part 197) for the repository to comply with court-ordered revisions, the repository program could be in suspense over what the final rule will require, even though the

SEIS incorporates the revisions from the draft rule. It seems to us that EPA's tardiness shows an unjustifiable indifference or lack of support to this important national project. We lament that Section 114(e)(2) of the NWPA seems to have been ignored: "Any Federal agency that determines it cannot comply with any deadline in the project decision schedule, or fails to so comply, shall submit to the Secretary [of Energy] and to the Congress a written report explaining the reason for its failure or expected failure to meet such deadline.. ." as well as other actions for the Secretary to take to advise Congress on the effects on the project decision schedule. It seems to us that the federal government collectively acts with indifference to the fact that owners of commercial spent fuel were required to enter into contracts with DOE which call for the owners to pay fees into the Nuclear Waste Fund and that DOE was to have begun waste acceptance for disposal in the repository starting in January 1998. In the meantime the owners continue to make their fee payments with little to show for it.

Response

Thank you for your comment.

1.3.3 (1860)

Comment - RRR000525 / 0004

We also understand the further purpose that the Repository SEIS might serve, to the extent practicable, for use by the Nuclear Regulatory Commission (NRC) in adopting the document for an EIS associated with the licensing action environmental impact documentation.

Response

Thank you for your comment.

1.3.3 (2813)

Comment - RRR000712 / 0016

The commenter stated that the safety of the repository could not be judged without an EPA compliance standard.

Response

In preparing the Repository SEIS, DOE considered the proposed EPA standard and conforming NRC rule to provide a perspective on the potential radiological impacts of the repository during the period of geologic stability (up to 1 million years). If the Repository SEIS analysis is inconsistent with any requirement of the final EPA or NRC standards, DOE will perform the required additional analysis. If the final standards do not require changes to the way DOE calculated repository performance, the results of the TSPA reported in the Repository SEIS could be compared to the final dose limits, as measured by whatever measure of compliance is selected and incorporated into the final standards.

DOE has continued to refine the TSPA model since it completed the 2002 Yucca Mountain FEIS. Although the TSPA analysis in the Repository SEIS reports different results from those reported in the FEIS, the differences are largely attributable to the requirements in the proposed EPA and NRC standards. The proposed standards establish for the first time requirements for calculating repository performance during the period of geologic stability, and require the use of more current health physics information than that specified in NRC's 2001 rule (see Chapter 5 of the SEIS). DOE used the same TSPA model in the License Application and the Repository SEIS to estimate potential radiological impacts during the period of geologic stability.

1.3.3 (2960)

Comment - RRR000655 / 0008

NRC regulations: The SEIS contains numerous references to NRC safeguards and security regulations (for example, section 11.2.4.5 on p. 11-9). The document also contains multiple variations on this theme: "DOE carefully follows U.S. Department of Transportation and NRC transportation rules now and will follow or exceed any others that might be established in the future, whether by Congress, the department of transportation, or NRC" (9-7, 11-8, 11-9, 11-10, H-2, elsewhere). These statements create the impression that DOE is obligated to follow all NRC regulations on safeguards and security. While the Midwest feels strongly that DOE should be obligated to follows these regulations, such is unfortunately not the case. To avoid confusing readers on this issue, DOE should make it clear that the NWPA requires the department to abide by the NRC's requirement for advance notification. DOE should openly acknowledge, however, that there is no enforcement mechanism for ensuring that DOE follows all other NRC regulations on shipment safeguards and security.

Also, section H.8 on p. H-19 refers to transportation safeguards and security being "among the highest DOE priorities as it plans for shipments ... to Yucca Mountain." The section goes on to say that "DOE would build the security program for the shipments on the successful security program it developed and has successfully used in past decades for shipments of spent nuclear fuel to DOE facilities from foreign and domestic reactors." Section H.10.1 on p. H-24 contains the exact same statements. What these sections fail to mention is that most of the shipments "in the past decades" were conducted before September 11, 2001. DOE needs to make sure it not only builds upon its past successes but also incorporates best practices from the post-9/11 era.

Page H-2 contains this statement: "NRC rules do not require notification of local authorities, which is the responsibility of the individual state governments." This quote makes it sound like the states are supposed to notify local government officials, which is not the case. The sentence should be revised to say "NRC rules do not require notification of local authorities, which is left to the discretion of the individual state governments." Also, on p. H-4, the SEIS states, "As required by Section 180 of the NWPA, all shipments to a repository would comply with NRC regulations on advance notification of

state and local governments." It would be a good idea to clarify that, despite the wording used in the NWPA, the NRC does not require notification of local governments.

In section H.4.8 on p. H-12, the SEIS says, "The NRC requires advance notice, en route status, and other pertinent shipping information on DOE shipments." This sentence is confusing. DOE needs to elaborate on this thought to indicate of whom the NRC requires such information, and who the intended recipients are.

Response

The NWPA [Section 180(b)] requires DOE to abide by the NRC regulations on advance notification of state and local governments before the transportation of spent nuclear fuel. The Department is subject to the enforcement provisions of the applicable NRC regulations.

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

DOE has modified the language on page H-2 to clarify the actual NRC requirement.

1.3.3 (3412)

Comment - RRR000583 / 0004

The commenter asserted than when it became evident that the Yucca Mountain Site could not meet the required safety standards, the standards were repeatedly lowered.

Response

Thank you for your comment.

1.3.3 (3541)

Comment - RRR000906 / 0001

The commenter stated that the Yucca Mountain Project is shaped by politics.

Response

Thank you for your comment.

1.3.3 (3713)

Comment - RRR000223 / 0004

The commenter stated that, based on experience with project budget overruns, extending schedules, and the lack of published lessons learned, the DOE environmental management systems should commit to improving or issuing new DOE Orders, specifications, or regulations for certain areas or activities.

Response

Thank you for your comment.

1.3.3 (3914)

Comment - RRR000737 / 0013

The commenter asserted that over the years, siting rules have evolved away and the EPA radiation protection standard has evolved into a much different regulation. He further asserted that as standards change, DOE looks for ways to adjust the dose calculations to show compliance.

Response

Thank you for your comment.

1.3.3 (3963)

Comment - RRR000671 / 0005

The CGTO knows that the EIS has omitted a section in the Nevada Revised Statutes Section related to Indian burials.

Response

Nevada Revised Statute 383 applies to (1) the creation and duties of the State Historic Preservation Office, (2) American Indian burials on state and private lands, and (3) State Historic Preservation Office relationships with other state agencies. It does not apply to federal lands or federal projects that do not involve private or state lands. The Yucca Mountain Repository site is federal land and not subject to Nevada Revised Statute 383. If, during the Yucca Mountain Project, DOE encountered American Indian burial sites on state or private lands as a result of repository-related actions, it would comply with Nevada Revised Statute 383.150 - 383.190, "Protection of Indian Burial Sites."

1.3.3 (4025)

Comment - RRR000995 / 0012

The commenter questioned whether affected states have been notified to prepare agreements with the Federal Railroad Administration in order to have authority over enforcement of federal railroad safety regulations.

Response

There is no requirement for states to seek authority over enforcement of federal railroad safety regulations. DOE has not notified any states to suggest this action.

1.3.3 (4082)

Comment - RRR000995 / 0020

The commenter suggested the need to clarify DOE's interactions with the International Atomic Energy Agency; including results of consultation and plans for complying with IAEA requirements and provisions.

Response

Thank you for your comment.

1.3.3 (4115)

Comment - RRR000369 / 0002

The commenter asserted that, based on original standards, the Yucca Mountain site is not suitable for all the waste that would be buried there and that the regulations have been manipulated to suit the site.

Response

Thank you for your comment.

1.4 Alternatives

1.4.1 Proposed Action

1.4.1 (49)

Comment - 7 comments summarized

Proposed Action and No-Action Alternative

DOE received a number of comments that suggested alternatives to the Proposed Action. The comments centered on (1) considering alternatives to using the TAD canister, and (2) considering alternatives to the No-Action Alternative analyzed in the Repository SEIS.

Commenters expressed concerns that the decision by DOE to use TAD canisters to transport (by rail), age, and dispose of commercial spent nuclear fuel has not been covered in any previous NEPA document. As a consequence, the decision by DOE to employ the TAD system was not made in compliance with the requirements of NEPA, and as such, the Repository SEIS must be expanded to provide NEPA analysis sufficient to support a decision by DOE to utilize the TAD system.

Commenters indicated that the proposal to use the TAD canister concept together with the repackaging of spent nuclear fuel at reactor sites is highly speculative and the analysis should include the comparative impacts and risks associated with using alternative canister systems (for example, existing dual purpose canisters) for transport to the repository in comparison with the proposed TAD system.

Other commenters expressed concerns that included the failure of DOE to take a hard look at why previous canister proposals were rejected 15 years ago, as well as lack of design information on the construction, maintenance, and durability of TAD canisters, including basic information such as what material will be used for the canisters and adequate quality assurance.

Commenters did not believe DOE fully analyzed all potential impacts of TAD canister use, including the effects of terrorists' attacks, human error in packaging, transportation, and handling of TAD canisters at the repository, and how DOE would "retrieve" TAD canisters for the 50-year retrieval period.

Additional alternatives, to the No-Action Alternative, should include mostly legal-weight truck and/or mostly overweight truck, and rail to truck intermodal dependent TAD-based repository systems. Commenters expressed the notion that neither of the scenarios for the No-Action Alternative are reasonable and therefore do not meet the requirements of NEPA, specifically that alternatives considered must be reasonable. Commenters continued that neither of the No-Action Alternatives fulfills the requirements of the NWPA and would breach the contracts between DOE and the spent fuel owners and result in the spent fuel remaining where it is indefinitely.

Commenters indicated that DOE limited the scope of the alternatives analyzed in the Repository SEIS to such a degree as to have limited its ability to comply with the Congressional directive to pursue development of the repository at Yucca Mountain.

Response

In the Yucca Mountain FEIS, DOE evaluated the receipt of commercial spent nuclear fuel under two packaging scenarios: mostly canistered, in which the Department would transport and receive most commercial spent nuclear fuel in dual-purpose canisters; and mostly uncanistered, in which it would transport and receive most commercial spent nuclear fuel uncanistered. In the mostly canistered scenario, DOE would open dual-purpose canisters at the repository and repackage the spent nuclear fuel in waste packages. In the mostly uncanistered scenario, the Department would transfer spent nuclear fuel from transportation casks to waste packages. In both scenarios, DOE would handle the fuel at the repository in an uncanistered condition before loading it into waste packages for emplacement. From a transportation standpoint, the primarily canistered approach in the Repository SEIS is not a significant departure from the approach in the FEIS. The implementation of TAD canisters would not measurably change the number of required transportation shipments. The TAD canister concept at the repository would simplify operations, thereby reducing health and safety impacts and potential for accidents. In any event, DOE could not use TAD canisters without NRC approval of the DOE proposal through the licensing proceeding.

The NWPA, as amended, directs DOE to evaluate geological disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain.

DOE disagrees that the No-Action Alternative in the Repository SEIS should be an analysis of the mostly legal-weight truck scenario, mostly overweight truck scenario, or rail-to-truck intermodal scenario because it evaluated these actions in the Yucca Mountain FEIS. In the FEIS, DOE analyzed two national transportation scenarios—mostly rail and mostly legal-weight truck. Based on the analyses in the FEIS, DOE made several decisions, as reflected in a Record of Decision, one of which was selection of the mostly rail scenario as the transportation mode on a national basis and in the State of Nevada (69 FR 18557, April 8, 2004). In the Record of Decision, DOE acknowledged that selection of the mostly rail scenario would require construction of a rail line in Nevada.

Because DOE, as lead agency, analyzed the mostly legal-weight truck scenario in the Yucca Mountain FEIS and did not select it as the preferred mode of transportation in its Record of Decision, the Department has already made a determination on this issue and, therefore, did not consider it in the Repository SEIS.

The NWPA directs DOE to evaluate geologic disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. DOE does not have authority to evaluate alternatives to geologic disposal.

Because DOE, as lead agency, analyzed the mostly legal-weight truck scenario in the Yucca Mountain FEIS and did not select it as the mode of transportation in its Record of Decision, it is an issue the Department has already decided and, therefore, excluded from further consideration in the Repository SEIS.

1.4.2 Section Not Used

1.4.3 Section Not Used

1.4.4 No-Action Alternative

1.4.4 (29)

Comment - 21 comments summarized

General Support for the No-Action Alternative

Commenters stated that spent nuclear fuel and high-level radioactive waste should remain where it is now stored, or that DOE should store and dispose of it in a manner that eliminates the need to transport it to a repository at Yucca Mountain. Many commenters support a No-Action Alternative that would keep spent nuclear fuel at the commercial reactor sites and in the states where spent nuclear fuel and high-level radioactive waste production occurs. Other commenters expressed the belief that technological advances in the future will enable better alternatives to a repository at Yucca Mountain and that radioactive waste should remain where it is until such technologies are available. Commenters suggested that requiring the commercial generators to store spent nuclear fuel on site would serve to stop production and force DOE and the utilities to find viable alternatives for energy production and safe disposal methods. Other commenters felt that leaving the material where it is would alleviate taxpayers from costs associated with the transportation and disposal of spent nuclear fuel and high-level radioactive waste.

Response

DOE acknowledges that onsite storage systems, such as spent nuclear fuel storage pools, have operated for several decades without undue risk to the general public or nuclear power plant personnel. Most of these systems are wet and, by design, active. Such storage systems require continuous technical and management oversight of process equipment (such as water-cooling, water treatment, and leak-detection systems). Some utilities have recently constructed dry storage facilities. While these facilities do not require active cooling systems, they must have routine monitoring to ensure consistency with regulatory environmental protection standards. In addition, the utilities must provide 24-hour security measures to safeguard the stored material.

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 to proceed with disposal if the site receives an NRC license. Although the NWPA does not direct DOE to examine continuing storage at existing sites, the Department included the No-Action Alternative in the Repository SEIS as a basis for comparison to the Proposed Action. If the Yucca Mountain Repository does not receive an NRC license, 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, which would include the need for any new legislative authority. Under any future course that included 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 DOE would consider in future recommendations, which include transportation requirements. However, the course that Congress, DOE, and the commercial utilities would take if Yucca Mountain did not receive approval for repository

development is uncertain. Chapter 7 of the Repository SEIS discusses the No-Action Alternative and contains estimates of potential environmental impacts of continued storage at the generator sites.

1.4.5 Cost of Proposed Action or No-Action Alternative

1.4.5 (30)

Comment - 5 comments summarized

Cost of the Proposed Action

Commenters stated that this project is very expensive, which includes the large expenditures required for upgraded highways and rail routes. Commenters noted that utilities and private industry did not have to shoulder the costs. Another commenter noted the way to keep the costs under control was to keep the overall project schedule moving forward.

Response

Commercial nuclear generating utilities would fund approximately 70 percent of the estimated repository-related costs through the Nuclear Waste Fund, which would cover costs associated with disposal of commercial spent nuclear fuel. Taxpayers would fund the remaining 30 percent, 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.

1.4.6 Alternatives Suggested by Commenters

1.4.6 (31)

Comment - 19 comments summarized

Alternatives Suggested by Commenters

Several commenters recommended broad alternatives to geologic disposal that included nuclear waste transmutation and nuclear waste recycling. A commenter suggested that DOE redirect the Yucca Mountain budget into research and technology.

Response

In the late 1970s, DOE evaluated many alternatives to geologic disposal of spent nuclear fuel and high-level radioactive waste and published its findings in October 1980 as part of the *Environmental Impact Statement on Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980, all).

While the NWPA does not require DOE to consider alternatives to geologic disposal, Congress did direct the Department to study accelerator transmutation of radioactive waste and to prepare a plan for development of that technology. DOE submitted the report, *A Roadmap for Developing Accelerator Transmutation of Waste (ATW) Technology* (DIRS 110625-DOE 1999, all), to Congress on November 1, 1999. DOE is evaluating transmutation and nuclear waste recycling in its Global Nuclear Energy Partnership.

1.4.7 Other Comments on Alternatives

1.5 Purpose and Need for Agency Action

1.6 Design and Performance

1.6.1 Spent Nuclear Fuel and High-Level Radioactive Waste Inventory

1.6.1 (67)

Comment - 17 comments summarized

Spent Nuclear Fuel and High-Level Radioactive Waste Inventory

Several commenters objected to increasing the proposed Yucca Mountain disposal inventory to more than 70,000 metric tons. Another commenter believes it is DOE's plan to seek approval for disposal of double that amount. Another commenter noted the increase to 130,000 metric tons uranium (MTU) in Inventory Modules 1 and 2. DOE should provide an explicit statement that Congress would need to amend the *Nuclear Waste Policy Act* (NWPA) to permit disposal of more than 70,000 MTU. The Draft Repository SEIS fails to provide a layout to show how the repository could accommodate 130,000 MTU nor does it provide site information to show this increased volume is acceptable. The Draft SEIS does not discuss the potential for a new generation of commercial reactors to generate additional spent fuel that would require disposal. These factors seem to indicate that DOE believes the capacity to expand the repository is essentially unlimited, without any basis. DOE needs to determine and document a safe disposal capacity for Yucca Mountain and document it in the analysis of cumulative impacts. Congress has not approved disposal of Greater-than-Class-C waste and DOE Special-Performance-Assessment-Required waste and DOE should not include it as part of Module 2.

Response

Federal agencies are required to evaluate the cumulative impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Therefore, the Yucca Mountain FEIS and the Repository SEIS evaluate the impacts of the potential disposal of additional inventories of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. Chapter 8, Cumulative Impacts, of the Repository SEIS describes these impacts, and acknowledges the need for legislative action by Congress before such actions could occur. In addition, DOE has included the potential implications of GNEP on repository operations in Chapter 8 of the Repository SEIS and discusses them at the beginning of this CRD.

The NWPA limits the disposal to no more than 70,000 metric tons of heavy metal (MTHM) for the amount of spent nuclear fuel and high-level radioactive waste that DOE could dispose of in a first repository until such time a second repository is licensed; the Proposed Action for the Repository SEIS reflects this amount in the inventory DOE analyzed. This amount will not change without further legislative action by Congress.

If the statutory limit of 70,000 MTHM of spent nuclear fuel and high-level radioactive waste were lifted by Congress, DOE would have to obtain an amendment to its license from the NRC to permit possession of the increased amounts of spent nuclear fuel and high level waste. DOE used a scaling methodology in

the Repository SEIS to analyze the potential environmental impacts that could occur from the transportation and disposal of the additional inventory modules.

Inventory Module 2 includes Greater-Than-Class-C low-level radioactive wastes that could require future geologic disposal. Module 2 would require Congressional action because waste levels would exceed the statutory limit of 70,000 MTHM. DOE is preparing the Disposal of Greater-Than-Class-C EIS (DOE/EIS-0375). The Yucca Mountain Repository is one alternative being considered.

1.6.2 Transportation (National & Nevada)

1.6.2 (5)

Comment - 2 comments summarized

Fossil-Fuel Use and Contribution to Global Warming

Commenters expressed concern about the amount of fossil fuel necessary to transport spent nuclear fuel and high-level radioactive waste, pollution that would be generated from the use of this amount of fossil fuel, and the contribution to global warming.

Response

Chapter 6, Section 6.3.6 was added to the Repository SEIS to discuss global climate change and emissions of carbon dioxide, a greenhouse gas, from transportation. Annually, the maximum total emissions of carbon dioxide associated with transportation would add 41,000 to 42,000 tons to national carbon dioxide emissions of 6.7 billion tons.

1.6.2 (44)

Comment - 10 comments summarized

Analysis of California to Nevada Shipments Inadequate

Commenters stated that the analysis of shipments of spent nuclear fuel and high-level radioactive waste from California to Nevada was incomplete or inadequate.

Response

Appendix G, Table G-25 lists the potential environmental impacts in California for shipments of spent nuclear fuel and high-level radioactive waste. In addition, Figure G-6 shows the representative routes that could be used in California. These environmental impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. Therefore, the analysis of potential impacts in California was neither incomplete nor inadequate.

1.6.2 (51)

Comment - 23 comments summarized

Overweight Trucks

Commenters stated that the DOE contention that nonrail shipments would have to use overweight trucks was unsubstantiated and not analyzed, or that DOE could have to use overweight trucks for shipments that were not by rail.

Response

DOE has updated Chapter 6, Section 6.1.6 of the Repository SEIS to include additional information and illustrations of legal-weight, overweight, and heavy-haul trucks. This additional information includes a discussion of the results of a study of overweight trucks conducted by DOE. In this study, overweight trucks were defined as trucks that exceeded the gross vehicle weight limit of 80,000 pounds, but weighed less than 96,000 pounds, followed axle and axle group weight limits adopted by the *Surface Transportation Assistance Act of 1982*, conformed to dimensional restrictions to operate on most major highways, and complied with the Federal Bridge Formula (which relates to the number of axles, axle and axle group spacing and the weight carried on axles and axle groups).

1.6.2 (52)

Comment - 8 comments summarized

Representative Transportation Routes

Commenters wanted the Repository SEIS to identify the routes DOE would use for shipments of spent nuclear fuel and high-level radioactive waste, or objected to the use of representative routes to estimate transportation impacts. Other commenters stated the belief that there would be far more shipments on specific routes than DOE analyzed in the SEIS.

Response

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. Appendix G, Section G.2 of the SEIS discusses these factors.

DOE also conducted two sensitivity analyses related to routing. The first sensitivity analysis examined alternative rail routes to the repository and the second sensitivity analysis examined alternative highway routes used to access the repository. The results of these sensitivity analyses are in Appendix A, Sections A.3 and A.6 of the Repository SEIS, and show that there would be very little change in the national transportation impacts based on using alternative rail or truck routes.

1.6.2 (62)

Comment - 8 comments summarized

Use of California Route 127

Commenters expressed specific opposition to the use of California State Route 127 for shipments of spent nuclear fuel and high-level radioactive waste.

Response

The representative truck routes that DOE presented in the Repository SEIS follow U.S. Department of Transportation routing regulations (49 CFR 397, Part D) for Highway Route-Controlled Quantities of radioactive material, which limit shipments to preferred routes such as Interstate Highways and bypasses

and beltways around cities. DOE would not use State Route 127 unless the State of California designated it as an alternate preferred route.

In the Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3), DOE provided a sensitivity analysis for alternative highway routes to access the repository associated with the mostly legal-weight truck alternative. This sensitivity analysis included California State Route 127. DOE has included this sensitivity analysis in Appendix A, Section A.6 of the Repository SEIS to provide a perspective on this issue. On a national level, the sensitivity analysis found that the choice of highway routes to access the repository has very little impact on the total impacts of transporting spent nuclear fuel and high-level radioactive waste.

1.6.2 (164)

Comment - 4 comments summarized

Analyze Intermodal Transportation

The Draft Repository SEIS does not mention DOE's Supplemental Analysis issued March 10, 2004, which effectively modified the Yucca Mountain FEIS by evaluating a legal-weight truck/rail intermodal scenario of transportation nationwide and in Nevada for the first 6 years and possibly longer. Intermodal by its very nature involves significant loading, unloading, transfer, and interline transportation activities that the FEIS finds would give rise to increased impacts and risks to the environment, worker safety, and general public health and safety.

The Draft EISs should have evaluated, in the same level of detail as the Proposed Action, alternatives that involve proposed intermodal operations/scenarios, including (1) heavy-haul truck transport of large rail casks from an identified intermodal facility, and (2) legal-weight truck [LWT] shipments of LWT casks off-loaded from rail cars at the intermodal facility. The discussion of intermodal scenarios and the assessment of intermodal impacts should have encompassed the various operational scenarios posited by DOE, including (1) intermodal operations for some period until a rail line direct to Yucca Mountain can be constructed, (2) intermodal operations in lieu of a Yucca Mountain rail spur, and (3) concurrent and/or overlapping direct rail and intermodal operations.

The newly proposed intermodal transportation scenario required the Draft EISs to take a "good hard look" and conduct a "reasoned analysis" of the environmental impacts of legal-weight truck/rail intermodal transportation nationwide and in Nevada—something that has not been done in the FEIS or the Supplemental Analysis context.

Response

DOE plans for the rail line to be available before shipments of spent nuclear fuel and high-level waste began. If the rail line were not available, DOE would develop contingency plans before shipments begin, including any further NEPA analysis as appropriate.

1.6.2 (253)

Comment - RRR000321 / 0001

The commenter noted that his comments address the transportation aspects of the EIS and that DOE still does not have a comprehensive plan for safe transportation of spent nuclear fuel and high-level nuclear waste to the proposed repository.

Response

Appendix H, Section H.4, of the Repository SEIS discusses the transportation planning process. DOE has adopted as policy the practices that were developed in consultation with stakeholders and are outlined in DOE Manual 460.2-1 (DIRS 171934-DOE 2002, all). The Manual establishes 14 standard transportation practices for Departmental programs to use in the planning and execution of shipments of radioactive materials including radioactive waste. It provides a standardized process and framework for planning and for interacting with state and tribal authorities and transportation contractors and carriers.

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Section H.4.

1.6.2 (715)

Comment - RRR000484 / 0004

Two of the problems that need to be addressed are that it is uncertain that a rail line can be constructed to the site and that there are unresolved problems with truck transport of containers of the size and weight that will be required.

Response

Based on the analyses in the Rail Alignment EIS, DOE could construct a railroad to the Yucca Mountain Site for either the Caliente or Mina rail alignment.

DOE has updated Chapter 6, Section 6.1.6 of the Repository SEIS to include additional information and illustrations of legal-weight, overweight, and heavy-haul trucks. This additional information includes a discussion of the results of a study of overweight trucks conducted by DOE. In this study, overweight trucks were defined as trucks that exceeded the gross vehicle weight limit of 80,000 pounds, but weighed less than 96,000 pounds, followed axle and axle group weight limits adopted by the *Surface Transportation Assistance Act of 1982*, conformed to dimensional restrictions to operate on most major highways, and complied with the Federal Bridge Formula (which relates to the number of axles, axle and axle group spacing and the weight carried on axles and axle groups).

1.6.2 (1177)

Comment - RRR000663 / 0053

The Draft EIS should specify the ratio of rail use to heavy truck use and delineate the procedures for the intermodal transfers of waste, locations, needed safety measures and routes.

Response

About 20 percent of rail casks would be shipped to nearby railheads using heavy-haul trucks. The other items requested by the commenter for inclusion in the SEIS more properly belong in the National Transportation Plan, the Transportation Operations Plan, or individual site plans.

1.6.2 (1363)

Comment - RRR000617 / 0246

In order to fully disclose potential environmental impacts, the analysis of each route considered in the EIS must compare potential effects along the Union Pacific main lines necessitated by the selection of any given route. For example, the proposed Mina and Caliente corridors would connect to existing Union Pacific railroad tracks in different locations and on different Union Pacific lines, and would thus affect existing rail corridors and adjacent land uses differently. A Caliente corridor route would utilize the Union Pacific main line that runs from Salt Lake City, Utah through southern Nevada (including Las Vegas) to southern California, while the Mina Route would connect to different Union Pacific main line tracks located in northern Nevada. This northern rail line links central California with Salt Lake City, and passes through Reno, Nevada. Amtrak also provides passenger service on the route through northern Nevada.

The October 2007 NEPA documents do not consider the potential impacts along the UP [Union Pacific] mainline necessitated by the selection of the Caliente or Mina corridor. In terms of impact assessment, the documents only provide detailed analysis of the regions in which the new rail spur will be constructed. The documents do not address impacts associated with shipping spent nuclear fuel or high-level waste on a Union Pacific mainline.

Response

DOE evaluated the existing rail corridors from California or Salt Lake City to the Hazen Siding and then to Yucca Mountain, and from California or Salt Lake City to Caliente and then to Yucca Mountain, as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. This included the AMTRAK route from Salt Lake City to Reno across northern Nevada.

Appendix G of the Repository SEIS contains maps of transportation routes and state-level transportation impacts in California, Utah, and Nevada. In addition, Appendix G lists the number of shipments through California, Utah, and Nevada.

1.6.2 (1364)

Comment - RRR000617 / 0247

A decision by DOE to utilize either the Caliente or Mina route absent the analysis of the effects of their companion segments of the Union Pacific mainline (based on actual or likely railroad operations) could result in unanticipated and/or unmitigated impacts of transporting spent nuclear fuel and other high-level radioactive waste to Yucca Mountain. The potential environmental impacts of transporting waste on lines shared by passenger service must also be analyzed.

The October 2007 NEPA documents do not address this topic.

Response

DOE evaluated the existing rail corridors from California or Salt Lake City to the Hazen Siding and then to Yucca Mountain, and from California or Salt Lake City to Caliente and then to Yucca Mountain, as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. This included the AMTRAK route from Salt Lake City to Reno across northern Nevada.

Appendix G of the Repository SEIS contains maps of transportation routes and state-level transportation impacts in California, Utah, and Nevada. In addition, Appendix G lists the number of shipments through California, Utah, and Nevada.

1.6.2 (1365)

Comment - RRR000617 / 0248

In the Repository FEIS and other documents, the DOE has artificially divided the analysis of potential transportation impacts between "National Transportation Impacts" and "Nevada Transportation Impacts." While this division makes some sense because the repository and any new rail line would be located within the state of Nevada, ... limiting the evaluation of each rail corridor to the state of Nevada may obscure potential differences between alternatives due to the different existing rail line that would be used. In order to fully disclose the differences between alternatives, the study area of each alternative should be expanded along the corresponding existing rail line, east to Utah and west to California, if appropriate.

The analysis of the proposed alternatives in the documents is not expanded to include, along the existing rail line, west into California and east into Utah. [T]he detailed analysis does not extend beyond the area in which a new rail line and associated facilities would be constructed. See DOE/EIS-0250F-S1D, Volume II, Section G.11 for a limited discussion of state specific impacts.

Response

DOE evaluated the existing rail corridors from California or Salt Lake City to the Hazen Siding and then to Yucca Mountain, and from California or Salt Lake City to Caliente and then to Yucca Mountain, as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. This included the AMTRAK route from Salt Lake City to Reno across northern Nevada.

Appendix G of the Repository SEIS contains maps of transportation routes and state-level transportation impacts in California, Utah, and Nevada. In addition, Appendix G lists the number of shipments through California, Utah, and Nevada.

1.6.2 (1395)

Comment - RRR000656 / 0021

This section says, "the public stated that DOE should avoid rail corridors in the Las Vegas vicinity."

DOE has mistakenly taken the concerns of the public in Nevada as applying to DOE'S defined rail corridors. The concern is more likely that shipments of SNF and HLW should not go through Las Vegas or vicinity. DOE should directly address the number of shipments that are projected to go through Las Vegas for each corridor alternative by virtue of its rail corridor selection decision. Whether or not the shipments are on new track in a "corridor" or on existing track on the main line is irrelevant and DOE has not addressed this issue.

Response

Based on the representative transportation routing presented in Appendix G of the Repository SEIS, 2,650 truck casks and 755 rail casks would be shipped through Las Vegas.

1.6.2 (1449)

Comment - RRR000867 / 0005

The policy of rail shipments to be made on dedicated trains should apply to shipments of naval spent nuclear fuel as well. Why would the policy of dedicated trains not apply to naval spent nuclear fuel?

Response

The Naval Nuclear Propulsion Program is responsible for all shipments of naval spent nuclear fuel, including shipments to Yucca Mountain. Because safety and security differences between dedicated train and regular freight train service are not significant, operational considerations generally prevail in the selection. The Naval Nuclear Propulsion Program would review all considerations before it made a final decision on the type of freight service for Yucca Mountain shipments, but is not committing to dedicated train service at this time.

1.6.2 (1627)

Comment - RRR000690 / 0003

There is the absence of a contingency plan for reliance on final EISs in the event the TAD system or rail alignment proposals are rejected.

Response

If DOE did not implement TAD canisters, the impacts of shipping spent nuclear fuel and high-level radioactive waste by rail would be similar to those for the mostly rail scenario in the Yucca Mountain FEIS. If DOE did not select a rail alignment in the Caliente or Mina Corridor, the future course it would pursue to meet its obligations under the *Nuclear Waste Policy Act* is unclear at this time. DOE recognizes that other possibilities could be pursued, including evaluating the other three rail corridors to determine an alignment for the construction and operation of a rail line to transport spent nuclear fuel and high-level radioactive waste to the repository at Yucca Mountain; these possibilities were analyzed in the Yucca Mountain EIS and in the Nevada Rail Corridor SEIS. Further consideration of these possibilities may require additional NEPA reviews, as appropriate.

1.6.2 (1822)

Comment - RRR000622 / 0005

The commenter stated that some of the transportation described in the SEIS would be unacceptably risky or impossible. The examples cited included: (1) from the Humboldt Bay reactor in California on heavy-haul trucks over about 150 miles of rugged mountainous roads to a rail line; and (2) fuel from the Indian Point reactor in New York, about 56 miles down the Hudson River past Manhattan, to be loaded on rail cars in New Jersey. The commenter stated that more analyses are necessary to understand the safety implications. She also stated that, because of the weight of the TAD canisters, DOE should examine the national transportation infrastructure, including rail lines, bridges, and roads, and consider existing and future conditions.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and

programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by the DOE, NRC, U.S. Department of Transportation, the International Atomic Energy Agency, and others in the international community support the Repository SEIS analytical results.

The transportation of rail casks from generator sites not serviced by railroads could be achieved by transporting rail casks to a rail head by either heavy-haul truck or barge. Both methods were evaluated in the Yucca Mountain FEIS. The Draft SEIS evaluated only heavy-haul truck since the relative environmental impacts of heavy-haul trucks and barge would be similar. As the schedule for these shipments grows closer, the logistics associated with the selection of heavy-haul truck or barge shipment will be further evaluated.

1.6.2 (1897)

Comment - RRR000525 / 0012

In the case of commercial sites that do not have the ability to load out large capacity rail shipping casks, presumably TADs or dual-purpose dry casks, the transportation plan presented in the SEIS is to ship the material to the repository in overweight trucks. Yet, sites that could load the rail shipping casks but lacked rail access at the origin point could use heavy-haul trucks or barges to ship the fuel to the nearest rail line. We recognize that there will be ample time to plan and coordinate the details of each shipment with the owners of the fuel in each case, but there are other stakeholders, such as the

State radioactive materials transportation officials that DOE is working with in the transportation planning process, who will want to know mode and routing plans in their respective jurisdictions. We expect that the public will prefer that more of the waste be transported by rail to the fullest extent and that use of heavy-haul and overweight trucks be minimized.

Response

DOE based the transportation analysis in the Repository SEIS on using heavy-haul trucks to transport rail casks to a nearby rail head for sites that do not have direct rail access in order to increase the use of rail transportation.

1.6.2 (1934)

Comment - RRR000677 / 0010

The SEIS discusses the impacts of spent nuclear fuel and high-level waste shipments from 72 commercial sites and four DOE sites. SEIS at 6-11. But the SEIS acknowledges that spent fuel is currently stored at 121 sites. SEIS at 1-1, fn 1. Apparently, waste at some 45 sites will first be shipped to one of the four DOE sites, where the waste will then be shipped to Yucca Mountain.

If the waste is sent to either the Idaho Engineering Laboratory or to the DOE Hanford, Washington site, then a high proportion of all shipments will travel through Utah twice: once on the way to the DOE Idaho and Washington sites and a second time when the waste is shipped from those sites to Yucca Mountain.

Shipments of waste to DOE sites are incidental to the disposal of spent nuclear fuel [spent nuclear fuel] and HLNW [high-level nuclear waste] at Yucca Mountain. Therefore, the final EIS analysis should include shipping routes and modes of shipments, as well as a break down of the risks and consequences of waste shipments from 45 separate locations to each of the four DOE sites.

Response

DOE manages spent nuclear fuel from its defense production reactors, U.S. Navy reactors, and DOE test and experimental reactors, and fuel from university and other research reactors, commercial reactor fuel DOE acquired for research and development, and fuel from foreign research reactors. The impacts of transporting this spent nuclear fuel to the Idaho National Laboratory in Idaho and the Savannah River Site in South Carolina were evaluated in the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995, all), and are included in the assessment of cumulative impacts Chapter 8, Section 8.4.1.5, of the Repository SEIS.

1.6.2 (1959)

Comment - RRR000525 / 0022

We have some questions and suggestions related to implementation of the repository once licensed that we have raised in our comments. There are many questions about waste acceptance plans and transportation that we urge DOE to pursue with parties directly involved, primarily the owners of spent fuel which have "paid in advance" for a service that was to have been provided beginning over ten years ago and has not yet been performed. We appreciate that there are sensitive matters that are in litigation, but it is our view that DOE needs to develop detailed waste acceptance and transportation plans for each of the owners of spent fuel at the active and inactive reactors at 72 locations detailed in this SEIS. Moreover, DOE, which has done a commendable job of working with State radioactive materials transportation and safety officials on conceptual transportation planning, now needs to refine that planning into preliminary shipment plans for each originating point and share that planning with appropriate State officials.

Response

Appendix H, Section H.4, of the Repository SEIS discusses the transportation planning process. DOE has adopted as policy the practices that were developed in consultation with stakeholders and are outlined in DOE Manual 460.2-1 (DIRS 171934-DOE 2002, all). The Manual establishes 14 standard transportation practices for Departmental programs to use in the planning and execution of shipments of radioactive materials including radioactive waste. It provides a standardized process and framework for planning and for interacting with state and tribal authorities and transportation contractors and carriers.

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4.

1.6.2 (2148)

Comment - RRR000550 / 0004

South Carolina will ship its stored waste to Yucca Mountain—what about Washington state?

Response

Appendix G, Table G-10, of the Repository SEIS lists the shipments that would be made from each generator site to the repository. There would be three truck shipments and 265 rail shipments from generator sites in the State of Washington to the repository.

1.6.2 (2162)

Comment - RRR000522 / 0009

Absent from the Repository DSEIS is a re-analysis of the environmental costs and benefits of mostly rail versus mostly truck modal alternatives. DOE's 2002 Yucca Mountain FEIS was based upon significantly fewer numbers of truck shipments (1,100 versus 2,700 in the Repository DSEIS) resulting from use of the mostly rail mode. An analysis should be included in the Repository DSEIS which either validates or suggests changing DOE's previous decision to utilize a mostly rail modal choice.

By default, the Proposed Action in the Repository DSEIS includes shipment by legal or overweight truck of approximately 2,700 casks. However, the analysis of impacts to most resources in Section 6.4 of the Repository DEIS is limited to the region of influence for the Caliente and Mina rail alignments. Appendix J of the Yucca Mountain FEIS included public health and safety impacts for a variety of alternative highway transportation routes through Nevada. A similar comparative analysis, reflecting the greatly increased number of truck shipments is not provided in the Repository DSEIS. Consequently, it is not possible to discern which of many possible highway routes through Nevada poses the least amount of impacts under the 2,700 truck cask Proposed Action scenario. The Repository FSEIS must include a comparative analysis, reflecting the greatly increased number of truck shipments, and the impacts of using various highway routes in Nevada on various potentially impacted resources, particularly socioeconomics. White Pine County believes the Repository FSEIS must at least disclose the possible social, economic and fiscal impacts and the incident-free and accident public health risks of transporting up to 2,700 truck casks of spent nuclear fuel MLW over a fifty-year period through the County (DOE has failed to address these issues in Section 6.4.1.10 and Section 6.4.1.11 of the Repository DSEIS, respectively).

Response

The objective of the Repository SEIS is to supplement the Yucca Mountain FEIS. DOE is not revisiting its decision to use mostly rail transport.

DOE evaluated the impacts of alternative truck routes in the Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3) and has added a summary of that analysis to Appendix A, Section A.6 of the Repository SEIS. The State of Nevada has not designated truck routes through White Pine County as alternate preferred routes, and a comparative analysis is not justified until such a designation occurs.

1.6.2 (2467)

Comment - RRR000664 / 0038

The evaluation of alternative highway routes is inadequate, incomplete, and relies on numerous questionable assumptions. The most likely alternative highway route (the NDOT 'B' route from I-80 to US 93 to US 6 to US 95) is not analyzed at all. And the primary route (Interstate Highway 15 to US 95) assumes infrastructure (the I-215 beltway) that may not be useable given uncertainties over its status as part of the interstate highway system, and ignores the current HM 164 route (Interstate Highway 15 connecting directly with US 95 in Las Vegas).

Response

DOE has added Section A.6 to the Repository SEIS to include a sensitivity analysis of alternative highway routes, including the Nevada Department of Transportation "B" route and the route using Interstate Highway 15 connecting directly to U.S. Highway 95. The results of the sensitivity analysis

show that there would be little difference in the transportation impacts among the various routing alternatives.

1.6.2 (2657)

Comment - RRR000661 / 0005

We believe that DOE's NEPA documents for the proposed repository should be revised to include a comprehensive national transportation plan for repository shipments that reflects the essential elements of the transportation program identified in the Western Governors' policy recommendations for spent fuel and high-level waste transport.

Response

Appendix H, Section H.4, of the Repository SEIS discusses the transportation planning process. DOE has adopted as policy the practices that were developed in consultation with stakeholders and are outlined in DOE Manual 460.2-1 (DIRS 171934-DOE 2002, all). The Manual establishes 14 standard transportation practices for Departmental programs to use in the planning and execution of shipments of radioactive materials including radioactive waste. It provides a standardized process and framework for planning and for interacting with state and tribal authorities and transportation contractors and carriers.

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Section H.4.

1.6.2 (2664)

Comment - RRR000661 / 0007

The proposed modal mix for cross-country transportation includes "measurable goals and targets" with which we do not concur. Specifically, we do not concur with the measurable objective that spent fuel from seven specified commercial site origins would be shipped cross-country (2,646 shipments) by overweight truck (Appendix G, Tables G-8 and G-10; Figures G-3 through G-47). However, the Draft EIS does not assess the impacts of overweight trucks on highways and communities across the country through which such shipments would pass. Nor are the potential uncertainties and obstacles associated with a national overweight truck shipping campaign assessed, including states' permit requirements for such shipment and logistical and operational uncertainties. We recommend that DOE reexamine these elements of its proposed action, with the objective that overweight trucks be used only for shipment to nearby railroads, generally within the origin state. We then further recommend that DOE identify the programs, procedures and controls by which it intends to accomplish this objective.

The Draft EIS does not adequately examine the impacts that would inevitably be associated with implementing the proposed action, especially impacts resulting from the proposed use of TAD canisters. For example, many utility companies have already moved spent fuel into sealed canisters placed in dry storage, and many more will have done so before TAD canisters become available or waste can be moved to a repository. The Draft EIS does not adequately evaluate the feasibility, impacts (including worker health and exposure impacts), costs, and risks of repackaging such spent fuel into TAD canisters at the generator sites. The information in the Draft EIS does not support the achievability of the goal of transporting 90 percent of the spent fuel by rail using the TAD canister system.

Response

The Repository SEIS considered the impacts of using overweight trucks to transport spent nuclear fuel to the repository (see Section 6.1.6).

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

Repackaging fuel at the reactor sites is not part of the DOE's Proposed Action. The proposal for design and licensing of the Yucca Mountain Repository is that 90 percent of commercial spent nuclear fuel would arrive in TAD canisters. The License Application addresses receipt of 10 percent of commercial spent nuclear fuel uncanistered or in dual-purpose canisters. Appendix A of the SEIS also addressed the potential that only 75 percent of commercial spent nuclear fuel could be placed in TAD canisters.

1.6.2 (2806)

Comment - RRR000661 / 0013

The Repository SEIS states that "DOE would operate the repository following a primarily canistered fuel approach in which the majority (a goal of 90 percent) of commercial spent fuel would be packaged at the generator sites in TAD canisters." (Section 2.1: Proposed Action; page 2-7) This results in a set of representative routes in which 68 commercial site origins would ship cross-country by rail (Table G-4 & 5). Of these, 22 origins would use heavy-haul to deliver rail casks to a nearby rail yard. (Table G-7) Fifteen of the 22 have a barge shipment origin. (Table G-21) Only 7 commercial plant sites would ship cross-country by (overweight) truck. (Table G-8)

The WIEB HLW Committee supports the use of dedicated trains for repository SNF [spent nuclear fuel] and HLW [high-level radioactive waste] shipments. The Final SEIS should specify a detailed plan for using dedicated trains that includes: a) Agreements with utilities regarding the waste pick up slots (that is, the queue) to facilitate the make-up of dedicated trains at origin sites or nearby rail yards; b) Technology (development and/or application) or other measures to address cask loading constraints at some reactors; c) Site-by-site arrangements for delivery of rail casks from origins lacking direct rail access to nearby rail yards; d) logistical and operational arrangements demonstrating how spent fuel from different origins would be combined and how and where trains would be formed for cross-country shipments. The "National Transportation Plan" should detail how the origin-specific modes for cross-country transport will be achieved.

In combination, the proposed modal mix and its implementing action plan should provide a basis for the assessment of routes across the West from the 62 commercial site origins in eastern states (including the Cooper Station and Fort Calhoun reactors in eastern Nebraska). Our review suggests the following results of the proposed action:

Truck transport of SNF and HLW (in overweight trucks) across the West would be substantially reduced.

The number of entry points (rail and truck) into the western region would be limited, thus limiting the number of routes affected. Those routes would be heavily affected, but, with lead time and federal cooperation, the state/local needs could be assessed and provided, thus preparing a limited number of routes more adequately for a 25+ year national transportation campaign.

Response

The details requested by the commenter for inclusion in the SEIS would be included in the National Transportation Plan, the Transportation Operations Plan, or individual site plans.

1.6.2 (2868)

Comment - RRR000721 / 0008

The commenter stated that DOE has not properly analyzed truck transportation risk in Nevada or elsewhere along transportation routes.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.6.2 (2906)

Comment - RRR000655 / 0010

Routing: The Midwestern states were very concerned to see that, as with the 2002 FEIS, the draft SEIS fails to address regional equity and instead would have the vast majority of shipments from Southern reactors passing through the Midwest—principally through Illinois and Missouri. The SEIS explains the constraints DOE used when generating the routes in TRAGIS. The states would like to know what specific constraint causes TRAGIS to "select" these Midwestern-bound routes instead of heading straight west. We doubt there is any efficiency to be gained, for example, by having shipments from the South

head due north for hundreds of miles into Ohio, only to wind up heading south again to get to Yucca Mountain.

While it is understandable for DOE to want to "give priority to the use of rail lines that ... are the best maintained and have the highest quality track," can there be any contribution to safety or security by giving "priority to originating railroads" (p. 6-4)? If not, then DOE should refrain from following this practice. Also, did DOE give any consideration [to] reducing worker exposure by choosing routes that would minimize en route inspections? Do the estimated impacts even consider the worker exposure in states like Illinois that require en route inspections of all shipments? Do these required inspections have any impact on the transit times and, therefore, the selection of particular routes? Also, the SEIS indicates that TRAGIS attempts to "identify the shortest" route (p. G-5)—shortest by what measure? Does that mean distance or time? If time, does it consider the stop in Illinois and other states for en route inspections?

With regard to truck routes, on p. G-6, the SEIS explains that, in TRAGIS, the "default rules yield highway routes that commercial motor carriers of freight would be expected to use." What exactly does this mean?

In section H.4.2, the SEIS says "DOE is performing and would perform the [route identification] work through a Topic Group of the Transportation External Coordination Working Group, which would seek broader public input and collect comments on routing criteria and the process for development of a set of routes" (H-10). It is not the Topic Group's plan or its responsibility to seek public input. DOE should correct this statement.

Response

DOE used the TRAGIS computer program (DIRS 181276-Johnson and Michelhaugh 2003, all) to generate the representative routes analyzed in the Repository SEIS. 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2. Regional equity, transit time, or the number of inspections was not among the factors used to generate the representative rail routes.

In response to the comment, DOE has revised Appendix H, Section H.4.2.

1.6.2 (3015)

Comment - RRR000120 / 0003

The commenter asked what DOE is planning to do to repair the dilapidated railroad infrastructure and asked if DOE has budgeted for equipment and training for first responders. The commenter also asked if DOE has considered that the weight of the cask and truck would exceed the 80,000-pound limit on roads in California and throughout the United States. Finally, the commenter asked if DOE had evaluated California State Route 127 north from Baker to Nevada.

Response

DOE disagrees that the current rail infrastructure is dilapidated. Rather, railroad safety has continued to improve over the years. For example, in its *Overview of America's Freight Railroads* (DIRS

185501-AAR 2008, p. 6), the Association of American Railroads commented that "from 1980 to 2006, railroads reduced their overall train accident rate by 68 percent and their rate of employee casualties by 81 percent. Preliminary data indicate that safety improvements continue in 2007."

Section 180(c) of the *Nuclear Waste Policy Act* requires DOE to provide technical assistance and funds to states and American Indian tribes to train public safety officials of appropriate units of local government through whose jurisdictions it would transport spent nuclear fuel or high-level radioactive waste. Section 180(c) mandates that training must cover procedures for safe routine and emergency response procedures. It encompasses all modes of transportation, and funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials to prepare for repository shipments through their jurisdictions.

DOE has updated Chapter 6, Section 6.1.6 of the SEIS to include additional information and illustrations of legal-weight, overweight, and heavy-haul trucks. This additional information includes a discussion of the results of a study of overweight trucks conducted by DOE. In this study, overweight trucks were defined as trucks that exceeded the gross vehicle weight limit of 80,000 pounds, but weighed less than 96,000 pounds, followed axle and axle group weight limits adopted by the *Surface Transportation Assistance Act of 1982*, conformed to dimensional restrictions to operate on most major highways, and complied with the Federal Bridge Formula (which relates to the number of axles, axle and axle group spacing and the weight carried on axles and axle groups).

In the Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3), DOE provided a sensitivity analysis for alternative highway routes to access the repository associated with the mostly legal-weight truck alternative. This sensitivity analysis included California State Route 127. DOE has included this sensitivity analysis in Appendix A, Section A.6 of the Repository SEIS to provide a perspective on this issue. On a national level, the sensitivity analysis found that the choice of highway routes to access the repository has very little impact on the total impacts of transporting spent nuclear fuel and high-level radioactive waste.

1.6.2 (3095)

Comment - RRR000995 / 0024

Throughout the whole transportation provisions, there is no mention that additional rail lines would be [built] nationwide. However, by comparing the nationwide maps provided pertaining to both the Caliente and Mina corridor, listed below are the discrepancies:

1. Reference to the Caliente rail corridor (Figures A-I and G-I):
   (a) Is an [additional] rail line being proposed from Fort Calhoun, IA to Denver, CO? (See Figures A-I and G-I)
   (b) Is an additional rail line being proposed from MO going west and north of Wolf Creek, KS to Denver, CO? (See Figures A-I and G-I)
2. Reference to the Mina rail corridor (Figures A-2 and G-2):
   (a) Is an additional rail line being proposed from MO going west north of Wolf Creek, KS to Denver, CO? (See Figures A-2 and G-2)
   (b) Is an additional rail line being proposed from Comanche Peak, TX, going north, then through NM and AZ connecting to the CA rail line? (See Figures A-2, G-2 and G-40)?

(c) Are two (2) additional rail lines being proposed to run south at OR and connect to the rail line in CA? (See Figures A-2, G-2 and G-35)

(d) Is an additional rail line being proposed north from San Onofre, CA to connect to the main rail line in CA? (See Figures A-2 and A-I)

(e) Is the main rail line in CA proposed to be extended so it run to the southern tip of Nevada connecting CA? (See Figure A-2)

Response

The rail lines referred to in this comment are existing rail lines, or are heavy-haul truck routes on existing roads from generator sites to nearby rail heads. DOE does not anticipate that additional rail lines outside Nevada would need to be built to accommodate the shipments.

1.6.2 (3100)

Comment - RRR000995 / 0025

The commenter suggested the need to clarify shipping details under the scenario where civilian research reactor spent nuclear fuel would be shipped directly to the repository. He asked if the material would go by rail or truck, how would the material be prepared for shipment (type of canister, etc.).

Response

Spent nuclear fuel from civilian research reactors would not be shipped directly to the repository. Rather, this spent nuclear fuel would be shipped to the Idaho National Laboratory and the Savannah River Site in South Carolina. The impacts of these shipments were evaluated in the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DIRS 101802-DOE 1995, all), and are included in the assessment of cumulative impacts in Chapter 8, Section 8.4.1.5, of the Repository SEIS.

1.6.2 (3402)

Comment - RRR000235 / 0005

The commenter noted that if waste was transported by truck over U.S. Highway 95 in Esmeralda County, it would create impacts without economic gain. He also noted the EIS should also address DOE investments in infrastructure improvements.

Response

The representative truck routes that DOE presented in the Repository SEIS follow U.S. Department of Transportation routing regulations (49 CFR 397, Part D) for highway-route-controlled quantities of radioactive material, which limit shipments to preferred routes such as Interstate Highways and bypasses and beltways around cities. DOE does not intend to use U.S. Highway 95 through Esmeralda County unless the State of Nevada designates it as an alternate preferred route.

As described in Chapter 4, Section 4.3.1.1, of the Repository SEIS, DOE would build several new roads and replace several existing roads, which would total about 40 kilometers (25 miles) of new and replacement paved roads. DOE would first build a new 13.7 kilometer (8.5-mile) two-lane paved access road from a point 3.7 kilometers (2.3 miles) north of Gate 510 on the Nevada Test Site to a point about 0.8 kilometer (0.5 mile) east of Fortymile Wash. Second, the Department would build a new 2.1-kilometer (1.3-mile) two-lane paved road to the crest of Yucca Mountain. DOE would move the existing

access road to Gate 510 approximately 0.39 kilometer (0.24 mile) to the southeast to line up with the State Route 373 and U.S. Highway 95 intersection.

1.6.2 (3648)

Comment - RRR000373 / 0005

The commenter stated that DOE should include specific information for its schedule to store and remove spent nuclear waste at the reactor sites and the transport of that waste to the disposal site.

Response

Shipment campaign operational planning could begin only after qualifying utilities submitted Delivery Commitment Schedules (10 CFR Part 961, Appendix C), at least 63 months before delivery of spent nuclear fuel to DOE. The shipment plans DOE would then prepare would identify such information as shipment dates; selected spent nuclear fuel; shipping sites; involved transportation carriers; routes; points of contact at shipping sites and in state, tribal, and local governments; necessary transportation equipment; notifications; and other details that the Department would have to address before a successful shipment could begin.

1.6.2 (3743)

Comment - RRR000666 / 0004

If high-level radioactive waste is transported by truck over U.S. highway 95 in Esmeralda County it will create impacts without economic gain. The final EIS should address future Department of Energy investments in highway and infrastructure improvements.

Response

The representative truck routes that DOE presented in the Repository SEIS follow U.S. Department of Transportation routing regulations (49 CFR 397, Part D) for highway-route-controlled quantities of radioactive material, which limit shipments to preferred routes such as Interstate Highways and bypasses and beltways around cities. DOE does not intend to use U.S. Highway 95 through Esmeralda County unless the State of Nevada designates it as an alternate preferred route.

Chapter 4, Section 4.3.1.1, of the Repository SEIS discusses transportation infrastructure improvements. DOE would build several new roads and replace several existing roads, which would total about 40 kilometers (25 miles) of new and replacement paved roads. DOE would first build a new 13.7-kilometer (8.5-mile) two-lane paved access road from a point 3.7 kilometers (2.3 miles) north of Gate 510 on the Nevada Test Site to a point about 0.8 kilometer (0.5 mile) east of Fortymile Wash. Second, the Department would build a new 2.1-kilometer (1.3-mile) two-lane paved road to the crest of Yucca Mountain. DOE would move the existing access road to Gate 510 approximately 0.39 kilometer (0.24 mile) to the southeast to line up with the State Route 373 and U.S. Highway 95 intersection.

1.6.2 (4077)

Comment - RRR000995 / 0017

The commenter suggested the need to clarify when and where DOE would use overweight trucks and/or barges. In addition, the Department should clearly identify the impacts of this mode of transportation.

Response

DOE would ship spent nuclear fuel by truck to the repository if the generator site did not have the capability to handle a rail cask. Barging would be most advantageous for moving spent nuclear fuel to a nearby railhead for generator sites without direct rail access but with barge access.

DOE evaluated barge shipments in Appendix J, Section J.2.4 of the Yucca Mountain FEIS. This analysis found that the impacts of using barges would be similar to the impacts of using heavy-haul trucks to move spent nuclear fuel from generator sites to nearby railheads. DOE also evaluated barging in Appendix G, Section G.10.10 of the Repository SEIS. This analysis found that the impacts of barging would be similar to the estimated impacts in the FEIS.

Table G-8 in the Repository SEIS lists generator sites that DOE assumed would use trucks for shipments to the repository. Table G-21 lists generator sites the Department evaluated for barge shipping.

1.6.2.1 Opposition to Transporting Spent Nuclear Fuel and High-Level Radioactive Waste

1.6.2.1 (61)

Comment - 45 comments summarized

General Opposition to Transportation

Commenters stated their opposition to the transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain by rail, heavy-haul truck, or legal-weight truck. Many comments did not specify reasons for the opposition or were very broad in scope. Examples included opposition to specific transport modes such as legal-weight or overweight trucks, rail, heavy-haul trucks, or barges; the use of routes through specific neighborhoods, cities, heavily populated areas, specific states, and other areas such as national parks; or the proximity of potential routes to specific structures and areas such as private residences, schools, hospitals, lakes, rivers, and American Indian tribal lands.

Other commenters were opposed because of the potential for impacts to the environment and ecosystem; impacts to tourism; the condition of the transportation infrastructure generally or at specific locations; and impacts from natural disasters.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International

Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.6.2.2 Number of Shipments

1.6.2.2 (1714)

Comment - RRR000620 / 0011

Additional information on industry capabilities that DOE should consider regarding expectations for the relative number of truck vs. rail shipments.

In evaluating transportation impacts, DOE appears to have overestimated the number of used fuel shipments that will travel to Yucca Mountain by truck and underestimated the number of rail shipments. A partial review of industry infrastructure indicates that there are at least a half dozen plants that are shown in Table G-10 as requiring truck shipments that either have made, or are planning to make facility upgrades that will provide capability to ship by rail. Many of these sites are planning to load dual purpose canisters that must be shipped by rail. DOE should not presume that truck shipments will be coming from sites that have already committed to loading rail casks. The operators of these sites have no intention to reload used fuel and, after the plants are shut down, will have no capability to do so. Industry would be happy to provide this information to DOE and is interested in working with DOE to assure that the most up to date information on likely shipment modes is considered in finalizing this DSEIS.

Response

DOE based the information on generator sites that would ship by truck and by rail on the latest *Facility Interface Data Survey* (DIRS 175677-Gillespie 2005, all). However, over time, the capability of generator sites to ship by truck and by rail may change. Based on the impacts described in the Yucca Mountain FEIS, if the number of truck shipments decreased, the corresponding transportation impacts would also decrease.

1.6.2.2 (1886)

Comment - RRR000479 / 0003

The commenter expressed a concern that planned nuclear waste shipments to Yucca Mountain for just 1 year would outnumber all such shipments over the past three decades in the United States.

Response

The number of shipments to Yucca Mountain would vary annually but could be up to 200. In comparison, there have been about 3,000 spent nuclear fuel shipments over the past 30 years in the United States.

1.6.2.2 (2772)

Comment - RRR000523 / 0010

DOE needs to discuss the potential access points for shipments not using rail. The overall level of truck shipments appears low given the number of sites that actually have rail service.

Response

Generator sites that could not ship spent nuclear fuel directly to the repository in rail casks would ship it in truck casks in overweight or legal-weight trucks. For these shipments, the access point would be a

nearby Interstate Highway. A generator site could ship spent nuclear fuel to the repository in rail casks and by using heavy-haul trucks to move the casks to a nearby rail head. For these shipments, the access point would be the rail head. Table G-7 of the Repository SEIS lists the distances from such generator sites to nearby rail heads.

1.6.2.2 (2837)

Comment - RRR000655 / 0013

Shipment numbers: Is it valid to assume that each train leaving a site will carry three fully loaded casks (G-34)? Although the states support this type of configuration as a way to reduce the total number of shipments and increase the efficiency of DOE's transportation system, it will be necessary for DOE to successfully renegotiate its contracts with the utilities in order to make this possible. The SEIS should assess the impacts of a more realistic system that is constrained by the requirements of the existing standard contracts and shipping queue. While it may be realistic to assume that utilities will fill each cask, the limitations of the current queuing system make it unrealistic to assume they will fill three casks in a given year.

With regard to Cook nuclear plant in Michigan, changing the mode from rail to truck triples the number of shipments that will affect the state (p. G-96). What is the reason for the change?

While the draft SEIS contains much information on the inventories of spent fuel and high-level waste, the total numbers of casks, shipments numbers, and potential state specific impacts, it does so in a manner that is incomplete and confusing. Stakeholders need to be able to review the raw data that DOE used to derive its estimate of the impacts. For example, the Midwest would like to have tables showing the impacted population within each state, or to have an idea of which routes are attributable to which plants. Appendix G is supposed to contain the information to support DOE's estimates of the impacts, but this information is not presented in a way that makes it clear how DOE used the information to reach its conclusions.

Response

The impacts of transporting spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository that DOE describes in the Repository SEIS are for transportation activities that would begin many years in the future and would continue for up to 50 years. As a consequence, DOE had to make assumptions about the characteristics of future transportation systems and activities to analyze and estimate the impacts. DOE selected data and assumptions for this purpose that would provide reasonable and realistic representations of transportation systems and operations and lead to conservative estimates of the impacts that would result.

Therefore, for example, to analyze impacts DOE made assumptions about the number of cask cars that a dedicated train would transport. Because it cannot know years in advance exactly how many cask cars each train would transport, DOE used averages or representative values to represent shipments. It used assumptions about the average number of cars in a train that it considered reasonable and realistic based on considerations of the logistics of loading shipping casks, preparing casks for shipment, loading casks onto rail cars, and positioning shipments for pickup by a railroad. The averages differed for shipments that would originate at DOE sites from those for shipments that would originate at commercial nuclear sites because DOE's assumptions differed on logistics for the two types of sites.

For nuclear plants in Michigan, 768 truck shipments would be from the Cook plant, and 132 rail shipments would be from the Big Rock Point, Palisades, and Fermi plants. There was no change of transportation mode for the Cook nuclear plant.

The maps in Appendix G show routes from each plant.

1.6.2.2 (2985)

Comment - RRR000661 / 0016

Applying the 90 percent by rail objective, the SEIS projects the shipment of 6490 rail casks containing TADs and 307 rail casks containing other canisters in 2289 dedicated trains from 68 commercial plant sites. (Section G.4, Table G-10). At each commercial site, the number of casks per dedicated train is assumed to be 3. For DOE sites, the SEIS projects the shipment of 2698 rail casks (non-TAD canisters) in 544 dedicated trains, assuming roughly 5 casks per train from each origin.

The basis for the assumption of 3 casks per dedicated train shipment is not explained or justified. If intended as a "conservative assumption," we recommend that DOE set a higher (and measurable) target or goal. Note that 572 cross-country dedicated train shipments could be eliminated should DOE, (in cooperation with utilities and rail carriers), be able to ship 4 casks per train rather than 3.

Response

The impacts of transporting spent nuclear fuel and high-level radioactive waste to the Yucca Mountain repository that are described in the Repository SEIS are for transportation activities that would begin many years in the future and would continue for up to 50 years. As a consequence, DOE had to make assumptions about the characteristics of future transportation systems and activities to analyze and estimate the impacts. DOE selected data and assumptions would provide reasonable and realistic representations of the transportation systems and operations and at the same time lead to conservative estimates of the impacts that would result.

Therefore, for example, to analyze impacts DOE made assumptions about the number of cask cars that a dedicated train would transport. Because it cannot know years in advance exactly how many cask cars each train would transport, DOE used averages or representative values to represent shipments. It used assumptions about the average number of cars in a train that it considered reasonable and realistic based on considerations of the logistics of loading shipping casks, preparing casks for shipment, loading casks onto rail cars, and positioning shipments for pickup by a railroad. The averages differed for shipments that would originate at DOE sites from those for shipments that would originate at commercial nuclear sites because the DOE assumptions for analyzing impacts differed on logistics for the two types of sites.

1.6.2.3 Rail Transportation

1.6.2.4 Other Modes of Transportation

1.6.2.5 Transportation Operations Policy and Procedures

1.6.2.5 (141)

Comment - 4 comments summarized

Security

A commenter indicated that the Repository SEIS needs more information on state escorts. In addition, in Appendix H, Section H.6.2, the SEIS states, "[w]hile spent nuclear fuel and high-level radioactive waste shipments are in transit, state, local, and tribal governments could provide security for a radiological transportation incident that occurred on public lands." What does this statement mean? Will state and law enforcement officers be denied access to rail accidents that occur on privately owned tracks? DOE needs to clarify this statement.

Another commenter noted that the Repository SEIS states, "armed security escorts would accompany all shipments." Dedicated train shipments would include "one to two escort cars" (page 2-45), and DOE would provide escorts in all areas "urban, suburban, and rural" (page 6-3). The SEIS notes the reduction in radiation exposure to escorts (per ton shipped) by inclusion of more railcars in dedicated trains (page 6-3).

The SEIS does not describe the roles of escorts in dedicated train and overweight truck shipments. These could include roles in security, monitoring (radiological and mechanical), notification, or first emergency response. These roles (and the associated equipment, training, employment arrangements, and accountability standards) could have implications for state and local needs related to cross-country transport of spent nuclear fuel and high-level radioactive waste. Perhaps through the National Transportation Plan, DOE should more fully describe the intended roles and capabilities of dedicated train and overweight truck escorts, thereby providing a basis for route-specific needs assessment and planning.

The Draft SEIS (page 6-3) provides no basis for assuming that additional escorts would be sufficient to protect shipments from the current design-basis threat for nuclear sabotage, let alone future revisions to the design-basis threat over the duration of repository preclosure operations (50 years).

Finally, a commenter suggested that trains be in radio contact with crossings. Trains should have full-time monitoring and personnel that could scan the train exteriors.

Response

DOE would implement a program for in-transit security that meets or exceeds the requirements in the regulations of the U.S. Nuclear Regulatory Commission (NRC) in 10 CFR Part 73. The NRC regulations specify the following roles and qualifications for persons (including state police escorts) who escort shipments of spent nuclear fuel:

- Detect and assess attempts to gain unauthorized access to, or control over, spent nuclear fuel shipments;
- Notify appropriate response forces of any spent nuclear fuel shipment sabotage attempts;

- Impede attempts at radiological sabotage on spent nuclear fuel shipments in heavily populated areas or attempts to move such shipments illicitly into heavily populated areas until response forces arrive.

- On detection of the abnormal presence of unauthorized persons, vehicles, or vessels near a spent nuclear fuel shipment or of a deliberately induced situation that has the potential to damage a spent nuclear fuel shipment:

  - Determine if a threat exists;

  - Assess the extent of the threat, if any;

  - Inform local law enforcement agencies of the threat and request assistance; and

  - Implement procedures to cope with circumstances that threaten deliberate damage to a spent nuclear fuel shipment and with other safeguards emergencies.

- Maintain a written log for each spent nuclear fuel shipment, including information that describes the shipment and significant events that occurred during the shipment;

- Maintain visual surveillance by at least one escort of the shipment during periods when the shipment vehicle is stopped, or the shipment vessel is docked. For rail shipments, station at least one escort at a location on the train that will permit observation of the shipment car while in motion.

- Call the communications center at least every 2 hours to advise on the status of the shipment for road and rail shipments, and for sea shipments while shipment vessels are docked at U.S. ports.

- Ensure that the shipment is unloaded from a vessel only as authorized.

- Complete a training program. The subjects to be included are:

  - Security In Route; Route planning and selection; Vehicle operation; Procedures at stops; Detours and use of alternate routes

  - Communications; Equipment operation; Status reporting; Contacts with law enforcement units; Communications discipline; Procedures for reporting incidents

  - Radiological Considerations; Description of the radioactive cargo; Function and characteristics of the shipping casks; Radiation hazards; Federal, state, and local ordinances on the shipment of radioactive materials; Responsible agencies

  - Response to Contingencies; Accidents; Severe weather conditions; Vehicle breakdown; Communications problems; Radioactive spills; Use of special equipment (flares, emergency

lighting, etc.); Reporting; Calling for assistance; Use of immobilization features; Hostage situations; Avoiding suspicious situations

- Complete a weapons training and qualifications program.

Federal, state, and local statutes establish the jurisdictional authority of state and local public safety and law enforcement officials on private property, such as the property of a railroad company. The Department, as an agency of the Executive Branch of the Federal Government, has authority to limit access to its shipments if such action is necessary to ensure the security of classified information, materials, equipment, or facilities; to provide for national security or defense; or to provide for the safety of the general public.

DOE's responsibilities for responding to accidents involving its shipments are discussed in Appendix H. Further, as discussed in Section H.10.1 of Appendix H of the SEIS in response to a finding of the National Academy of Sciences report *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), DOE is working closely with other federal agencies including the NRC, the U.S. Department of Homeland Security, and the Transportation Security Agency to understand and eliminate potential threats to repository shipments. In addition to its domestic efforts, the Department is a member of the International Working Group on Sabotage for Transport and Storage Casks, which is investigating the consequences of a potential act of sabotage and is exploring opportunities to enhance the physical protection of casks. As a result of these efforts, DOE would modify its methods and systems as appropriate between now and the time of shipments.

1.6.2.5 (142)

Comment - 2 comments summarized

Transportation Plan

A commenter indicated that the Draft Repository SEIS does not address issues posed by the current waste acceptance schedule that is governed by the Standard Contracts DOE has with utility companies. The waste acceptance queue (the specified order in which DOE would receive spent nuclear fuel from utilities) poses considerable challenges for a national transportation system in terms of logistics and risk management (that is, the desirability of shipping oldest fuel first).

The commenter stated the belief that DOE must look to the highly successful Waste Isolation Pilot Plant transportation program for guidance in the performance of a spent nuclear fuel and high-level radioactive waste shipping campaign to a repository or interim storage facility. Further, the commenter insisted that DOE make no shipments of spent nuclear fuel or high-level radioactive waste to a repository or storage facility until it and the nuclear utility companies had worked with corridor states to implement an acceptable transportation plan for shipping the waste and until there was cooperative identification of shipping routes and funds and assistance to states at least 3 years before the start of shipments.

Another commenter stated that the Repository SEIS should define transportation plans and routes nationwide.

Response

DOE would implement a program for in-transit security that meets or exceeds the requirements in the regulations of the U.S. Nuclear Regulatory Commission (NRC) in 10 CFR Part 73. The NRC regulations

specify the following roles and qualifications for persons (including state police escorts) who escort shipments of spent nuclear fuel:

- Detect and assess attempts to gain unauthorized access to, or control over, spent nuclear fuel shipments;
- Notify appropriate response forces of any spent nuclear fuel shipment sabotage attempts;
- Impede attempts at radiological sabotage on spent nuclear fuel shipments in heavily populated areas or attempts to move such shipments illicitly into heavily populated areas until response forces arrive.
- On detection of the abnormal presence of unauthorized persons, vehicles, or vessels near a spent nuclear fuel shipment or of a deliberately induced situation that has the potential to damage a spent nuclear fuel shipment:
  - Determine if a threat exists;
  - Assess the extent of the threat, if any;
  - Inform local law enforcement agencies of the threat and request assistance; and
  - Implement procedures to cope with circumstances that threaten deliberate damage to a spent nuclear fuel shipment and with other safeguards emergencies.
- Maintain a written log for each spent nuclear fuel shipment, including information that describes the shipment and significant events that occurred during the shipment;
- Maintain visual surveillance by at least one escort of the shipment during periods when the shipment vehicle is stopped, or the shipment vessel is docked. For rail shipments, station at least one escort at a location on the train that will permit observation of the shipment car while in motion.
- Call the communications center at least every 2 hours to advise on the status of the shipment for road and rail shipments, and for sea shipments while shipment vessels are docked at U.S. ports.
- Ensure that the shipment is unloaded from a vessel only as authorized.
- Complete a training program. The subjects to be included are:
  - Security In Route; Route planning and selection; Vehicle operation; Procedures at stops; Detours and use of alternate routes
  - Communications; Equipment operation; Status reporting; Contacts with law enforcement units; Communications discipline; Procedures for reporting incidents

- Radiological Considerations; Description of the radioactive cargo; Function and characteristics of the shipping casks; Radiation hazards; Federal, state, and local ordinances on the shipment of radioactive materials; Responsible agencies

- Response to Contingencies; Accidents; Severe weather conditions; Vehicle breakdown; Communications problems; Radioactive spills; Use of special equipment (flares, emergency lighting, etc.); Reporting; Calling for assistance; Use of immobilization features; Hostage situations; Avoiding suspicious situations

- Complete a weapons training and qualifications program.

Federal, state, and local statutes establish the jurisdictional authority of state and local public safety and law enforcement officials on private property, such as the property of a railroad company. The Department, as an agency of the Executive Branch of the Federal Government, has authority to limit access to its shipments if such action is necessary to ensure the security of classified information, materials, equipment, or facilities; to provide for national security or defense; or to provide for the safety of the general public.

DOE's responsibilities for responding to accidents involving its shipments are discussed in Appendix H. Further, as discussed in Section H.10.1 of Appendix H of the SEIS in response to a finding of the National Academy of Sciences report *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), DOE is working closely with other federal agencies including the NRC, the U.S. Department of Homeland Security, and the Transportation Security Agency to understand and eliminate potential threats to repository shipments. In addition to its domestic efforts, the Department is a member of the International Working Group on Sabotage for Transport and Storage Casks, which is investigating the consequences of a potential act of sabotage and is exploring opportunities to enhance the physical protection of casks. As a result of these efforts, DOE would modify its methods and systems as appropriate between now and the time of shipments.

1.6.2.5 (143)

Comment - 3 comments summarized

Tracking and Notification

A commenter suggested that DOE provide advanced warning of intended travel routes so landowners could make the necessary adjustment to humans and stock animals.

Another commenter suggested that DOE inform all communities along transportation routes.

Finally, a commenter suggested the need to clarify whether existing or future regulations would require DOE to notify tribal authorities of shipments.

Response

DOE has specific policies and practices to ensure the safe and secure transportation of spent nuclear fuel and other highly radioactive materials. As discussed in Appendix H, Section H.4 of the Repository SEIS, these policies and practices are in the DOE Radioactive Materials Transportation Practices Manual [DOE M 460.2-1 (DIRS 171934-DOE 2002, all)]. The practices in this manual for ensuring the security of shipments limit communication of shipment information to persons with a need to know, which include

state, tribal and local officials through whose jurisdictions shipments of spent nuclear fuel and high-level radioactive waste would travel.

1.6.2.5 (144)

Comment - 4 comments summarized

Rail Safety

A commenter suggested that a separate train that would continuously evaluate track safety immediately precede all rail shipments and report back to the train that was carrying radioactive material in case it discovered any issues. Another commenter stated that DOE should maintain the rail line in compliance with federal regulations.

Another commenter asked what DOE is going to do to repair the dilapidated state of the rail infrastructure, particularly in California; what would the cost be, and who would bear that cost?

A commenter reported that the railroad has changed its maintenance agreement with the Surface Transportation Board to a 30-year period to change ties when it had changed 40 percent of the ties every 7 years. The commenter noted that in eastern Nevada, the rail system has slow orders, which means trains cannot go faster than 25 miles per hours because it is not safe to do so for more than 30 miles. The commenter suggested that short cars can physically hold up to the rigors of transporting heavy casks while a long car needs more spread of the track to negotiate a curve. However, there is not sufficient support by the track for short cars. The commenter also stated that the Federal Railroad Administration Interchange Standards, which require certain procedures on railcars for braking systems, is being violated. Therefore, new standards would be subject to the same lack of enforcement.

Response

Requiring a separate train that continuously evaluated track safety to precede trains that transported shipments of spent nuclear fuel or high-level radioactive waste would be unprecedented and unwarranted. DOE does not agree with the commenter's statement that railroads in California are in a dilapidated condition. Further, in its *Overview of America's Freight Railroads* (DIRS 185501-AAR 2008, p. 6), the Association of American Railroads commented that "from 1980 to 2006, railroads reduced their overall train accident rate by 68 percent and their rate of employee casualties by 81 percent. Preliminary data indicate that safety improvements continue in 2007."

Because of a high degree of public awareness and concern about the safety and integrity of spent nuclear fuel and high-level radioactive waste shipments by rail, the U.S. Department of Transportation Federal Railroad Administration issued its *Safety Compliance Oversight Plan for Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel* (DIRS 156703-U.S. Department of Transportation 1998, all). This plan establishes the policy to address the safety of rail shipments of spent nuclear fuel and high-level radioactive waste. It provides for the Federal Railroad Administration to:

- Continue its existing policy for routine track and signal system inspections
- Have a track geometry car operate over the selected rail route
- Implement its Bridge Inspection Policy to ensure inspection of bridges along the routes for structural soundness

- Review the carrier's rail flaw detection vehicle data to ensure integrity of the rail along the selected route

DOE anticipates that, regardless of the measures it takes or improvements in railroad safety that might occur, accidents could occur over the course of almost 3,000 rail shipments of spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository. However, it is extremely unlikely that such an accident would be severe enough to cause a release of radioactive material from a shipping cask. Numerous tests, demonstrations, and studies have shown that shipping casks that are designed, manufactured, tested, certified, and operated to be consistent with the rigorous standards of the NRC are robust and provide a high level of public safety when in use to transport spent nuclear fuel. The NRC would certify the casks DOE would use for shipments to Yucca Mountain.

Chapter 6 of the Repository SEIS contains the DOE analysis of impacts of transporting spent nuclear fuel and high-level radioactive waste to the repository. The Department based the analysis on the assumption that commercial railroads would transport spent nuclear fuel and high-level radioactive waste and, including the use of dedicated trains, transport would comply with their usual operating practices and would use existing railroad infrastructure. The results of the analysis showed that risks to public health and safety would be small. The results included conservative estimates of accident impacts and considered the consequences of unlikely severe accidents that could occur during transportation.

1.6.2.5 (155)

Comment - 3 comments summarized

HLW and Naval Shipments Versus SNF Shipments

Commenters asked for the following clarifications:

Would all measures that apply to commercial spent nuclear fuel shipments apply to shipments of naval spent nuclear fuel? DOE needs to clarify in the Repository SEIS and other documents that address transportation if naval spent nuclear fuel would be subject to different requirements.

Would all measures that apply to spent nuclear fuel shipments apply to high-level radioactive waste shipments? The Repository SEIS should explain any differences between the requirements or procedures DOE would follow for shipments of these different materials.

Response

As indicated in the Repository SEIS, DOE would conduct high-level radioactive waste and naval spent nuclear fuel shipments in accordance with all relevant laws and regulations, including NRC licensing of shipping casks. As with commercial spent nuclear fuel shipments, the Department would conduct high-level radioactive waste and naval spent nuclear fuel shipments to be consistent with practices developed in consultation with stakeholders and outlined in DOE Manual 460.2-1.

1.6.2.5 (163)

Comment - 8 comments summarized

SNF Hazards/Risks

A commenter stated that the Draft Repository SEIS barely acknowledges that spent nuclear fuel is dangerous. It provides no useful information on the surface dose rate of design-basis fuel. The State of Nevada's analyses of the DOE representative pressurized-water reactor spent nuclear fuel (4.2-percent

initial enrichment, burnup of 50,000 MWDt/MTHM, 10-year cooling time) estimate a contact surface dose rate in excess of 35,000 rem per hour, capable of producing an unshielded lethal exposure in 1 to 2 minutes.

Considering current industry trends toward higher initial enrichments and higher burnups, the spent nuclear fuel characteristics that DOE assumed in the Draft Repository SEIS are no longer representative or bounding for the time when shipments to Yucca Mountain could begin, about 2017 to 2020. Moreover, DOE has abandoned its original plan of shipping the oldest fuel first, and could now ship fuel cooled less than 10 years under certain circumstances. Under the SEIS Proposed Action, DOE could ship much hotter spent nuclear fuel (burnup of 60,000 to 70,000 MWDt/MTHM, 5-year cooling time). The Draft SEIS does not evaluate the impacts of shipping such fuel.

If the Yucca Mountain Project proceeded, the radiological characteristics of commercial spent nuclear fuel would largely determine the hazards from repository transportation. These characteristics would be the primary driver of risks and impacts from the loading and unloading of shipping casks, routine transportation activities, transportation accidents, and acts of terrorism or sabotage against repository shipments. The Draft Repository SEIS does not adequately address the relationship between the radiological characteristics of spent nuclear fuel at the time of shipment and the resulting transportation impacts.

Commenters pointed out that the radioactivity of a fuel assembly diminishes over time and that shipping older rather than younger fuel assemblies (that is, keep the fuel on site) would reduce the risk of normal and accident radiation exposure. A commenter stated that the State of Nevada (and the National Academy of Sciences and the Government Accountability Office) has urged DOE to return to its original plan of shipping the oldest fuel first. Under this approach, not only would the public along the transportation route be at less risk of radiological exposure, but DOE would have a better idea of how to handle thermal management at the repository. Moreover, there would be a diminished need to use aging pads—a concept that is on a shaky legal footing.

A commenter stated that DOE could ship spent nuclear fuel safely but there are things that can make it safer. DOE should return to its original policy of shipping oldest fuel first, which would require the Department to work with the utilities through the Standard Contract. A commenter stated that DOE does a disservice to itself and to the nuclear industry by not having a clearer up-front description of spent nuclear fuel and its radiological hazard.

Other commenters stated that shipping waste packages “too thermally hot for emplacement” would be an unnecessary risk to the public along the transportation routes, workers at plants, and drivers. A commenter stated that waste packages that were too thermally hot for emplacement should not be on public rails or roadways.

One commenter provided several points on the danger of spent nuclear fuel and high-level radioactive waste. The first is that DOE does not talk about the radiological characteristics of the spent nuclear fuel that would make up 90 percent of what it would ship to Yucca Mountain. Spent nuclear fuel is lethal. It is lethal when it comes out of the reactor. It is lethal for at least 100 years after cooling. Lethal means the gamma radiation field around it is so strong that an unshielded exposure is sufficient to give a dose of radiation that would cause death from radiation sickness in 1 to 2 minutes, even after the fuel has been cooled for 10 years; and even after 50 years of cooling, in a matter of 4 or 5 or 6 minutes, it could give a lethal exposure. That is the first measure of its danger.

A second measure is the fission products in the spent nuclear fuel, particularly strontium-90 and cesium-137. Many people in Nevada have thought about the environmental and human health effects of fission products because of the atomic weapons testing programs. While it is not the best measure to compare the products of civilian spent nuclear fuel to weapons, there is almost no other way to give a sense of what is in the shipping casks.

Commenters looked at the design-basis fuel DOE plans to ship. By commenter calculations, each truck cask would contain between 300 and 400 curies of cesium and strontium. That is 20 to 30 times the amount of those fission products that came from the Hiroshima bomb. The standard measure for a 20-kiloton nuclear weapon is about 4,000 curies of cesium-137.

Even the smaller truck casks would have an enormous inventory of very dangerous radiation. The much larger rail casks would contain even more. If the dedicated trains hauled three or four casks, as the DOE documents describe, there would be an enormous amount of cesium-137 in each train, equivalent to the largest single environmental release that occurred from the Chernobyl reactor accident, which released somewhere in the neighborhood of 2.5 to 3 million curies of cesium-137. That amount of cesium-137 would be on each one of these trains.

The State of Nevada has advised DOE over the years on shipping the oldest fuel first, because if this fuel was kept on site for 50 years before shipping, there would be a 90-percent reduction in the radiological hazard because of the 30- and 28-year half-lives of those fission products. DOE has chosen to do just the opposite. The Department's specifications call for shipping 5- and 10-year cooled high-burnup fuel.

Similarly, the State of Nevada has called for full-scale cask testing, not for public relations reasons, which now is being now planned by the NRC, but real tests to find out what accident forces would cause a cask to fail so there is a better handle on the type of planning the state would have to do for each type of accident, particularly accidents that involved long-duration, high-temperature fires.

The State of Nevada has been calculating impacts on Las Vegas, and the Draft Repository SEIS does not say that 100 percent of the truck shipments and 80 percent of the rail shipments could come through the Las Vegas area. It does not say that 95,000 people live within a half-mile of the rail route or between 100 and 130 thousand people live within a half-mile of the highway routes.

In addition, the DOE documents do not say that, based on State of Nevada studies, about 40,000 nonresident visitors and workers at any hour of the day would be within the half-mile that is the radiological region of influence. Almost all of the 1.9 million residents of Clark County live within a 50-mile region of influence for transportation accidents, terrorism, and sabotage events.

A commenter encouraged DOE to give higher priority to the shipment of spent nuclear fuel and high-level radioactive waste from decommissioned nuclear plants to the Yucca Mountain Repository.

Response

DOE has acknowledged the potential risks inherent in handling and shipping spent nuclear fuel and high-level wastes. Appendix D, Section D.1.5.1 of the Repository SEIS states, "exposures to high levels of radiation at high dose rates over a short period (less than 24 hours) can result in acute radiation effects." DOE agrees that if it were possible to do so, a person who remained in contact with an unshielded spent nuclear fuel assembly for 1 to 2 minutes, as described by the commenter, would be likely to experience acute radiation effects that could be fatal.

As discussed in the Repository SEIS, during transport, spent nuclear fuel and high-level radioactive waste, which are hazardous materials, would be in robust transportation casks. These casks would be

designed, manufactured, tested, certified, and operated to be consistent with regulations of the NRC (10 CFR Part 71). Numerous tests, analyses, and demonstrations in the United States and other countries have shown the extraordinary performance of shipping casks that comply with the regulatory requirements. The requirements are rigorous because the casks would be the primary systems for containment of spent nuclear fuel or high-level radioactive waste in transportation and for protection of the health and safety of members of the public from the hazardous effects of the radiation these materials emit. The casks must satisfy the regulatory requirements and provide protection for the public health and safety whether the spent nuclear fuel is 5-, 10-, or 50-year cooled or has burnup of 35,000 or 70,000 MWd/MTHM. Appendix G, Tables G-11 through G-16 of the SEIS list the radionuclide inventories of spent nuclear fuel and high-level radioactive waste DOE used to estimate the radiological impacts of transportation.

DOE's analyses, as noted in Section D.1.5.1 of the SEIS, conclude that, accidents during the shipment of spent nuclear fuel or high-level radioactive waste do not have the potential to release sufficient fission products to cause acute exposures that could immediately threaten the lives of workers or the public. In other words, workers or the public would not receive exposures to unshielded spent nuclear fuel in the course of normal transportation, or even in the event of a serious transportation accident.

DOE based the analysis of the potential impacts in the Repository SEIS on assumptions it made about the characteristics of the spent nuclear fuel it would ship. Because it is not possible to know 10 or more years in the future and for 25 to 50 years after that what particular spent nuclear fuel DOE would ship each year, the Department used the *Total System Model* (DIRS 181377-BSC 2007, all) to estimate the inventory of spent nuclear fuel at commercial nuclear plant sites that DOE could ship to the repository on an annual basis. TSM uses data from the Energy Information Agency on historical discharges of spent nuclear fuel from commercial nuclear power plants. It also uses DOE projections for discharges of spent nuclear fuel that could occur as much as 50 years in the future. DOE based the analysis in Chapter 6 of the SEIS on the characteristics of spent nuclear fuel TSM estimated for shipment in each year and the estimated number of casks that would be loaded and shipped. The model considered the radiological characteristics of the spent nuclear fuel it estimated for shipment in its determination of the number of casks to be loaded. In addition, DOE used the results of the TSM analysis to determine "representative" characteristics for shipped spent nuclear fuel. The number of casks shipped from each generator site and the representative characteristics of commercial spent nuclear fuel are the bases for the estimated impacts of transportation, transportation accidents, and acts of terrorism that the SEIS describes. DOE also used the TSM analysis to estimate the amount of spent nuclear fuel it would have to place on aging pads at the repository site.

The commenters' concern about shipping waste packages "too thermally hot for emplacement" does not consider that the reason a particular waste package could be "too thermally hot for emplacement" is simply that the emplacement strategies require that the packages selected for emplacement meet particular thermal limits. The reason that a waste package might be "too thermally hot for emplacement" would depend on the thermal load of the other packages to be emplaced together, and waste packages that are "too thermally hot for emplacement" may be transported safely.

DOE would base its determination of the characteristics of the spent nuclear fuel it would receive on the terms of the Standard Contract for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste (10 CFR Part 961). This contract and its terms were established in 1983 in compliance with the requirements of the *Nuclear Waste Policy Act*. The contract stipulates that owners of spent nuclear fuel would select the fuel assemblies they would deliver to DOE and the associated shipping facilities. The

contract does not allow DOE to stipulate the characteristics of the waste the utilities ship. The contract stipulates that owners of spent nuclear fuel are free to select the fuel assemblies they would deliver to DOE and the associated shipping facilities. DOE based the characteristics of spent nuclear fuel it used for the analysis in the Repository SEIS on its estimate, using TSM, of the spent nuclear fuel owners would deliver. Appendix H, Section H.10.4.4 of the SEIS contains the DOE response to a finding of the National Academy of Sciences report *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all) on its position about the order of acceptance of spent nuclear fuel at commercial generator facilities.

Chapter 6, Appendix A, and Appendix G of the Repository SEIS contain maps of representative routes to the Yucca Mountain Repository. Appendix G, Figure G-27 is a detailed map of the routes in Nevada.

1.6.2.5 (165)

Comment - 2 comments summarized

Transportation Policies and Procedures - Transportation Plans

The commenter noted that Western Governors' Association Resolutions 05-15, 06-7, and 07-02 present the general policy of western states on national transportation of spent nuclear fuel and high-level waste. These policy resolutions, which the governors have reconsidered and renewed several times since 1988, call for the Federal Government, in coordination with the states and tribes, to develop "a logical and timely transportation program." This program would include fixing the shipping origins and destination points as early as possible, conducting full-scale cask testing, developing responsible criteria for selecting shipping routes, developing a sound methodology for evaluating optional mixes of routes and transportation modes, conducting a thorough review of the risks of terrorism and sabotage against spent nuclear fuel and high-level radioactive waste shipments, working with state governments to ensure that adequate safeguards are in place before beginning shipments, and developing "a comprehensive transportation plan that includes the analysis of all needed transport-safety activities in a single document."

The commenter further indicated that the Proposed Action for national transportation in the Draft Repository SEIS is incomplete in that it is not yet accompanied by the "programs, procedures and controls" required to implement its "measurable goals and targets." The DOE National Transportation Plan can and should identify and explain the detailed action steps necessary to implement the measurable goals and targets in the Draft SEIS Proposed Action. Such a plan should be the companion document for implementation of the Proposed Action in the Final SEIS. The Final SEIS should make the necessary linkage between "measurable goals and targets" and implementing "programs, procedures and controls." The Final SEIS should describe the essential elements of the National Transportation Plan for repository shipments and propose overriding policies to ensure their uneventful and safe transport. These elements and policies should reflect the Western Governors' Association policies and recommendations for spent nuclear fuel and high-level radioactive waste transport (see WGA Resolutions 05-15, 06-7, and 07-02). DOE should explain how the National Transportation Plan would achieve the measurable goals and targets of the Proposed Action.

The Proposed Action for national transportation in the Repository SEIS (amended as suggested above and combined with a sufficient National Transportation Plan for implementation) could provide a useful basis for DOE to work with states and others (in particular, utilities and the transportation industry). However, the Draft SEIS does not provide information and analyses sufficient to understand the working of the national transportation system or to evaluate adequately the impacts of that system.

Response

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4.

As the National Transportation Plan will describe and as Appendix H, Section H.4 of the Repository SEIS discusses, for its transportation activities DOE would follow the established practices in DOE M 460.2-1 (DIRS 171934-DOE 2002, all). In addition, DOE would build on and borrow from the experience and successes of the Naval Nuclear Propulsion Program and other DOE programs such as the Foreign Research Reactor Spent Fuel and Waste Isolation Pilot Plant programs to ensure that its record of safety, environmental compliance, public involvement, and operations merits public confidence.

1.6.2.5 (383)

Comment - RRR000060 / 0001

The commenter expressed opposition to shipments through Humboldt County, California; he noted that the truck routes would not work for large trucks.

Response

Appendix G, Section G.9.10 has been updated to include Humboldt Bay as a site that could potentially ship spent nuclear fuel using barges, eliminating the need to use heavy-haul trucks to ship spent nuclear fuel to a nearby rail head.

1.6.2.5 (980)

Comment - RRR000662 / 0020

The Draft SEIS proposed action rejects recommendations by the National Academy of Sciences, the General Accounting Office, the State of Nevada, and other parties, that DOE ship the older, or oldest, spent fuel first. Shipping older fuel first would reduce radiological exposures from both routine operations and off-normal events (severe accidents, terrorism, sabotage). By choosing to ship hotter fuel first, when older fuel is available for shipment, DOE's proposed action violates the NRC's ALARA (as low as reasonably achievable) policy. The Draft SEIS does not evaluate the proposed action from an ALARA standpoint. Indeed, ALARA is barely mentioned in the Draft SEIS.

Response

DOE based the analyses of impacts in the Repository SEIS on design concepts for systems and concepts of operations it developed that include ALARA principles. These principles are prominent in the DOE efforts to develop a nuclear waste repository that the NRC could license at the Yucca Mountain Site. In addition, ALARA principles apply to the development of systems for accepting and transporting spent nuclear fuel and high-level radioactive waste. DOE based the canister-based approach for acceptance, transportation, aging, and disposal of commercial spent nuclear fuel that it describes in the SEIS on the principle of handling spent fuel only once, thereby reducing exposure of workers and the public to radioactive materials and the radiation they produce. The Department based the initiatives it has taken, and will continue to take, on scopes of activity that are in its control and that consider ALARA principles. However, it should be noted that in order to conservatively assess impacts, DOE generally did not use doses as low as those experienced at other facilities, but used the maximum permitted regulatory dose.

DOE will base its determination of the characteristics of the spent nuclear fuel it would receive at the proposed repository on the terms of the Standard Contract for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste (10 CFR Part 961). This contract and its terms were established in 1983 in accordance with the requirements of the NWPA. The contract does not call for DOE to receive oldest fuel first. It provides that owners of spent nuclear fuel would select the fuel assemblies for delivery to DOE. TAD-based transportation systems would be certified under 10 CFR Part 71, and thermal limitations that would ensure adequate heat dissipation from the interior cavity would be similar to existing canister and bare spent nuclear fuel cask systems. As a practical matter, to use the full capacity of the TAD canisters these limits would probably require considerable aging of the spent nuclear fuel at reactors before shipment, which would limit the ability to adopt a hottest fuel first strategy.

1.6.2.5 (984)

Comment - RRR000662 / 0026

The Draft SEIS (page 6-3) states that "most shipments" will use dedicated trains. Because DOE anticipates making some rail shipments by general freight service, the Draft SEIS must present a separate assessment of these risks. Nevada is particularly concerned about the potential impacts of general freight rail shipments through Las Vegas and/or Reno-Sparks.

Response

The Repository SEIS contains analyses and information to supplement those in the Yucca Mountain FEIS. The FEIS presented results of the DOE analysis of the impacts of national transportation of spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository from 77 generator sites for mostly rail and mostly legal-weight truck national transportation scenarios. The analysis of the mostly rail scenario used data and assumptions from information and statistics for general freight rail transportation.

The analyses of transportation impacts in the Repository SEIS provide updated information that addresses developments in the Yucca Mountain Project that occurred after publication of the Yucca Mountain FEIS. The updates in Section 6.1 of the SEIS include changes in data and assumptions to enable the analysis to reflect DOE plans, announced in 2005, to use dedicated trains for most rail shipments. The results in the SEIS, which are based on the use of dedicated trains, and the results in the FEIS, which were based on assumptions and data for general freight rail transportation, encompass the impacts of rail transportation of spent nuclear fuel and high-level radioactive waste nationally and in the State of Nevada.

1.6.2.5 (997)

Comment - RRR000662 / 0038

The Draft SEIS, in Appendix H, provides an overview of the findings and recommendations of the 2006 report by the National Academy of Sciences (NAS) Committee on Transportation of Radioactive Waste entitled *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States* (DIRS 182032). However, the Draft SEIS, the Draft Rail Corridor SEIS, and the Draft Rail Alignment EIS, fail to adopt key recommendations of the NAS study, including:

- An independent examination of security should be carried out before the commencement of repository shipments;

- Risks can be reduced by shipping the older fuel first;

- DOE should identify and make public preferred highway and rail routes to the repository as soon as possible;

- Potential adverse social and economic impacts of repository shipments are, for many members of the public, as important as health and safety impacts, and special government efforts will be needed to manage social and economic impacts;

- Serious consideration be given to taking the transportation program out of the DOE repository program, or out of DOE altogether.

Response

Appendix H, Section H.10 of the Repository SEIS discusses the findings and recommendations of the National Academy of Sciences report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all). Section H.10 also discusses DOE positions on, or approaches to, aspects of each finding and recommendation in that report.

1.6.2.5 (1069)

Comment - RRR000617 / 0111

Page 2-109, Section 2.2.6.1—There needs to be a tracking device mounted on all cask rail cars and/or casks to track all nuclear fuel shipments from point of origin to point of destination.

Recommendation: The EIS needs to describe how DOE intends to track all nuclear fuel shipments from point of origin to point of destination. The EIS should analyze the use of Radio Frequency Identification (RFID) tags as one alternative for cask and/or cask rail car tracking.

Response

For two decades the Department has used and periodically updated its TRANSCOM system to track the movement of unclassified radioactive material shipments that have been subject to heightened public interest or concern. TRANSCOM is a satellite-based tracking system that uses state-of-the-art technology and computer-based secure information transfers through the Internet. The TRANSCOM system allows near-real-time secure exchanges of shipment information between and among shipment escorts, a vehicle operator, and onboard monitoring and control systems; the DOE control center; and state and tribal authorities through whose jurisdictions a shipment would pass. TRANSCOM-tracked shipments have included core debris from the damaged Three Mile Island Unit 2 plant (1986-1990), foreign research reactor spent nuclear fuel (1996-present), commercial spent nuclear fuel from the West Valley Demonstration Project (2003), and transuranic wastes to the Waste Isolation Pilot Plant (1998-present). DOE anticipates that it would use a future version of the TRANSCOM system that possibly incorporated radio-frequency identification tag technology or an equivalent to track shipments of spent nuclear fuel and high-level radioactive waste to the repository. It is not possible to foresee technologies that might be in use 10 years in the future to track shipments of spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository. Nevertheless, DOE maintains its awareness of tracking technologies in use (such as radio-frequency identification tags) and emerging technologies it could adopt to enhance safety, security, and efficiency and promote public confidence in its shipments.

1.6.2.5 (1941)

Comment - RRR000656 / 0100

Also, toward the end of this discussion on page 5-39, we should point out that in case of any temporary disruption of rail service, SNF [spent nuclear fuel] shipments may have to travel by existing roadways to the Repository. No plan is proposed for this. DOE should coordinate with the State of Nevada and local jurisdictions to come up with a plan for this contingency.

Response

The Yucca Mountain FEIS analyzed the mostly truck scenario, in which DOE would ship more than 99 percent of the spent nuclear fuel and high-level radioactive waste by truck. The impacts of this scenario and the scenario in the Repository SEIS, in which DOE would ship about 10 percent of these materials by truck, would effectively encompass the case in which there was a temporary disruption of rail service.

1.6.2.5 (2573)

Comment - RRR000661 / 0002

DOE should incorporate into their National Transportation Plan for spent fuel and high-level wastes the National Academies' 2006 recommendations for enhancing the safety and security of spent fuel transport.[1] These include:

Transportation planners and managers should conduct detailed surveys of transportation routes to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration, high temperature, fully engulfing fires; planners should take steps to avoid or mitigate such hazards before shipments begin. (pg. 10)

Full-scale package testing should continue to be used as part of the analytical and testing programs to validate package performance. (pg. 14)

DOE should continue to ensure effective involvement of states and tribes in routing and scheduling of DOE spent fuel shipments. (pg. 15)

DOE should fully implement its dedicated train and mostly rail decision before DOE begins transporting nuclear waste to the repository to avoid the need for a stopgap shipping program using general trains. (pg. 17, 19)

DOE should identify and make public its suite of preferred highway and rail routes for transporting spent fuel and high-level waste to a repository as soon as practicable to support state and local planning, especially emergency response planning and follow the foreign research reactor spent fuel program in involving states and tribes in these route selections to obtain access to their familiarity with accident rates, traffic and road conditions and emergency preparedness. (pg. 18)

DOE should negotiate with commercial spent fuel owners to ship the older fuel first except where spent fuel storage risks at specific plants dictate the need for immediate shipments; there are clear safety advantages from shipping older (radiologically and thermally cooler) spent fuel first. Therefore, the risk from these shipments would drop dramatically as well if the spent fuel generators and owners could be persuaded by DOE to ship their older fuel first. (pg. 20)

DOE should begin shipments through a pilot program involving relatively short, logistically simple movements of oldest fuel from closed reactors to demonstrate the ability to transport this waste in a safe and operationally effective manner. (pg. 20)

DOE should immediately begin to carry out its emergency responder preparedness responsibilities defined in Section 180 (c) of the NWPA. DOE should establish a cadre of professional ... emergency responders to work with the Department of Homeland Security to provide consolidated "all-hazards" training materials and programs for first responders, include trained emergency responders on the shipment escort teams, use emergency responder preparedness programs for community outreach along planned routes. (pg. 20)

An independent examination of the security of spent fuel and high-level waste transportation should be conducted before large quantity repository shipments to a repository begin including an evaluation of the threat environment, response of packages to credible malevolent acts, and operational security requirements for protecting spent fuel and high-level waste in transport. (pg. 8)

DOE should work with the Department of Homeland Security, Department of Transportation, and NRC to develop, apply, and disclose consistent, reasonable and understandable criteria for protecting sensitive information about spent fuel and high-level waste shipments. They should commit to the open sharing of information that does not require protection and should facilitate timely access to such information. (pg. 21)

DOE and Congress should examine options for changing the organizational structure of DOE's spent fuel transportation program to give the transportation program greater planning authority, greater flexibility to support future transportation programs and make the multi-year commitments needed to plan for, procure and construct the necessary transportation infrastructure. (pg. 23)

The transportation system in the Draft SEIS Proposed Action does not adequately reflect those recommendations.

1 "Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States," The National Academies Press, 2006.

Response

Appendix H, Section H.10 of the Repository SEIS contains DOE's positions regarding the findings and recommendations in the National Academy of Sciences report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all).

1.6.2.5 (2835)

Comment - RRR000655 / 0015

Transportation planning: On page H-9, the SEIS says, "DOE is preparing a comprehensive national spent fuel transportation plan that accommodates stakeholder concerns to the extent practicable." Later in Section H.4.3, however, the SEIS mentions a "Transportation Operations Plan" and "individual site plans." What is the relationship, if any, between these three plans (or types of plans)?

Response

The National Transportation Plan will be an overarching plan that will outline the challenges and strategies for the development and implementation of the system necessary to transport spent nuclear fuel and high-level radioactive waste to Yucca Mountain.

The Transportation Operations Plan would be a more detailed plan that provided the basis for planning shipments. This plan would describe the operational strategy and delineate the steps to ensure that shipments meet regulatory and DOE requirements. It would include information on organizational roles

and responsibilities, shipment materials, projected shipping windows, estimated numbers of shipments, carriers, packages, sets of routes, prenotification procedures, safe parking arrangements, tracking systems, security arrangements, public information, and emergency preparedness, response, and recovery.

DOE would develop individual site plans that included the information necessary to ship from specific sites. These plans would include roles and responsibilities of the participants in the shipping campaign, shipment materials, schedules, number of shipments, types and number of casks and other equipment, carriers, routes, in-transit security arrangements, safe parking arrangements for rail and truck shipments, communications including prenotification, public information, tracking, contingency planning, and emergency preparedness, response, and recovery. The site plans would contain more detail than either the National Transportation Plan or the Transportation Operations Plan.

1.6.2.5 (2836)

Comment - RRR000655 / 0014

Transportation operational contingencies: In section H.4.6, as in others that address topics in the DOE Transportation Practices Manual, DOE should reiterate its intent to follow the manual and make sure the text matches what is in the manual. That is, for weather checks, the SEIS should either cite or paraphrase from the manual.

In this same section, the SEIS says the states and tribes would provide input on weather through TRANSCOM. This is not practical, therefore DOE should identify a different method (for example, phone calls). This section also mentions that, "[i]f the shipment encountered unanticipated severe weather, the operators would contact this [transportation operations] center to coordinate routing to a safe stopping area if it became necessary to delay the shipment until conditions improved" (p. H-11). This section should mention state involvement in deciding to move a shipment into safe parking (again, consistent with the DOE manual).

Response

As discussed in Appendix H, Section H.4 in the Repository SEIS, for transportation activities that involved shipments of spent nuclear fuel and high-level radioactive waste, DOE would follow established Departmental practices in Radioactive Material Transportation Practices, DOE M 460.2-1 (DIRS 171934-DOE 2002, all). In addition, DOE would build on, and borrow from, the experiences and successes of the Naval Nuclear Propulsion Program and DOE programs such as the Foreign Research Reactor Spent Fuel and Waste Isolation Pilot Plant programs to ensure that its record of safety, environmental compliance, public involvement, and operations merited public confidence.

DOE has modified Appendix H, Section H.4.6 of the Repository SEIS to be consistent with DOE M 460.2-1.

Appendix H, Section H.4.10 of the Repository SEIS discusses safe parking. DOE M 460.2-1 specifies that selection of safe parking areas will be coordinated with the states and tribes through which the shipments will pass. State, tribal, and local law enforcement personnel have the authority to direct shipments to specific parking areas. If state or tribal officials (normally, law enforcement personnel) determine that a route deviation rather than safe parking is necessary, they can inform the driver or carrier through direct contact or through TRANSCOM.

1.6.2.5 (2907)

Comment - RRR000655 / 0009

Rail transport: Why is DOE limiting rail shipments of commercial spent fuel to three cars per train, whereas DOE spent fuel and high-level waste will travel in trains containing five cars (p. G-35)? Also, it appears from the analysis that each train will consist of casks from only one site—is that truly DOE's plan? Or is DOE using this configuration in its analysis to bound the potential impacts? If DOE is, indeed, planning to limit its trains to three or five casks per train, what is the reason? If it is possible or practical to ship more than three casks per train, then DOE should consider doing so to further reduce the total number of shipments and, thereby, the impacts of the transportation program. If DOE does plan to combine casks from different sites on one train, where will the marshalling yards be?

Response

DOE does not plan to limit the number of casks on a train. The impacts of transporting spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository described in the Repository SEIS would be from activities that would begin many years in the future and would continue for up to 50 years. DOE had to make assumptions about the characteristics of future transportation systems and activities to analyze and estimate the impacts. The Department selected data and assumptions would provide reasonable and realistic representations of transportation systems and operations, and at the same time, lead to conservative estimates of the impacts that would result.

Therefore, for example, DOE made assumptions for the impact analysis about the number of cask cars it would transport in a dedicated train. Because the Department cannot know years in advance how many cask cars it would transport in each train, it used averages or representative values to represent shipments. It used assumptions about the average number of cars that would be in a train that it considered reasonable and realistic based on considerations of the logistics of loading shipping casks, preparing casks for shipment, loading casks onto rail cars, and positioning shipments for pickup by a railroad. The averages differ for shipments that would originate at DOE sites from those for shipments that would originate at commercial nuclear plant sites because the assumptions, made for the analysis of impacts, differ for logistics for the two types of sites.

The use of marshalling yards to assemble shipments from multiple sites into larger shipments might be possible, but DOE has not evaluated it.

1.6.2.5 (3815)

Comment - RRR000313 / 0007

The commenter proposed that DOE never use the railcars it would use for nuclear waste for another purpose; the Department should paint nuclear waste cars cobalt blue with standard symbols, flashing lights, and beep warning signals powered by solar energy.

Response

DOE would use specially designed, heavy-duty rail cars to transport shipping casks that contained spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository. The rail cars would meet requirements specified in Association of American Railroads Standard S-2043 (DIRS 166338-AAR 2003, all). DOE does not envision using the cars for any rail freight transportation service other than to move loaded and unloaded shipping casks. In the course of their normal use, the cars would become

neither radioactive nor contaminated by radioactive materials. Therefore, they would not require special handling or disposition when DOE was not using them to transport casks.

U.S. Department of Transportation regulations specify markings, labeling, and placards for shipments of radioactive materials. The regulations require placement of RADIOACTIVE 7 hazardous material placards on the sides of rail cars that transport radioactive material casks that have Fissile, Yellow II, or Yellow III radioactive material labels. DOE would affix RADIOACTIVE 7 placards to the sides of rail cars that transported spent nuclear fuel or high-level radioactive waste to the Yucca Mountain Repository.

1.6.2.5 (4021)

Comment - RRR000995 / 0011

The commenter suggested the need for DOE to clarify if existing or future regulations would require it to notify the State of Nevada of transportation of construction materials.

Response

DOE is not aware of any such regulations.

1.6.2.6 Transportation Cost

1.6.2.6 (2897)

Comment - RRR000688 / 0025

The commenter stated that overweight trucking should not be allowed because of damage to roadways and questioned who would pay for the repair of the roadways.

Response

Overweight truck permitting requirements, such as seasonal frost restrictions or axle spacing and weight limits, would reduce impacts from these trucks on highway infrastructure. In general, a combination of local, state, and federal funds pays for the repair of roadways such as Interstate Highways.

1.6.2.7 Transportation Accidents

1.6.2.7 (356)

Comment - RRR000396 / 0009

The Draft SElS does not consider "worst-case" accidents in its NEPA analysis because such combinations of factors were considered "not reasonably foreseeable." Yet, the Draft SElS acknowledges that clean-up costs after a very severe transportation incident involving a repository shipment resulting in the release of radioactive material could range from $300,000 to $10 billion. The Final SElS should evaluate the impacts from a credible worst-case transportation accident or terrorist attack, as well as other accidents scenarios caused by human error. A National Academy of Sciences (NAS) study recommended that detailed surveys of transportation routes for spent fuel be done to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration, fully engulfing fires and that steps should be taken to avoid or mitigate such hazards. The Final SElS should identify the shipping corridors and include route-specific analyses that identify potential hazards along shipment routes. The risk analyses should include the potential consequences of a severe accident or terrorist attack involving extreme, long duration fire conditions that exceed package performance requirements. The Final SElS should also consider the impact of human error as well as the potential for unique local conditions to

exacerbate the consequences of accidents or terrorist attacks. Certain segments of possible routes in California could provide conditions in which an accident or terrorist attack could exceed the spent fuel packaging performance requirements. Two major highway accidents that occurred this year on California highways (one in the Bay Area and one in Santa Clarita tunnel fire) are being investigated to determine whether these accidents may have resulted in conditions, in particular fire temperatures and fire durations, which approached or exceeded packaging performance requirements. Similarly nearly half of the 16 historical severe accident scenarios that were examined in the NAS 2006 study on spent fuel transport safety occurred in California. The Final SEIS should examine credible accident scenarios that could exceed packaging performance standards. In the draft Rail EIS, the DOE proposes to ship newer spent nuclear fuel first, contrary to the recommendation made by the NAS that the oldest spent fuel be shipped first to the repository. This recommendation was proposed because fuel that has aged fifty or more years contains significantly less amounts of Cesium-90 and Strontium-137. These radioactive isotopes present the most substantial risk to workers who package the spent fuel for transport, and those involved in the actual transport of spent fuel. Inyo County recommends that the Final Rail EIS incorporate the NAS's recommendation of the oldest fuel being shipped first to Yucca Mountain.

Response

Appendix G, Section G.9.4 of the Repository SEIS discusses accidents involving spent nuclear fuel casks in tunnels. Based on analyses performed by the NRC, the consequences of an accident involving a spent nuclear fuel cask in a tunnel fire such as the Baltimore Tunnel fire or the Caldecott Tunnel fire would be very small.

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

Section 6.3.4 of the SEIS discusses the consequences of sabotage events. The estimated consequences of a sabotage event that involved a truck cask would be 0.055 latent cancer fatality for the population in rural areas and 28 latent cancer fatalities for the population in urban areas.

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would

result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

DOE also updated Section G.9.6 to provide a more-in-depth discussion of human error.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

The terms of the Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (10 CFR Part 961) require DOE to assign priority to generator sites that discharged spent nuclear fuel earliest. DOE would have to pick up fuel from sites that the generators designated with the oldest fuel regardless of the location. At sites that the generators who owned the oldest spent nuclear fuel designated, DOE would have to pick up fuel the generators selected and that had cooled for at least 5 years. Regardless of which fuel DOE shipped first, it would perform the shipments safely in NRC-certified casks for the specific type of fuel. Much of the oldest fuel is already blended with newer fuel in dry storage canisters or containers and neither DOE nor the utility would be likely to remove and segregate the oldest fuel. The standard contract does not allow DOE to specify the characteristics of the spent nuclear fuel that the utilities ship. TAD-based transportation systems would be certified under 10 CFR Part 71, and thermal limitations that would ensure adequate heat dissipation from the interior cavity would be similar to existing canister and bare spent nuclear fuel cask systems. As a practical matter, to use the full capacity of the TAD canisters these limits would probably require considerable aging of the spent nuclear fuel at reactors before shipment, which would limit the ability to adopt a hottest fuel first strategy.

1.6.2.7 (431)

Comment - RRR000089 / 0004

The commenter recounted incidences of radioactive transport accidents in the past and asked, if DOE used computer modeling to predict future accidents, did the models predict the one per year that has occurred in the preceding 4 years.

Response

Over the past 30 years, there have no accidents involving a release of radioactive material from a spent nuclear fuel cask. DOE used truck and rail transportation accident statistics and computer models to estimate accident risks in the Repository SEIS. In addition, truck and rail transportation accident statistics are often used to estimate risks of shipping nonradioactive hazardous materials. However, these models are most useful for estimating the number of accidents over long periods, not the number of accidents over short periods, as suggested by the commenter.

1.6.2.7 (565)

Comment - RRR000013 / 0005

The commenter does not believe DOE has adequately addressed transportation safety and security issues, in particular worst-case accidents; and believes that the analysis is too general, does not include unique local conditions along specific routes, constrains terrorist attack consequences, and does not address cleanup costs from a severe accident. The commenter expressed the thought that shipping from sites would be more like 25 percent to 35 percent by truck rather than the 10 percent that DOE stated in the Rail Alignment EIS.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4 DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences "worse" than those previously estimated would be based on pure conjecture and would not be supported by credible scientific evidence.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

For perspective, the current insured limit of responsibility for an accident that involves releases of radioactive materials to the environment is $10.26 billion (Appendix H.9.2 of the Repository SEIS).

The Yucca Mountain FEIS analyzed the mostly truck scenario, in which DOE would ship more than 99 percent of the spent nuclear fuel and high-level radioactive waste by truck. The impacts of this scenario and the scenario in the Repository SEIS, in which DOE would ship about 10 percent of these materials by truck, would effectively bracket the 25- to 35-percent truck case the commenter suggested.

1.6.2.7 (637)

Comment - RRR000006 / 0003

The commenter does not believe DOE has adequately addressed transportation safety and security issues, in particular worst-case accidents, and believes that the analysis is too general, does not include unique local conditions along specific routes, constrains terrorist attack consequences, and does not address cleanup costs from a severe accident.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." As discussed in Sections 6.3.3.2 and G.7 of the Repository SEIS, the accident analyses in the SEIS include these "maximum reasonably foreseeable accidents." The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

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Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

For perspective, the current insured limit of responsibility for an accident that involves releases of radioactive materials to the environment is $10.26 billion (Appendix H, Section H.9.2 of the SEIS).

1.6.2.7 (726)

Comment - RRR000322 / 0001

Spent nuclear fuel is lethal. Spent nuclear fuel from nuclear power plants would comprise about ninety percent of the waste shipped to the repository. The spent nuclear fuel that DOE plans to ship is so radioactive that even after ten years of cooling, unshielded exposure to a single fuel assembly could deliver a lethal dose of radiation in one to two minutes.

Each shipping cask would contain an enormous amount of radioactive material. Fission products, especially Strontium-90, with a half-life of twenty-eight years, and Cesium-137, with a half -life of thirty years, account for most of the radioactivity in spent nuclear fuel for the first hundred years after removal from reactors. Each truck cask of commercial spent nuclear fuel would contain more than 350,000 curies of radioactive Cesium and Strontium, about twenty to thirty times the amount of those fission products released by the Hiroshima bomb.

Every dedicated train hauling three or four rail casks would contain more Cesium-137 then the total amount released during the Chernobyl accident. The shipping casks will not be tested to determine accident failure thresholds. The Nuclear Regulatory Commission, NRC, does not currently require full-scale physical testing of shipping casks. None of the spent nuclear fuel shipping casks currently used in the United States have ever been tested full scale.

NRC has developed a plan for demonstration testing of the new rail casks for DOE TAD canisters, but the tests are designed to promote public confidence and will not actually determine cost failure thresholds, will not include a fire test, and will not include truck casks. DOE and the nuclear industry oppose mandatory full-scale impact and fire tests for new cask designs.

The consequence of a severe transportation accident could be much more severe than DOE estimates. In the draft SEIS for Yucca Mountain, DOE chose not to evaluate "Worst case accidents in which all factors combine in the most disadvantageous way," because "such events are not reasonably foreseeable." Moreover, the DOE accident analysis did not include consideration of human error in the design, fabrication, and loading of shipping casks.

DOE also chose not to consider unique local conditions that could result in more severe accidents or consequences. DOE does acknowledge that [cleanup] costs following a transportation accident resulting in the release of radioactive materials could range from 300,000 to $10 billion. The consequences of a successful terrorist attack could be much more severe than DOE estimates.

DOE acknowledges in the FEIS and the draft SEIS that both truck and rail casks are vulnerable to terrorist attacks or sabotage involving certain types of military and commercial explosive devices. However, DOE has chosen not to consider attack scenarios involving multiple weapons or combinations of weapons that could result in radioactive releases. Human health effects and cleanup costs that could be ten to hundreds of times greater than DOE estimates.

Nevada's sponsored studies have concluded that a credible attack scenario in an urban area could release enough radioactive material to cause thousands of latent cancer fatalities and require cleanup and recovery costs exceeding $10 billion.

Response

DOE has acknowledged the potential risks inherent in handling and shipping spent nuclear fuel and high-level wastes. Appendix D, Section D.1.5.1 of the Repository SEIS states, "exposures to high levels of radiation at high dose rates over a short period (less than 24 hours) can result in acute radiation effects." DOE agrees that if it were possible to do so, a person who remained in contact with an unshielded spent nuclear fuel assembly for 1 to 2 minutes, as described by the commenter, would be likely to experience acute radiation effects that could be fatal.

The NRC has certified many types of spent nuclear fuel casks without full-scale tests on the designs. The Commission is currently conducting a Package Performance Study that might include full-scale testing of

a typical spent nuclear fuel transport cask. DOE is monitoring this study closely and will comply with any revised regulations that result.

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

DOE also updated Section G.9.6 to provide a more-in-depth discussion of human error.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

For perspective, the current insured limit of responsibility for an accident that involves releases of radioactive materials to the environment is $10.26 billion (Appendix H, Section H.9.2 of the SEIS).

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4 DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences "worse" than those previously estimated would be based on pure conjecture and would not be supported by credible scientific evidence.

1.6.2.7 (815)

Comment - RRR000069 / 0001

The commenter pointed out that spent nuclear fuel assembles are highly radioactive and that 10 years after they were out of the reactor they could inflict a lethal dose in 1 to 2 minutes. Twenty years after the fuel assembly was out of the reactor, a 1-percent release from a shipping container would cost hundreds of millions of dollars to clean up in a rural area, billions to clean up in an urban area. DOE would have served its own purposes better by having a clearer up-front description of exactly what spent nuclear fuel is and exactly what its radiological hazard is. DOE has dealt with a lot of transportation safety and security issues but the State of Nevada disagrees with the DOE estimate of consequences. The State gives DOE high marks in comparison with the U.S. Nuclear Regulatory Commission in that DOE has actually presented the issue. The TAD canister system that DOE has proposed does not exist yet. Therefore, DOE is talking about something quite speculative.

Response

DOE would transport spent nuclear fuel and high-level radioactive waste in robust casks that could withstand the impact forces and fires from severe transportation accidents. Further, the casks would be watertight following such accidents. Many tests and extensive analyses that used the most advanced analytical methods have demonstrated that casks would provide containment and shielding even under the most severe accidents that could occur. A study by Sandia National Laboratories (DIRS 152476-Sprung et al. 2000, all) concluded that casks would continue to contain spent nuclear fuel in more than 99.99 percent of all accidents. Appendix H, Section H.5 of the Repository SEIS contains information on the safety and testing of transportation casks.

Spent nuclear fuel and high-level radioactive waste are not easily dispersed; they do not dissolve in water; they are not liquids or gasses that can spill or leak; and, with the exception of a very small, nearly undetectable effect, radiation from them does not make other materials radioactive. They are solids. They are hard, tough, and dense ceramics, metals, or glasses in tough metal barriers.

Appendix G, Section G.4 of the Repository SEIS contains the radionuclide inventory in spent nuclear fuel.

Because unshielded spent nuclear fuel can be hazardous, it is shipped in heavily shielded casks. The maximum radiation dose rate from a spent nuclear fuel cask is about 10 millirem per hour at 2 meters from its transporting vehicle. For perspective, the radiation dose from a single chest x-ray is about 8 millirem. Therefore, the radiation dose from standing 2 meters from a shipment of spent nuclear fuel for 1 hour would be equivalent to little more than one chest X-ray, and much lower than a lethal radiation dose.

DOE used the best available information on TAD canister systems to prepare the Repository SEIS. This information is sufficient to perform an adequate and meaningful evaluation of the project. The Department will evaluate potential changes under its *National Environmental Policy Act* implementing regulations and guidance, and will assess the need for additional evaluations under those processes and mechanisms.

1.6.2.7 (985)

Comment - RRR000662 / 0028

The Draft SEIS (pages 6-17 to 6-20) improperly applies probabilistic risk analysis to severe transportation accidents. Attachments to these comments document the uncertainties associated with estimating frequency of occurrence for what DOE calls “reasonably foreseeable accidents,” and recommend an alternative approach, comprehensive risk assessment, which analyzes consequences of accidents much more severe than those evaluated by DOE in the Draft SEIS. Moreover, the Draft SEIS ignores the evidence presented in DIRS 181756 that evaluation of accident consequences must consider unique local conditions, for example, regarding accident locations along potential rail and highway routes through the City of Las Vegas and Clark County.

Response

As discussed in Appendix G, Section G.9.9 of the Repository SEIS, probabilistic risk assessment has been the standard tool for transportation risk assessments since the NRC published the Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes in 1977 (DIRS 101892-NRC 1977, all). DOE used probabilistic risk assessment to estimate transportation impacts in this SEIS

because there are adequate data, methods, and computer programs to make it a valid, state-of-the-art tool. The analysis accounts for the most severe accidents that are reasonably foreseeable.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

1.6.2.7 (986)

Comment - RRR000662 / 0024

The Draft SEIS assessment of transportation safety and security is deeply flawed. The Draft SEIS does not consider worst case accidents—it simply assumes that such combinations of factors "are not reasonably foreseeable" without any justification or analysis. The Draft SEIS underestimates the consequences of severe accidents involving long duration fires. The Draft SEIS underestimates the consequences of a terrorist attack or act of sabotage. The Draft SEIS inappropriately dismisses potential for human error to exacerbate consequences of accidents or terrorist attacks without explanation or analysis. The Draft SEIS fails to evaluate the potential for unique local conditions to exacerbate consequences of accidents or terrorist attacks. DOE superficially acknowledges, but fails to seriously consider, transportation safety and security analyses prepared by the State of Nevada ("an opposing viewpoint"). The Draft SEIS acknowledges clean-up costs after a very severe accident could reach $10 billion.

The DOE's Landscan process for adjusting the census numbers (to determine affected populations) is not available for review, and it is impossible to determine how many people live within the region of influence. The Draft SEIS also fails to consider reasonable criticality potential and consequences for high-level waste or spent fuel during a terrorist incident. Indeed, one terrorist scenario could be to induct criticality in a shipping cask through the intentional or inadvertent injection of water into the container.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these accident scenarios involved long duration fires. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4 DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences "worse" than those previously estimated would be based on pure conjecture and would not be supported by credible scientific evidence.

Appendix G, Section G.9.6 of the Repository SEIS has been updated to provide a more-in-depth discussion of human error.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

For perspective, the current insured limit of responsibility for an accident that involves releases of radioactive materials to the environment is $10.26 billion (Appendix H.9.2 of the SEIS).

Johnson and Michelhaugh (DIRS 181276-2003, Section 2.5) discusses the Landscan process used to determine the populations along transportation routes.

Appendix G, Section G.9.2 of the Repository SEIS discusses criticality during transportation accidents. NRC regulations (10 CFR Part 71) require that casks used to ship spent nuclear fuel and high-level radioactive waste be able to survive accident conditions, such as immersion in water, without undergoing a criticality. To meet this requirement, casks are typically designed such that, even if water filled the cask and the cask contained unirradiated nuclear fuel (the most reactive case from the perspective of criticality), a criticality would not occur. Therefore, a criticality during a sabotage event would be highly unlikely.

1.6.2.7 (989)

Comment - RRR000662 / 0029

The Draft SEIS (pages G-52 to G-54) characterizes the transportation accident cleanup costs provided by the State of Nevada as "worst cases" and "not reasonably foreseeable." This is another instance in which DOE has improperly applied probabilistic risk analysis to severe transportation accidents. The cost estimates provided by the State of Nevada in DIRS 181756, assumed that credible worst case truck and rail accidents occurred in Las Vegas, reflecting unique local population and building characteristics, unfavorable weather conditions, and less than optimal emergency response. This is precisely the type of analysis that DOE should have provided in the Draft SEIS. The cleanup costs for a sabotage incident estimated in DIRS 181892 are comparable to cleanup costs estimated in studies of large radiological dispersal devices ("dirty bombs") in major urban areas.

Response

As discussed in Appendix G, Section G.9.9 of the Repository SEIS, probabilistic risk assessment has been the standard tool for transportation risk assessments since the NRC published the Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes in 1977 (DIRS 101892-NRC 1977, all). DOE used probabilistic risk assessment to estimate transportation impacts in this SEIS because there are adequate data, methods, and computer programs to make it a valid, state-of-the-art tool.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

Appendix G, Section G.9.7 of the Repository SEIS mentions the two studies mentioned by the State of Nevada, Lamb et al. (DIRS 181756-Lamb et al. 2001, all) and Lamb et al. 2002 (DIRS 181892-Lamb et al. 2002, all). As discussed in Section G.9.7, these analyses assert that the costs of cleanup could be much higher than the estimates discussed in this Repository SEIS. The state estimated these costs based on contamination levels that were estimated using computer programs that DOE developed and uses. However, the state's analysis used values for parameters that would be at or near their maximum values. DOE guidance for the evaluation of accidents in environmental impact statements (DIRS 172283-DOE 2002, p. 6) specifically cautions against the evaluation of scenarios for which conservative (or bounding) values are selected for multiple parameters because the approach yields unrealistically high results. Therefore, DOE believes that the State of Nevada estimates are unrealistic and that they do not represent the reasonably foreseeable cleanup costs of severe transportation accidents.

1.6.2.7 (990)

Comment - RRR000662 / 0031

The Draft SEIS (page G-52) ignores past instances in which human errors in cask fabrication and cask loading actually occurred during NRC-licensed shipments, and created conditions that could have compromised cask performance in the event of a transportation accident or sabotage event.... DOE provides no evidence to support its assertion that NRC regulations will adequately address this issue, or that NRC regulations can prevent willful violation of NRC regulations.

Response

Appendix G, Section G.9.6 of the Repository SEIS has been updated to provide a more-in-depth discussion of human error.

1.6.2.7 (991)

Comment - RRR000662 / 0032

The Draft SEIS (page G-55) merely asserts that the transportation probabilistic risk assessment is valid, without responding to the detailed criticisms presented by the State of Nevada. The Draft SEIS misses the point made by Nevada: when probabilistic risk assessment is used under conditions of uncertainty, it should be balanced by evaluation of credible worst case events, such as the accident and sabotage scenarios suggested by Nevada. The transportation sensitivity analyses for reduced TAD use, and constrained national rail routing, performed by DOE in Appendix A, do not evaluate the most significant transportation radiological risk factors (such as spent fuel cooling time), and therefore do not respond to Nevada's safety and security concerns.

Response

As discussed in Appendix G, Section G.9.9 of the Repository SEIS, probabilistic risk assessment has been the standard tool for transportation risk assessments since the NRC published the Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes in 1977 (DIRS 101892-NRC 1977, all). DOE used probabilistic risk assessment to estimate transportation impacts in the SEIS because adequate data, methods, and computer programs make it a valid, state-of-the-art tool.

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

DOE based the severe accident and sabotage analyses in the Repository SEIS on commercial spent nuclear fuel with a burnup of 60,000 MWd/MTHM and a decay time of 10 years. In comparison with spent nuclear fuel with longer decay times (older fuel), the spent nuclear fuel that DOE analyzed in the SEIS would have higher impacts and the analysis in the SEIS would be bounding, and explicit analysis of older spent nuclear fuel is not necessary.

1.6.2.7 (993)

Comment - RRR000662 / 0034

The Draft SEIS (pages 6-20 to 6-23) ignores evidence, including terrorism studies funded by DOE, that DOE nuclear activities may be particularly attractive symbolic targets for sabotage or terrorist attacks. Further, the Draft SEIS ignores evidence that attacks using one or more weapons that completely perforate the shipping cask, or a combination of weapons specifically designed to breach, damage, and disperse the cask contents, could result in consequences more severe than those evaluated by DOE. The potential for such attacks is documented in the attachments to these comments. DOE presents no evidence to support ... its assertion that the factors identified by the State of Nevada "could affect the chances of success but not the outcome of the sabotage event." State of Nevada contractors are currently preparing an updated consequence analysis of a two-weapon attack on a 21-PWR [pressurized-water

reactor] TAD transport cask, which results in full perforation of the cask, and a release of 8,000-36,000 curies of cesium-137.

Response

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4 DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences "worse" than those previously estimated would be based on pure conjecture and would not be supported by credible scientific evidence.

1.6.2.7 (994)

Comment - RRR000662 / 0035

The Draft SEIS (pages 6-41 to 6-42) ignores evidence presented by the State of Nevada that certain types of accidents, for example, accidents involving military aircraft and/or vehicles carrying munitions, could result in more severe consequences than those evaluated in the FEIS or in the Draft SEIS. The estimated radiation doses to members of the public from Nevada transportation (Table 6-15) ignore evidence presented by the State of Nevada that such doses could be considerably higher, depending upon the number of shipments, vehicle and train speeds, and location and duration of vehicle and train stops. The potential for such impacts is documented in the attachments to these comments. Moreover, the potential for any measurable radiation doses to members of the public in Las Vegas, as a result of repository shipments, and/or the creation of any elevated radiation exposure zones along routes through Las Vegas, could result in significant localized stigma and perceived risk impacts, which are not addressed in the Draft SEIS.

Response

As discussed in Appendix G, Section G.9.2 of the Repository SEIS, 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, stationary or moving, is extremely remote. The Yucca Mountain FEIS analyzed the consequences of a hypothetical accident in which a large commercial aircraft or a military aircraft crashed directly on a cask (DIRS 155970-DOE 2002, Section J.3.3.1). The analysis showed that the penetrating force of a jet engine's center shaft would not breach the heavy shield wall of a cask. 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 its integrity.

The Renewal of the Nellis Air Force Range Land Withdrawal: Legislative Environmental Impact Statement (DIRS 103472-USAF 1999, all) 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, all) discussed system malfunctions or material failures that could result in either an accidental release of ordnance or release of a practice weapon. The Special Nevada Report (DIRS 153277-SAIC 1991, all) stated that the probability of dropped ordnance that resulted in injury, death, or property damage ranges from about 1 in 1 billion to 1 in 1 trillion per incident, with an average of about 1 in 10 billion per incident. Less than one accidentally dropped ordnance incident is estimated per year for all flight operations over the Nevada Test and Training Range and Naval Air Station Fallon. Spent nuclear fuel transportation would not affect the risk from dropped ordnance or aircraft crashes. Therefore, the Repository SEIS 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

not reasonably foreseeable. Therefore, there would be no need for associated mitigation measures and no impacts on military operations.

DOE based many of the impacts listed in Table 6-15 of the Repository SEIS on receptor locations identified by the State of Nevada in its report, A Mountain of Trouble: A Nation at Risk, Report on Impacts of the Proposed Yucca Mountain High-Level Nuclear Waste Program (DIRS 158452-Nevada Agency for Nuclear Projects 2002, p. 123). For example, the State identified receptors at 15, 20, 30, 35, 40, 100, and 160 meters from the rail line in Las Vegas; Table 6-15 in the SEIS specifically presents impacts for receptors at those locations. Therefore, DOE did not ignore evidence from the State; rather, it incorporated this evidence in the transportation impact analysis.

As discussed in Section 2.4.4 of the Repository SEIS, the Yucca Mountain FEIS evaluated perceived risk and stigma from construction and operations of a repository at Yucca Mountain and from the transportation of spent nuclear fuel and high-level radioactive waste. In the FEIS, DOE recognized that nuclear facilities could be perceived to be positive or negative, depending on the underlying value systems of the individual forming the perception. Thus, perception-based impacts would not necessarily depend on the actual physical impacts or risk of repository operations, including transportation. A further complication is that people do not consistently act in accordance with negative perceptions, and so a connection between public perception of risk and future behavior would be uncertain or speculative at best.

DOE concluded that, although it could measure public perception about the proposed repository and transportation of spent nuclear fuel and high-level radioactive waste, there is no valid method to translate these perceptions into quantifiable economic impacts. Researchers in the social sciences have not found a way to forecast linkages reliably between perceptions or attitudes reported in surveys and actual future behavior. At best, only a qualitative assessment is possible about what broad outcomes seem most likely. The Yucca Mountain FEIS identified studies that reported, at least temporarily, that a small relative decline in residential property values could result from the designation of transportation corridors in urban areas.

The Yucca Mountain FEIS presented the following conclusions about perceived risk and stigma:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods by which DOE could quantify such impacts 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.

An independent economic impact study (DIRS 172307-Riddel et al. 2003, all) conducted since the publication of the Yucca Mountain FEIS examined, among other things, the social costs of perceived risk to Nevada households near transportation routes. The study developed an estimate of households willing to accept compensation for different levels of perceived risk and to pay to avoid risk. The study indicated that, during the first year of transport, net job losses (and associated drop in residential real estate demand and decreases in gross state product) related to the baseline would occur in response to people who moved to protect themselves from transport risk. However, the initial impact would be offset rapidly as the

population shifted to a more risk-tolerant base. The results of this study are similar to those from studies that DOE identified in the Yucca Mountain FEIS.

Other conclusions of this study are that the public and DOE have widely divergent risk beliefs and that members of the public are very uncertain about the risks they face. At the same time, more than 40 percent of the respondents in a public survey conducted as part of this study felt that DOE information is reliable or very reliable, while another 40 percent feel that DOE information is somewhat reliable. These results suggest that DOE could mitigate social costs by reducing the risk people perceive from transport through information and education programs that are well researched and effectively presented.

While some scenarios could envision stigmatization of southern Nevada, it is not inevitable or numerically predictable. Such stigmatization would probably be an aftereffect of unpredictable future events, such as serious accidents, which might not occur. As a consequence, DOE did not quantify a potential for impacts from risk perceptions or stigma in the Repository SEIS.

1.6.2.7 (1267)

Comment - RRR000049 / 0004

The commenter recounted several rail derailments in the past, and stated that a derailment of a waste shipment would be something that has never been dealt with and, if it happened in Sacramento or Reno, the cities would be uninhabitable. The commenter also added that transporting the material would be inherently more dangerous than storing it on site.

Response

DOE disagrees that such a derailment would have dire consequences. There would be no release of radioactive material from the transportation cask in 99.99 percent of accidents; in only 1 out of 10,000 accidents would a release of radioactive material from a transportation cask occur. Therefore, for an accident in Sacramento or Reno, the most likely outcome would be no release from the cask. DOE would recover the transportation cask (see Appendix G, Section G.9.5 of the Repository SEIS).

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.6.2.7 (2490)

Comment - RRR000675 / 0023

The DOE is using data which identifies the least amount of expected transportation incidents to move spent nuclear waste from a generator facility to the repository. The Tribe would like to see the DOE utilize data showing worst case scenarios for transportation issues as well as best case scenarios. This will allow a true estimation of transportation incidents which will help local emergency responders understand the preparation and needs required in the event of an incident.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." In addition, the Repository SEIS is not a planning document for emergency response activities. Rather, tribes and other units of local government should use resources such as *Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents* (DIRS 156110-FEMA 2000, all) and the *National Response Framework* (DIRS -DHS 2008, all).

1.6.2.7 (2672)

Comment - RRR000692 / 0010

The Draft SEIS does not consider "worst-case" accidents in its NEPA analysis because such combinations of factors were considered "not reasonably foreseeable." Yet, the Draft SElS acknowledges that clean-up costs after a very severe transportation incident involving a repository shipment resulting in the release of radioactive material could range from $300,000 to $10 billion. The Final SElS should evaluate the impacts from a credible worst-case transportation accident or terrorist attack, as well as other accidents scenarios caused by human error.

A National Academy of Sciences (NAS) study recommended that detailed surveys of transportation routes for spent fuel be done to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration, fully engulfing fires and that steps should be taken to avoid or mitigate such hazards. The Final SEIS should identify the shipping corridors and include route-specific analyses that identify potential hazards along shipment routes. The risk analyses should include the potential consequences of a severe accident or terrorist attack involving extreme, long duration fire conditions that exceed package performance requirements. The Final SElS should also consider the impact of human error as well as the potential for unique local conditions to exacerbate the consequences of accidents or terrorist attacks. Certain segments of possible routes in California could provide conditions in which an accident or terrorist attack could exceed the spent fuel packaging performance requirements. Two major highway accidents that occurred this year on California highways (one in the Bay Area and one in Santa Clarita tunnel fire) are being investigated to determine whether these accidents may have resulted in conditions, in particular fire temperatures and fire durations, which approached or exceeded packaging performance requirements. Similarly nearly half of the 16 historical severe accident scenarios that were examined in the NAS 2006 study on spent fuel transport safety occurred in California. The Final SElS should examine credible accident scenarios that could exceed packaging performance standards.

Response

Appendix G, Section G.9.4 of the Repository SEIS discusses accidents involving spent nuclear fuel casks in tunnels. Based on analyses performed by the NRC, the consequences of an accident involving a spent nuclear fuel cask in a tunnel fire such as the Baltimore Tunnel fire or the Caldecott Tunnel fire would be very small.

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

Section 6.3.4 of the SEIS discusses the consequences of sabotage events. The estimated consequences of a sabotage event that involved a truck cask would be 0.055 latent cancer fatality for the population in rural areas and 28 latent cancer fatalities for the population in urban areas.

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

DOE also updated Section G.9.6 to provide a more-in-depth discussion of human error.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

1.6.2.7 (3014)

Comment - RRR000120 / 0002

The commenter pointed out that there has been a least one radioactive waste transport accident per year since 2004. He asked if this happened now, how can we ensure safe transport in the future. He also asked if the computer models that DOE used predicted the accidents since 2004.

Response

Over the past 30 years, there have been no accidents involving a release of radioactive material from a spent nuclear fuel cask. DOE used truck and rail transportation accident statistics and computer models to estimate accident risks in the Repository SEIS. In addition, truck and rail transportation accident statistics are often used to estimate risks of shipping nonradioactive hazardous materials. However, these models are most useful for predicting the number of accidents over long time frames, not the number of accidents over short periods, as suggested by the commenter.

1.6.2.7 (3170)

Comment - RRR000691 / 0055

Railroad Operations and Maintenance

The EIS is absent information concerning the safety records for both repository cask transportation schemes (Naval and Federal Railroad Administration).

Response

Appendix J, Section J.1.4.2.3.1 of the Yucca Mountain FEIS discussed transportation accidents involving radioactive material. From 1971 through 1998, there was only one transportation accident that involved a loaded rail shipment of spent nuclear fuel, and this accident did not result in a release of radioactive material from the cask.

1.6.2.7 (3181)

Comment - RRR000662 / 0030

The Draft SEIS (pages G-54 to G-55) ignores the evidence provided by the State of Nevada that unique local conditions could result in accident and incident frequencies and/or consequences greater than those evaluated in the Draft SEIS.

The “maximum reasonably foreseeable” accidents evaluated by DOE do not adequately represent the potential impacts of transportation accidents and incidents in Nevada. The Reno Rail Trench on the Union Pacific mainline is a prime example of a unique local condition that requires location-specific impact assessment in the Draft SEIS. DOE must consider the stigma impacts and public perception of risk, especially impacts on downtown tourism; accident prevention, security, and emergency response planning; probability and consequences of severe accidents; consequences of successful terrorist attack or sabotage, and the symbolic value of shipments through the Reno Rail Trench as a target for terrorist attack or sabotage.

Response

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than

1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

As discussed in Section 2.4.4 of the Repository SEIS, the Yucca Mountain FEIS evaluated perceived risk and stigma associated with construction and operations of a repository at Yucca Mountain and the transportation of spent nuclear fuel and high-level radioactive waste. In the FEIS, DOE recognized that nuclear facilities could be perceived to be positive or negative, depending on the underlying value systems of the individual forming the perception. Therefore, perception-based impacts would not necessarily depend on the actual physical impacts or risk of repository operations, including transportation. A further complication is that people do not consistently act in accordance with negative perceptions, and so the connection between public perception of risk and future behavior would be uncertain or speculative at best.

DOE concluded that, although it could measure public perception about the proposed repository and transportation of spent nuclear fuel and high-level radioactive waste, there is no valid method to translate these perceptions into quantifiable economic impacts. Researchers in the social sciences have not found a way to forecast linkages reliably between perceptions or attitudes reported in surveys and actual future behavior. At best, only a qualitative assessment is possible about the broad outcomes that seem most likely. The Yucca Mountain FEIS identified studies that reported, at least temporarily, a small relative decline in residential property values could result from the designation of transportation corridors in urban areas.

The Yucca Mountain FEIS presented the following conclusions about perceived risk and stigma:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods by which such impacts could be quantified 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.

An independent economic impact study (DIRS 172307-Riddel et al. 2003, all) conducted since the publication of the Yucca Mountain FEIS examined, among other things, the social costs of perceived risk to Nevada households near transportation routes. The study developed an estimate of households willing to accept compensation for different levels of perceived risk and to pay to avoid risk. The results of the study indicated that, during the first year of transport, net job losses (and associated drop in residential real estate demand and decreases in gross state product) related to the baseline would occur in response to people moving to protect themselves from transport risk. However, the initial impact would be offset rapidly as the population shifted to a more risk-tolerant base. The results of this study are similar to those from the studies DOE identified in the FEIS.

Other conclusions of this study are that the public and DOE have widely divergent risk beliefs and that members of the public are very uncertain about the risks they face. At the same time, more than 40 percent of the respondents in a public survey conducted as part of this study felt that DOE information is reliable or very reliable, while another 40 percent felt that DOE information is somewhat reliable. These

results suggest that DOE could mitigate social costs by reducing the risk people perceive from transport through information and education programs that were well researched and effectively presented.

While some scenarios can envision stigmatization of southern Nevada, it is not inevitable or numerically predictable. Such stigmatization would probably be an aftereffect of unpredictable future events, such as serious accidents, which might not occur. As a consequence, DOE did not quantify the potential for impacts from risk perceptions or stigma in the Repository SEIS.

1.6.2.7 (3646)

Comment - RRR000373 / 0003

The commenter stated that DOE should analyze and consider the accident record of the train company that would transport the waste.

Response

The shipment of spent nuclear fuel and high-level radioactive waste is highly regulated. For transportation of these materials to Yucca Mountain, DOE would meet or exceed U.S. Department of Transportation and NRC rules. DOE would also work with states, local government officials, federally recognized American Indian tribes, utilities, the transportation industry, and other interested parties in a cooperative manner to develop the transportation system.

As discussed in Appendix H, Section H.4 of the Repository SEIS, DOE has adopted as policy the practices it developed in consultation with stakeholders and has outlined in DOE Manual 460.2-1 (DIRS 171934-DOE 2002, all). The Manual establishes 14 standard transportation practices for Departmental programs to use in the planning and execution of shipments of radioactive materials, including radioactive waste. It provides a standardized process and framework for planning and interacting with state and tribal authorities and with transportation contractors and carriers.

Rail carriers must comply with Federal Railroad Administration regulations. The carriers are responsible for the training and qualification of their crews, including application of 49 CFR Part 240, Qualification and Certification of Locomotive Engineers, to operate over the district in which the train would move. The Federal Railroad Administration requires recurrent and function-specific training for personnel who perform specific work, such as train crews, dispatchers, and signal maintainers. Its regulations mandate recurrent training at a minimum interval of 3 years but training occurs at more frequent intervals for changed or redefined job functions or newer employees. The regulations require drug and alcohol testing of engineers and crew. They also require that all employees receive specific training directly tailored to job function. These regulations serve as a baseline set of requirements for the industry, and carriers often institute measures that exceed those requirements.

DOE has made the policy decision to ship most spent nuclear fuel and high-level radioactive waste in dedicated trains. Furthermore, the rail cars in these trains are required to have advanced braking systems and state of the art suspension systems that reduce the probability of an accident.

Rail industry rules, standards, and recommended practices that correspond with and in some cases enhance regulations promote compliance on the part of carriers in the area of rail safety (including crew training and preparedness and equipment inspection). In addition, safety and performance provisions are standard features of DOE contract carrier agreements, and provide another measure of assurance for consistency with regulatory requirements.

For spent nuclear fuel and high-level waste shipments to the repository, rail carriers would be responsible for maintaining a training program that addressed such areas as operation of the package tie-down systems, public affairs, first responder awareness training, and use of TRANSCOM. Carriers would also train crews for hazardous material handling in accordance with individual railroad operating rules.

1.6.2.7 (3699)

Comment - RRR000317 / 0007

The Study fails to address the risks to the railroad and railroad operations, and potential for release of toxic, high-level radioactive materials, resulting from geologic hazards along any alternative route, especially associated with roadbed erosion, failure and collapse due to geothermal activity along the Caliente Alternative Segment.

Response

DOE based the rail accident rates that it used to estimate risks from transportation accidents on derailments, collisions, and other causes. These rates would include accidents associated with all causes, including geologic hazards and roadbed erosion.

1.6.2.7 (3979)

Comment - RRR000121 / 0018

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Impacts to quality of life factors that make the community vulnerable to transportation accidents.

Response

The Department has evaluated impacts from transportation accidents. DOE is committed to continuing its Native American Interaction Program through directly involving tribes in cultural resource and ethnographic study efforts prior to repository facility and rail construction.

1.6.2.7 (3987)

Comment - RRR000108 / 0009

Moreover, should an accident or terrorist attack occur along certain segments of possible routes in California, the resulting fires could exceed the limits of the spent fuel package performance requirements. For example, two recent major highway accidents on California highways (one in the Bay Area and one in Santa Clarita tunnel fire) are being investigated to determine whether these accidents may have resulted in conditions, in particular fire temperatures and fire durations, which approached or exceeded the limits of packaging performance requirements. The potential for highway and rail accidents resulting in severe conditions is particularly significant in California considering that nearly half of the 16 historical severe accident scenarios that were examined in the National Academy of Sciences' 2006 study on spent fuel transport safety occurred in California. These accidents included extreme truck fires in highway tunnels, train derailments, and a rail accident involving a gas pipeline rupture. The Draft SElS should examine credible accident scenarios especially those which could exceed packaging performance standards.

The National Academy of Sciences study recommended that detailed surveys of transportation routes for spent fuel be done to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration and fully engulfing fires and further recommended that steps be taken to avoid or mitigate such hazards. To be comprehensive, the Draft SElS should identify the likely shipping

corridors and include route-specific analyses that identify potential hazards along shipment routes. It is vital that the risk analyses should include the potential consequences of a severe accident or terrorist attack involving extreme, long duration fire conditions that exceed package performance limits. It is equally important that the Draft SElS should consider the impact of human error as well as the potential for unique local conditions to exacerbate the consequences of accidents or terrorist attacks.

The Draft SElS does not consider worst case accidents because such combinations of factors were considered "not reasonably foreseeable". Yet, the Draft SElS acknowledges that clean-up costs after a very severe transportation incident involving a repository shipment resulting in the release of radioactive material could range from $300,000 to $10 billion. Having identified the upper range of clean-up costs, the Draft SElS should evaluate the impacts from a credible worst case transportation accident or terrorist attack that led to the high cost estimate.

Response

Appendix G, Section G.9.4 of the Repository SEIS discusses accidents involving spent nuclear fuel casks in tunnels. Based on analyses performed by the NRC, the consequences of an accident involving a spent nuclear fuel cask in a tunnel fire such as the Baltimore Tunnel fire or the Caldecott Tunnel fire would be very small.

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

Section 6.3.4 of the SEIS discusses the consequences of sabotage events. The estimated consequences of a sabotage event that involved a truck cask would be 0.055 latent cancer fatality in rural areas or 28 latent cancer fatalities in urban areas. The estimated consequences of a sabotage event that involved a rail cask would be 0.029 latent cancer fatality for the population in rural areas or 19 latent cancer fatalities for the population in urban areas.

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would

result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

DOE also updated Section G.9.6 to provide a more-in-depth discussion of human error.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

1.6.3 Repository Design

1.6.3 (70)

Comment - 4 comments summarized

Facilities

Commenters stated that DOE had not provided adequate justification for the need and size of the aging pads. Commenters also stated DOE had failed to locate key facilities such as the solid waste landfill, explosive storage area, borrow pits, and Cask Maintenance Facility and that the Department cannot perform an adequate impact assessment until it has selected geographic locations for them.

Response

Aging would be necessary to provide the operational flexibility to maintain an efficient flow of spent nuclear fuel to the repository from utilities and, at the same time, load waste packages within the repository temperature limits. The current Standard Contract does not allow DOE to dictate to utilities that oldest fuel be received first and, therefore, the Aging Facility would be necessary to allow operational flexibility. DOE has provided locations for supporting facilities such as the solid waste landfill, explosive storage area, borrow pits, and cask maintenance facility, and analyzed the impacts of these facilities in Chapter 2 of the Final Repository SEIS.

1.6.3 (73)

Comment - 11 comments summarized

Engineered Barriers

Commenters expressed concern that Yucca Mountain is an unsuitable geologic barrier and that DOE has, therefore, designed the repository with primarily engineered barriers. Commenters stated that to ensure adequate radiation safety, DOE must design barriers to last more than 300,000 years, and that Alloy-22 might not be the best choice of material for the drip shields. Others were concerned with DOE's decision not to install drip shields until approximately 40 years after emplacement of the final waste package. Commenters also stated that DOE should bound the repository analysis by not taking credit for the drip shields. Some commenters were concerned that DOE would ever install drip shields.

Response

The NRC regulations in 10 CFR 63 Section 63.113 require the repository to consist of multiple barriers, both engineered and natural, and provides performance objectives for how they should work together to limit radiological exposure to the public.

The repository design relies on three major barriers—two natural barriers and one Engineered Barrier System. The first natural barrier consists of the mountain, the soil, the rock, and other natural features of the mountain that prevent or limit water from reaching waste packages deep underground in the repository. This is the Upper Natural Barrier.

Engineered barriers are the man-made components of the repository designed to help the site's natural features protect the waste packages from water. The Engineered Barrier System includes the waste container, the repository design and construction, and additional equipment to cover and protect the waste package from damage.

DOE's proposal is to install drip shields and the license application reflects that proposal. The NRC's decision to grant construction authorization and to license DOE to receive and possess radioactive materials will be based on information contained in DOE's application and carefully considered by the NRC during the licensing proceeding. Accordingly, if the NRC were to grant construction authorization and license DOE to receive and possess radioactive materials on the basis of the present design to install drip shields, DOE would have to comply with that requirement.

Below the repository tunnels and between the Engineered Barrier System and the habitable environment there is another natural barrier - the Lower Natural Barrier. The Lower Natural Barrier also includes the soil, the rock, and other natural features of the mountain and the intervening land, between the mountain and the closest place that people could live, that prevent, filter out, or limit the amount of dissolved waste that could reach the habitable environment.

All three of these barriers contribute to the overall performance of the repository.

1.6.3 (74)

Comment - 19 comments summarized

Emplacement

Commenters expressed concern about the aging implications of the simultaneous construction of the repository and the storage and emplacement of waste. A commenter asked why doesn't DOE negotiate with utilities to ship the oldest waste first, thus removing the need for aging pads. Commenters also expressed concern with the adequacy of the ventilation system, the location of vents, and the use of carbon steel in the repository. A commenter wanted to know what kind of pollution would be created and where would it go. Other commenters asked about the design of emplacement drifts and emplacement drift components. A commenter suggested that spacing the disposal casks at 4-inch intervals would be problematic for retrieval and expressed concern over the temperature between drifts and the rock.

Response

Aging and Implications of Building, Storing, and Emplacing Waste Simultaneously: The aging of spent nuclear fuel would be necessary to provide the operational flexibility to maintain an efficient flow of spent nuclear fuel to the repository from utilities and, at the same time, to load waste packages within the temperature limits of the repository. The current Standard Contract does not allow DOE to dictate to utilities that oldest fuel be received first.

The Repository SEIS analyzes the impacts of waste receipt, handling, aging, emplacement, and monitoring with simultaneous surface facility construction and subsurface development (construction) in all resource areas. The SEIS defines the operations analytical period as the period that includes activities that would begin on receipt of a license to receive and possess radiological materials. The operations analytical period would include receipt, handling, aging, emplacement, and monitoring of waste and the continued construction of surface and subsurface facilities.

Ventilation: Development exhaust air would typically discharge through either the South Portal or the North Construction Portal, depending on the location of the area under development. The emplacement ventilation system would include fans on the exhaust shafts to draw air from the emplacement areas.

Section 2.1.2.2 of the Repository SEIS describes the exhaust stacks and ventilation system; Figure 2-4 of the SEIS shows the locations of the intake and exhaust stacks. Subsurface facility ventilation would consist of two operationally independent and separate systems for development and emplacement. The development ventilation system would be a supply system and would ensure the health and safety of subsurface workers. The emplacement ventilation system would be an exhaust system with the primary purpose of attaining thermal goals in the repository. Section 2.1.5 of the SEIS states that DOE would acquire performance confirmation data from the monitoring of ventilation exhaust.

During the construction period, exhaust from the exhaust stacks would consist primarily of particulate matter (PM_{10}; Repository SEIS Section 4.1.2.1) and naturally occurring radon-222 and its decay products (Section 4.1.7.2.2). During the operations analytical period, exhaust from the stack would consist primarily of naturally occurring radon-222 and its decay products. Manmade radionuclides from spent nuclear fuel would contribute about 0.1 percent of the dose impacts in comparison with those from radon-222 (Section 4.1.7.2.3).

Airborne releases of radon-222 and its decay products would occur from the subsurface exhaust ventilation air throughout the Construction, Operations, Monitoring, and Closure periods. The Repository SEIS assesses health impacts to the public from such releases. DOE would continually sample air from the subsurface exhaust on filters for periodic measurements. Continuous samplers on the subsurface ventilation exhaust shafts would remain in operation after the emplacement period until closure.

DOE has reasonable assurance that the nine shafts, together with the three ramps that would act as additional ventilation intakes, is sufficient to support ventilation of the repository. When an emplacement drift is fully loaded, the design-basis airflow rate to maintain thermal goals in the natural and engineered barriers would be 32,000 cubic feet per minute. This airflow rate is the basis for the ventilation system design, although the system would be able to provide airflow rates as high as 100,000 cubic feet per minute for cooling.

Carbon Steel and Vent Ducts. There is no specification for carbon steel for vent ducts.

Design of Emplacement Drifts and Emplacement Drift Components. The concern about the design of components in the emplacement drifts addresses the invert ballast, the waste package emplacement pallet, the drip shield, and the waste package. The DOE License application contains design details for these components. The License application also contains design details for the emplacement drifts, which are subject to adjustments during detailed design. The concern that emplacement drift designs should be final by now does not consider the fact that implementing policies and procedures of DOE, the Council on Environmental Quality, the EPA, and the NRC on the requirements of NEPA call for early evaluations in the process (for example, at the conceptual design phase) so the agency can make an informed decision before it expends large amounts of resources. DOE used the best available information to describe and

assess impacts from the emplacement drifts and emplacement drift components in the Repository SEIS. This information is sufficient to perform an adequate and meaningful evaluation of the project.

DOE assumes that the comment about the temperature between the spaces is a concern about the temperature of the rock between the drifts. During the operations analytical period, DOE would maintain ventilation in the drifts to manage the heat load in the repository and, thereby, the temperatures of the waste packages and rock walls. When DOE closes the repository, it will have modeled the temperatures in the rock wall over time, which would show an increase to a point above the boiling point of water. However, a portion of the rock pillar between two adjacent drifts would remain below the boiling point of water at all times in the future.

Spacing of Waste Packages and Waste Retrieval. Spacing between waste packages, not casks, would nominally be about 4 inches (10 centimeters) from end to end. This spacing is one dimension DOE used to achieve the thermal constraints specified for the repository. At the emplacement location, the transport and emplacement vehicle would emplace a waste package at a nominal spacing of 4 inches from a previously emplaced waste package. Operational steps would include travel of the transport and emplacement vehicle in the emplacement drift, final placement of the waste package and emplacement pallet in the emplacement drift, and travel of the transport and emplacement vehicle back to the entrance of the emplacement drift to return to the surface for transport of the next waste package. Normal waste retrieval would be the reverse of the waste emplacement process through the point at which the transport and emplacement vehicle exited the subsurface, so the 4-inch spacing would be unlikely to hinder waste retrieval operations.

Subsurface as an Interactive System. The subsurface facility is an interactive system, which is why it has built flexibility into many of the facilities and processes. For example, DOE would manage emplacement of waste packages in the drifts according to the thermal energy or thermal output of the individual packages and their respective impact on the surrounding rock. DOE would manage the thermal output of the waste packages by selecting for emplacement only those packages that would keep the temperature in the midpillar region below the boiling point of water. The Aging Facility would provide capacity for transportation, aging and disposal canisters and dual-purpose canisters to cool to the appropriate temperature before their placement in waste packages. The ventilation system would provide a range of operating modes for flexibility.

1.6.3 (1557)

Comment - RRR000325 / 0004

The commenter asked how DOE could propose aging pads at Yucca Mountain when the *Nuclear Waste Policy Act* prohibits an interim monitored retrievable storage site collocated in the same state as the repository.

Response

The use of aging pads does not constitute interim monitored retrievable storage. The Department's plans for the Aging Facility are consistent with applicable provisions of the *Nuclear Waste Policy Act.*

1.6.3.1 Yucca Mountain FEIS Design Evolution Issues

1.6.3.2 Transportation, Aging, and Disposal Canisters

1.6.3.2 (175)

Comment - 14 comments summarized

Feasibility of TAD Canisters

Commenters stated that DOE should not base the Repository SEIS analyses on the proposed TAD canister system. They stated that, because the TAD canister design is not final, no canisters exist for testing. There is so much uncertainty about which utilities would use these canisters that the analysis cannot reasonably determine the overall impacts of using the TAD system. Other commenters suggested the need for full-scale or real-life testing of the TAD system before its approval.

Response

DOE used the best available information on the TAD canister system to prepare the Repository SEIS. This information is sufficient to perform an adequate and meaningful evaluation of the project. The Department will evaluate potential changes under its *National Environmental Policy Act* (NEPA) implementing regulations and guidance, and will assess the need for additional evaluations under those processes and mechanisms. The suggestion that DOE must await the availability of additional more detailed design and operational details is not consistent with the requirements of NEPA and CEQ regulations.

DOE has issued its performance specification for the TAD Canister System (DIRS 185304-DOE 2008, all). The Department plans to contract with vendors that are qualified to prepare TAD system designs and submit them to the NRC for certification for at-reactor storage under 10 CFR Part 72 and for transportation under 10 CFR Part 71. The NRC should have TAD design applications for certification at the same time it will be considering the repository License application. DOE has based the license application on the performance specification.

The NRC performs ongoing research in packaging and transportation and publishes revisions to its regulations as necessary. The NRC would authorize and certify for transportation all casks that DOE would use to transport spent nuclear fuel consistent with the requirements and regulations in 10 CFR Part 71. For certification for transportation, TAD canister vendors would use models and techniques that manufacturers have used to gain NRC certification for existing, commercially available systems. DOE does not plan to conduct extraregulatory (that is, full-scale) testing on TAD systems.

1.6.3.2 (176)

Comment - 52 comments summarized

Insufficient Details about TAD Canisters

Commenters noted that the Draft Repository SEIS proposed the use of a TAD canister system and that the design of the TAD system is not complete. Further, the commenters stated that the Draft SEIS did not provide sufficient details related to the TAD system.

Commenters suggested that, for completeness, the Final SEIS should include:

- Justification for the 90-percent utilization rate DOE analyzed in the SEIS;

- Confirmation that DOE is not planning to use TADs to ship hottest fuel first;
- A description of how TADs would interface with each reactor site (or which reactors would not use them), including the need to transfer spent nuclear fuel from existing dry cask storage systems, the need for new equipment and facilities (what types and who pays), and who maintains the liability in the event of an accident;
- A description of how DOE would handle damaged fuel with the TADs;
- A description of how and where DOE would handle "rejected" TADs;
- How implementation of the TADs would affect workers' radiological exposure and risks in comparison with a non-TAD system;
- Detailed analysis of the risks and impacts (radiological and other) to reactor workers, the surrounding communities, the environment, and the populations along the transportation corridors;
- A full evaluation of alternatives if the TAD canister system proved unsuitable;
- The incentives DOE would use to convince utilities to use TADs; and

How the TAD would perform after emplacement

Response

The proposal for design and licensing of the Yucca Mountain Repository is that 90 percent of commercial spent nuclear fuel would arrive in TAD canisters. The license application addresses receipt of 10 percent of commercial spent nuclear fuel uncanistered or in dual-purpose canisters. Appendix A, Section A.2 of the Repository SEIS, includes a sensitivity analysis that assumes the receipt of 25 percent uncanistered or in containers other than TAD canisters.

TAD-based transportation systems would be certified under 10 CFR Part 71, and thermal limitations that would ensure adequate heat dissipation from the interior cavity would be similar to existing canister and bare spent nuclear fuel cask systems. As a practical matter, to use the full capacity of the TAD canisters these limits would probably require considerable aging of the spent nuclear fuel at reactors before shipment, which would limit the ability to adopt a hottest fuel first strategy.

Under the provisions of the Standard Contract between DOE and the nuclear utilities (10 CFR Part 960), spent nuclear fuel currently in dry storage system canisters is not an acceptable waste form and DOE would not accept it. However, DOE would consider mutually acceptable contract amendments that allowed the acceptance of spent nuclear fuel in canisters other than TAD canisters. Such spent nuclear could be shipped to Yucca Mountain, where it would be transferred into TAD canisters; the Repository SEIS describes the environmental effects of such transfers. Accordingly, the repository design has the flexibility to receive, age, and open dual-purpose canisters and transfer individual spent nuclear fuel assemblies from those canisters into TAD canisters underwater in a pool. The Wet Handling Facility would provide this capability. Further evaluation of design alternatives for unlikely contingencies is not necessary.

Loading and sealing of canisters at reactor sites would occur under the regulatory authority of the NRC and its reactor licensees. Radiation doses to workers would be within regulatory limits and likely to be similar to those with existing commercially available systems. Chapter 6, Section 6.2 of the Repository SEIS evaluates the health and safety impacts to workers and the public from loading TAD canisters at the reactor sites. DOE would contract with vendors qualified to prepare TAD system designs and submit them to the NRC for certification for at-reactor storage under 10 CFR Part 72 and for transportation under 10 CFR Part 71. DOE expects the NRC to have designs for certification at the same time it is considering the repository license application. The Department has based the license application on the performance specification. Once DOE accepted them, TAD canisters would not return to the origin sites.

Because DOE has chosen to involve canister-based system vendors and users in the development of TAD canister concepts, differences in required skills, equipment, or facilities should be minimal. DOE anticipates the nuclear sites would adapt to the TAD canister concept and make the changes necessary to integrate and accommodate these canisters.

The Proposed Action in the Repository SEIS includes the shipping of empty casks and TAD canisters to commercial and DOE sites, as well as loading of spent nuclear fuel and high-level radioactive waste at those sites for transport to Yucca Mountain. Loading activities would include preparing the spent nuclear fuel or high-level radioactive waste for shipment, loading it in a transportation cask, and placing the cask on a vehicle. Other activities would include the loading of commercial spent nuclear fuel into TAD canisters and the subsequent loading of those canisters in transportation casks. The SEIS includes the requested coverage of impacts of loading TAD canisters at reactors.

A discussion of incentives is outside of the scope of this SEIS.

The license application contains full consideration of the TAD canister as an integral component of the waste disposal package and DOE has factored it into the SEIS results.

1.6.3.2 (1457)

Comment - RRR000567 / 0001

The Department of Energy (DOE) has included the use of standardized Transportation, Aging, and Disposal Canisters, commonly referred to as TAD canisters, in the Draft Repository SEIS. The intent of the DOE is to supply TADs to each nuclear power plant where they would be loaded with spent fuel and shipped to Yucca Mountain.

The DOE's assessment assumes that 90 percent of the high-level waste coming into Yucca Mountain will be packaged in these containers. These containers have not been designed, manufactured or tested; and spent fuel continues to be placed into various other designs of spent fuel canisters licensed by the Nuclear Regulatory Commission. It is implied within the Draft Repository SElS that spent fuel from these various models of canisters will be repacked at nuclear power plant sites with spent fuel pools into the TADs. This would include spent fuel at Oyster Creek and Artificial Island in New Jersey.

In order to repackage this spent fuel, each loaded canister would need to be taken out of a dry storage module, heavy-hauled, then heavy-lifted up and into a spent fuel storage pool. The fuel rods would need to be emptied out of a perfectly useable canister and re-loaded into a TAD. The NJDEP believes this unnecessarily requires heavy load lifts and fuel handling, and ignores the usefulness of canisters that have been licensed for transportation.

The Draft Repository SElS fails to address what would happen to these emptied canisters and how much radwaste [radioactive waste] would be generated as a result of this operation.

Appendix A of the Draft Repository SEIS mentions that if 75 percent of spent fuel arrived in TADs, a second wet handling facility would be needed at Yucca Mountain. The DOE needs to delineate under what circumstances 75 percent is a reasonable number. The Repository SEIS needs to project how many canisters licensed for transportation would be stored around the country at various dates projected as possible operational dates for the repository. Then the needs for wet handling operations can be assessed.

Response

Repackaging fuel at the reactor sites is not part of the DOE's Proposed Action. The proposal for design and licensing of the Yucca Mountain Repository is that 90 percent of commercial spent nuclear fuel would arrive in TAD canisters. The license application addresses receipt of 10 percent of commercial spent nuclear fuel uncanistered or in dual-purpose canisters. Appendix A, Section A.2 of the Repository SEIS, includes a sensitivity analysis that assumes the receipt of 25 percent uncanistered or in containers other than TAD canisters.

1.6.3.2 (1556)

Comment - RRR000325 / 0003

Based on the transportation, aging, and disposal (TAD) canister approach, the commenter stated that DOE needs to explain completely how increased risks to workers and the public at reactor sites and how waste handling errors would worsen transportation impacts. DOE should explain the disconnect between its Global Nuclear Energy Partnership (GNEP) proposal to reprocess wastes and its current Yucca Mountain proposal to permanently seal wastes at reactors in TAD canisters.

Response

The impacts to workers and the public from loading TAD canisters are discussed in Chapter 6, Section 6.2 of the SEIS. The radiation doses to workers and the public from TAD canister loading activities at the reactor sites would be similar to the current radiation doses because nuclear utilities are already placing spent nuclear into dry storage canisters at their sites and the loading operations would be very similar.

The reactor site operator would load TAD canisters under its NRC license and in accordance with its 10 CFR Part 50 quality assurance program. DOE anticipates that waste handling errors would be very infrequent. Once DOE verified that the operator had met all requirements and accepted delivery of the waste, shipments would not return to the origin site. DOE would set aside shipments with discrepancies that arrived at the repository and implement action plans to resolve discrepancies and necessary licensing actions. There would be no transportation impacts due to waste handling errors.

The United States uses a once-through fuel cycle in which a nuclear power reactor uses fuel only once, after which the utility places the spent fuel in storage to await disposal. GNEP would establish a fuel cycle that would separate the uranium and transuranic materials from spent nuclear fuel and reuse them in thermal or advanced nuclear reactors. GNEP would not diminish the need for the nuclear waste disposal program at Yucca Mountain because, under any fuel recycle scenario, the resulting high-level radioactive waste would require deep geologic disposal.

1.6.3.2 (1640)

Comment - RRR000550 / 0016

There is no reason why nuclear waste should have to be repackaged to be stored in the repository. DOE SNF [spent nuclear fuel] containerization should be held to the same standard as at commercial nuclear sites.

Response

DOE has determined that commercial spent nuclear fuel in dry storage system canisters is not an acceptable waste form, because these canisters do not incorporate specific design features to address long term disposal processes. Therefore, commercial spent nuclear fuel in these canisters must be repackaged before disposal. In contrast, TAD canisters do incorporate these features and may be disposed. In addition, DOE spent nuclear fuel canisters have been determined to be acceptable for disposal.

1.6.3.2 (1744)

Comment - RRR000620 / 0009

Transportation, Aging, and Disposal (TAD) canisters are a valuable means of simplifying repository operations. However, it is also important that DOE has recognized that as much as 25 percent of commercial used nuclear fuel will be shipped to the repository in conveyances other than TADs to avoid the cost and radiation exposure associated with reloading dual-purpose canisters [dual-purpose canisters].

Shipping as much of the inventory of commercial used nuclear fuel in TAD canisters as possible will maximize the benefits of the operational simplification accrued from this concept. However, given the reality that a significant amount of commercial used fuel is and will continue to be placed in non-TAD systems prior to TADs becoming available, we find DOE's decision to consider, in this SEIS, the possibility that it might, in reality, receive up to 25 percent of the commercial inventory in non-TAD canisters (DSEIS Section 2.1.1) to be both reasonable and prudent. If DOE did not provide for the receipt of a significant amount of used fuel in non-TAD canisters, significant unnecessary costs and radiation exposure would have to be incurred to unload existing dual-purpose storage and transportation systems. Further, several decommissioned sites have already removed their used fuel pools and would be incapable of unloading already loaded systems even if such costs and exposures could somehow be justified.

There are currently 9,600 metric tons of used nuclear fuel in dry storage, in non-TAD storage and dual-purpose storage and transportation systems, and industry estimates that by 2012, the date at which DOE has indicated that it expects TAD canisters to be available, there will be approximately 13,600 metric tons of used nuclear fuel in dry storage. The current dry storage inventory represents 15 percent of the 63,000 metric tons of commercial used nuclear fuel that DOE has allotted as part of the 70,000 metric ton limit placed on it by the NWPA but only 7 percent of the 130,000 metric tons of commercial used fuel disposal capability DOE has provided for in the SEIS Inventory Modules I and 11. By 2012, the earliest date upon which DOE anticipates that TADs will be deployed in the commercial dry storage marketplace, the non-TAD storage percentages will rise to 21.5 percent of the NWPA allotment and 10 percent of the DSEIS evaluated capacity.

The numbers above indicate that DOE's objective of receiving no less than 75 percent, and perhaps up to 90 percent, of commercial used nuclear fuel in TADs, is achievable. For this to be accomplished, DOE must work diligently to [ensure] that the TAD development process can proceed as expeditiously as possible. Industry is interested in continuing to work with the Department on TAD development.

Response

Thank you for your comment.

1.6.3.2 (1792)

Comment - RRR000657 / 0006

Comment: Section 2.1.1, Page 2-9: This section describes scenarios of receiving 90 percent of the commercial used nuclear fuel in Transportation, Aging, and Disposal (TAD) canisters and an alternate scenario of receiving 75 percent of the used nuclear fuel in TAD canisters. DOE is commended for its plans to use TAD canisters to the extent practical and for analyzing a range of percentages of used nuclear fuel received in TAD canisters. The lower percentage (75 percent) appears to adequately bind the range that might reasonably be expected. Nevertheless, DOE should consider the option of receiving all used nuclear fuel in TAD canisters.

Resolution: The option of receiving all used nuclear fuel in TAD canisters may require intermediate packaging at a location other than the facility that generated the used fuel, but would greatly simplify operations at Yucca Mountain. The Yucca Mountain Repository would then be a radioactive contamination free facility because no individual fuel assemblies would be handled there. There are existing nuclear power facilities that receive used fuel from other facilities and have the capability to package that fuel in TAD canisters. In addition, potential savings of billions of dollars might be possible if there were no need to handle individual assemblies. Consideration should not be limited to building new repackaging facilities.

Response

A separate intermediate repackaging facility is not part of the Proposed Action for the SEIS, and has not been evaluated. However, existing nuclear power facilities would be free to consolidate repackaging activities at their own facilities and ship the resulting spent nuclear fuel to the repository in TAD canisters.

1.6.3.2 (1823)

Comment - RRR000622 / 0004

In the description of the use of TADs in repository operations, the SEIS states that TADS would be loaded at reactor sites where they would be sealed and never reopened. This would require all who handle the TAD from that point on to trust that the contents had been perfectly loaded and perfectly identified and described. A plan with no allowance for error in the most important aspect of the preclosure phase of the repository system is unrealistic and should not be pursued. Any worker at Yucca Mountain as well as transporters of the waste could pay the consequences for errors made by others. In addition to the workers and members of the public who have to rely on the proper identification and marking of the containers of irradiated fuel, the heat requirements inside the repository are also based on this data.

This scheme, based on perfection, has been adopted to reduce worker doses at Yucca Mountain. The danger in waste handling operations has not been eliminated; it has just transferred to workers at reactor sites who would be put at greater risk due to more waste handling. They would also be required to be responsible for carrying out the error-free, one-time waste identification and marking operation.

The conceptual design of the TAD specifies a container that would hold fewer assemblies than current dry casks now in use at some reactor sites. This makes the transfer of waste from current containers to TADs more difficult and dangerous because there would be “left over” fuel when an existing dry cask was emptied. Utilities and vendors may not be willing to accept this situation and if they are not, the TAD design will likely change. This would bring changes in all of the analyses regarding the TAD throughout

the SEIS. It would also likely change the percentage of waste shipped by rail, barge and truck. All of these considerations and calculations should have been done before the draft SEIS was released for comment.

Response

Loading and sealing of canisters at reactor sites would occur under the regulatory authority of the NRC and its reactor licensees. Radiation doses to workers would be within regulatory limits and would likely be similar to those with existing commercially available systems, even if the TAD canister holds slightly less spent nuclear fuel than dry casks currently in use. Chapter 6, Section 6.2 of the Repository SEIS evaluates the health and safety impacts to workers and the public from loading TAD canisters at the reactor sites.

DOE does not plan physical inspection of the contents of TAD canisters at Yucca Mountain. DOE has designed the repository to accommodate a wide range of waste forms. Waste is shipped in accordance with explicit waste acceptance criteria for specific waste forms and containers. Waste acceptance criteria include such criticality safety requirements as waste form, physical, chemical, and nuclear characteristics (for example, geometries, fissile material content, burnup). As presently planned, the repository's qualification program would delineate waste receipt inspection and verification to confirm that the incoming waste form met the waste acceptance criteria, minimizing the potential for unanalyzed event sequences. The pre- and postclosure safety analyses envelop the methodology and analyses to confirm that waste forms, which DOE has described in the license application. This administrative control will require the completion of similar analyses before the receipt of individual waste forms or waste package designs not analyzed in the license application.

DOE would contract with vendors qualified to prepare TAD system designs and submit them to the NRC for certification for at-reactor storage under 10 CFR Part 72 and for transportation under 10 CFR Part 71. NRC should have the designs for certification at the same time it is considering the license application. DOE has based the license application on the performance specification.

At reactor sites without direct rail access, DOE would explore the use of local (not in Nevada) intermodal transfers to enable the use of rail casks. Where reactors cannot handle and load TAD canisters, DOE could use shipments by truck or rail. Unloading of truck or rail size casks and repackaging spent nuclear fuel in TAD canisters would occur at Yucca Mountain. The Repository SEIS results include the shipment of trucks and rail casks to Yucca Mountain.

The number of assemblies in a TAD canister would be consistent with repository design features in the license application. While this could change in the future, it is the basis for the Repository SEIS assessment. The suggestion that DOE must await the availability of additional more detailed design and operational details is not consistent with the requirements of NEPA and CEQ regulations.

1.6.3.2 (1865)

Comment - RRR000525 / 0008

NARUC SEIS 2 Page S-4, S-10 Percentage of Commercial Spent Fuel to be Received in TAD Canisters

We understand the anticipated advantages in safety, cost-effectiveness and simplified operations to be gained by the shift to the use of TAD canisters under the revised concept of operations. We have concerns that the goal of 90 percent of spent fuel arriving at the repository in TAD containers may not be realistic due to the slippage in waste acceptance that has occurred and is likely to continue. There are over 40 independent spent fuel storage installations (ISFSIs) at reactor sites today and more will be

required since the cooling pool capacity will in most cases be exceeded by the amount of spent fuel discharged from the reactors. Since the TAD containers do not exist today and may not be available until 2011 or later, the surplus spent fuel, of necessity, will have been placed in sealed, non-TAD containers. It is our understanding that spent fuel in that form will still need to be shipped in non-TAD containers. We do not have access to the data on quantities that will be in that condition by the time the shipment schedule calls for each shipment to be made, but we suspect that it will be more than ten percent.

We are pleased to note the reference on page 2-9 to inclusion of a sensitivity analysis in Appendix A that considers the potential case that only 75 percent of commercial spent nuclear fuel could be placed in TAD canisters at commercial sites, with the remainder being loaded into TAD canisters at the repository.

The comment on page S-4 suggests that DOE may be flexible on the percentage of spent fuel being received in non-TAD containers. We urge that the surface handling facilities be of sufficient capacity for meeting forecasted waste acceptance flow rates.

Response

Thank you for your comment.

1.6.3.2 (2600)

Comment - RRR000241 / 0003

The commenter noted TAD canisters as a design change for the repository. Further, he stated that the use of TAD canisters would increase risks and impacts at reactor locations, and the Final Repository SEIS needs to address these risks and impacts. TAD canisters are not compatible with the current reactor storage facilities. TAD canisters can only be transported by rail or overweight trucks. There is no final design for TAD canisters.

Response

Loading and sealing of canisters at reactor sites would occur under the regulatory authority of the NRC and its reactor licensees. Radiation doses to workers would be within regulatory limits and would likely to be similar to those with existing commercially available systems. Chapter 6, Section 6.2 of the Repository SEIS evaluates the health and safety impacts to workers and the public from loading TAD canisters at the reactor sites.

TAD canisters and their associated overpacks are similar to dry cask storage systems currently used at nuclear utilities and as such are not incompatible with current reactor storage facilities. Like dual-purpose canister systems, TAD canisters would only be shipped by rail, and cannot be shipped by legal-weight or overweight trucks.

DOE used the best available information on TAD canister systems to prepare the Draft Repository SEIS. This information is sufficient to perform an adequate and meaningful evaluation of the project. The Department will evaluate potential changes under its *National Environmental Policy Act* (NEPA) implementing regulations and guidance, and will assess the need for additional evaluations under those processes and mechanisms. The suggestion that DOE must await the availability of additional more detailed design and operational details is not consistent with the requirements of NEPA and CEQ regulations.

1.6.3.2 (2658)

Comment - RRR000661 / 0006

The proposed Transportation, Aging and Disposal (TAD) canister system is central to the transportation system proposed in the Draft SEIS and represents a major change from transportation scenarios contained in the 2002 Final Yucca Mountain EIS (FEIS). The transportation impacts of the proposed action cannot be fully evaluated based on the information presented in the Draft SEIS. There are no final TAD canister and over-pack designs (at the time of Draft SEIS publication, only "proof of concept" designs existed).

TAD system costs and financial arrangements are unknown and not addressed in the Draft SEIS. The proposed TAD system is not compatible with dry storage systems currently in use at civilian nuclear power plants, and the impacts of this are not adequately assessed.

DOE apparently made the decision to build the revised repository design around the TAD system without ever having examined the transportation impacts of such a course of action. The Draft SEIS does not evaluate the TAD system against other alternative approaches despite the fact that there is no assurance that TADs can be utilized in the manner and to the extent DOE proposes. DOE made the TAD decision without NEPA documentation and without examining feasible alternatives.

DOE has provided no contingency plans for national transportation in the event that rail access to Yucca Mountain is not available, and the decision to base the transportation system on TADs requires rail transport. There are major uncertainties as to the future availability of rail access to Yucca Mountain, and the Draft SEIS does not evaluate alternatives in the event such rail access in not available.

Under the Proposed Action spent fuel from 68 specified commercial site origins would be shipped cross-country by dedicated train, mostly in TADs, to the proposed repository. (Appendix G, Tables G-4 and G-10, Figures G-3 through 47) As stated above, DOE should identify the programs, procedures and controls by which it intends to accomplish this objective.

Response

The suggestion that DOE must await the availability of more detailed design and operational information is not consistent with the requirements of NEPA and CEQ regulations. DOE has used the best available information in the Repository SEIS to evaluate the reasonably foreseeable environmental impacts of the Proposed Action.

The policies and procedures of DOE and CEQ that implement the requirements of NEPA call for environmental impact analyses early in the process of development of a proposed federal project. In particular, the need to prepare an EIS early in the process is stressed throughout the CEQ regulations (40 CFR 1500.5; 40 CFR 1501.2; 40 CFR 1502.5; and 40 CFR 1508.23). In addition, there are processes for determining if there is a need for additional NEPA analyses if there are significant and substantial new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

DOE plans for the rail line to be available before shipments of spent nuclear fuel and high-level waste began. If the rail line were not available, DOE would develop contingency plans before shipments begin, including any further NEPA analysis as appropriate.

If DOE did not select a rail alignment in the Caliente or Mina Corridor, the future course it would pursue to meet its obligations under the *Nuclear Waste Policy Act* is unclear at this time. DOE recognizes that other possibilities could be pursued, including evaluating the other three rail corridors to determine an

alignment for the construction and operation of a rail line to transport spent nuclear fuel and high-level radioactive waste to the repository at Yucca Mountain; these possibilities were analyzed in the Yucca Mountain EIS and in the Nevada Rail Corridor SEIS. Further consideration of these possibilities may require additional NEPA reviews, as appropriate.

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Section H.4.

1.6.3.2 (2680)

Comment - RRR000688 / 0075

The commenter is not satisfied with the 90 percent of spent nuclear fuel that DOE would receive at Yucca Mountain in TAD canisters and believes 75 percent is more accurate.

Response

DOE based the transportation impacts in Chapter 6 of the Repository SEIS on a scenario in which it would receive approximately 90 percent of spent nuclear fuel at the repository in TAD canisters. Appendix A, Section A.2 presents the transportation impacts based on a scenario in which the Department would receive approximately 75 percent of spent nuclear fuel at the repository in TAD canisters. The results of these analyses show that there would be very little change in the national transportation impacts if 75 percent of spent nuclear fuel arrived at the repository in TAD canisters rather than 90 percent.

1.6.3.2 (2826)

Comment - RRR000688 / 0041

The commenter stated that testing should occur on the cladding DOE states will be protected in storage and shipping.

Response

In the long-term performance assessment, DOE does not assume the cladding of commercial spent nuclear fuel would remain intact and has no bearing on the postclosure performance.

1.6.3.2 (2947)

Comment - RRR000688 / 0011

The commenter wanted to know what tests DOE would perform on TAD canisters when they arrived in Nevada to prove that what the utilities say they put in them are actually what is in them.

Response

Loading and sealing of TAD canisters at reactor sites would occur under the regulatory control of the NRC and its reactor licensees. DOE does not plan to perform physical inspection of the contents of TAD canisters at Yucca Mountain. The Department has designed the repository to accommodate a wide range of waste forms. Waste is shipped in accordance with explicit acceptance criteria established for specific waste forms and containers. Waste acceptance criteria include such criticality safety requirements as waste form, physical, chemical, and nuclear characteristics (for example, geometries, fissile material content, burnup). The repository qualification and quality assurance control programs would delineate

any waste receipt inspection and verification and confirm that the incoming waste form met the waste acceptance criteria, minimizing the potential for unanalyzed event sequences. The license application describes the methodology and analyses necessary to confirm that the preclosure safety analyses envelop the waste forms. This administrative control would require completion of similar analyses before the receipt of individual waste forms or waste package designs that the license application does not explicitly analyze.

1.6.3.2 (2948)

Comment - RRR000688 / 0010

The commenter stated that only 21 assemblies would fit in a canister and was concerned about where the additional 3 assemblies (from VCS-24 at Point Beach) would go.

Response

As reported in the Yucca Mountain FEIS (Table J-5), approximately 130 rail cask shipments would be part of the Proposed Action. The balance of the projected spent nuclear fuel (213 rail casks) would be part of Inventory Module 1. This spent nuclear fuel would be shipped in its current configuration and repackaged at the repository.

1.6.3.2 (3338)

Comment - RRR000235 / 0001

The commenter stated that the Final Repository SEIS should include the design for the TAD canisters. Without the final design for the TAD canisters, it is difficult to assess if they would affect the repository system, including transportation. The commenter indicated that the Final SEIS should include the final costs and financial details for the TAD canisters.

Response

DOE used the best available information on TAD canister systems to prepare the Draft Repository SEIS. This information is sufficient to perform an adequate and meaningful evaluation of the project. The Department will evaluate potential changes under its *National Environmental Policy Act* (NEPA) implementing regulations and guidance, and will assess the need for additional evaluations under those processes and mechanisms. The suggestion that DOE must await the availability of additional more detailed design and operational details is not consistent with the requirements of NEPA and CEQ regulations. Final cost elements associated with the TAD canister systems have not been released by DOE since this is procurement sensitive information.

1.6.3.3 Waste Package

1.6.3.3 (2333)

Comment - RRR000688 / 0060

The commenter stated that the use of dual-purpose canisters in conjunction with aging is really storage and storage is not allowed at Yucca Mountain. She also stated that dual-purpose canisters at a utility must be opened at the utility and put in a TAD canister.

Response

Repackaging fuel at the reactor sites or operating a separate intermediate repackaging facility is not part of the Proposed Action under the Repository SEIS and has not been evaluated. However, existing nuclear power facilities would be free to consolidate repackaging activities at their own facilities and ship the resulting nuclear fuel to the repository in TAD canisters.

Dual-purpose canisters are licensed for storage at existing nuclear power facilities. The Proposed Action includes receipt of dual-purpose canisters at the repository. These dual-purpose canisters may be managed within the Aging Facility prior to the dual-purpose canister being opened and unloaded in the Wet Handling Facility, where the nuclear fuel will be loaded into TAD canisters DOE would decontaminate empty dual-purpose canisters (shells) and process them as necessary to enable disposal as low-level radioactive waste.

1.6.3.3 (2903)

Comment - RRR000688 / 0019

The commenter stated that the use of a dual-purpose canister is not licensed for storage.

Response

Dual-purpose canisters are licensed for storage at existing nuclear power facilities. The Proposed Action includes receipt of dual-purpose canisters at the repository. The repository license would provide performance requirements for dual-purpose canisters to ensure consistency with the Preclosure Safety Analyses of 10 CFR Part 63. These dual-purpose canisters could be managed in the Aging Facility before the dual-purpose canister was opened and unloaded in the Wet Handling Facility, where the nuclear fuel would be loaded into TAD canisters.

1.6.3.3 (2942)

Comment - RRR000688 / 0016

The commenter is concerned about the process of using dual-purpose canisters for storage and then reuse. She wants to know what would happen to the discarded casks.

Response

There are no plans to reuse dual-purpose canisters; DOE would decontaminate empty dual-purpose canisters (shells) and process them as necessary to enable disposal as low-level radioactive waste off the Yucca Mountain site.

1.6.3.3 (2944)

Comment - RRR000688 / 0015

The commenter wanted to know if DOE would reuse aging overpacks and if so how it would decontaminate them.

Response

The repository license would provide performance requirements for aging overpacks to ensure consistent with the Preclosure Safety Analyses of 10 CFR Part 63. DOE could reuse overpacks if a subsequent TAD or other canister met the specific conditions for aging. One of these conditions would be that the exterior of the TAD or other canister was free of excessive nonfixed contamination. After removing the TAD or other canister from an aging overpack, DOE would radiologically survey the overpack interior to

demonstrate the absence of nonfixed contamination; decontamination would use standard industry practices described in the license application or in specific process procedures and instructions.

1.6.3.3 (2953)

Comment - RRR000688 / 0005

The commenter stated that the use of dual-purpose canisters in conjunction with aging is really storage and storage is not allowed at Yucca Mountain. She also stated that any dual-purpose canisters from utilities must be opened at the utility and put in a TAD canister. In addition, she stated that aging time limits need to be clearer. The commenter was concerned about the deterioration of the spent fuel assemblies (cladding, support structures, pellets, etc.). She requested testing on the transportation, aging, and disposal (TAD) canisters as they arrived in Nevada to ensure integrity. She stated that the oldest fuel should be shipped first. In addition, the amount of water used for decontamination of the canisters was a concern as well as the reuse of the canisters.

Response

Aging differs from monitored retrievable storage. DOE would receive bare spent nuclear fuel, and spent nuclear fuel in dual-purpose canisters or in TAD canisters, to cool as required before emplacement in the repository. The Aging Facility would provide a buffer between the rate at which the repository received spent nuclear fuel and the rate at which DOE processed the spent nuclear fuel into final waste packages. Without the Aging Facility, such cooling would have to occur at the generator sites. Even if generator site cooling occurred, a management of the differences between the rate of receipt and the rate of emplacement would be necessary.

Repackaging fuel at the reactor sites or operating a separate intermediate repackaging facility is not part of the Proposed Action under the Repository SEIS and has not been evaluated. However, existing nuclear power facilities would be free to consolidate repackaging activities at their own facilities and ship the spent nuclear fuel to the repository in TAD canisters.

DOE does not plan physical inspection of the contents of the TAD canisters at Yucca Mountain. DOE will perform a radiological receipt inspection of the transportation cask. The Department has designed the repository to accommodate a wide range of waste forms. Waste is shipped in accordance with explicit acceptance criteria for specific waste forms and containers. Waste acceptance criteria include such criticality safety requirements as waste form, physical, chemical, and nuclear characteristics (for example, geometries, fissile material content, burnup). As planned, the repository qualification program would delineate waste receipt inspection and verification and confirm that the incoming waste form met the waste acceptance criteria, minimizing the potential for unanalyzed event sequences. The license application describes the methodology and analyses necessary to confirm that the pre- and postclosure safety analyses envelop the waste forms. This administrative control would require the completion of similar analyses before the receipt of individual waste forms or waste package designs the license application has not explicitly analyzed.

A small percentage (much less than 10 percent) of spent nuclear fuel rods could have small cladding breaches (hairline cracks and pinhole leaks). These types of breaches are handled routinely under 10 CFR Part 71 and 10 CFR Part 72 licensing proceedings, and the license application considers them. A much smaller percentage of fuel assemblies have grossly damaged rods or are geometrically distorted or structurally compromised. The packaging of such assemblies for storage, transport, and disposal would be on a case-by-case basis. The Repository SEIS discusses the environmental impacts of this very small class of spent nuclear fuel.

The Standard Contracts between DOE and the reactor operators does not allow DOE to stipulate the characteristics of the waste the utilities ship; utilities are free to select the fuel assemblies they would deliver to DOE. All shipments would comply with applicable regulatory requirements regardless of the order of shipment.

There are no plans to reuse dual-purpose canisters; DOE would decontaminate empty dual-purpose canisters (shells) and process them as necessary to enable disposal as low-level radioactive waste off the Yucca Mountain site; water from such decontamination would be processed and made available for reuse.

1.6.3.3 (3619)

Comment - RRR000737 / 0007

The commenter recognized that the Draft Repository SEIS contains transportation analysis with risk factors, etc., but noted that there needs to be a discussion of the transport differences using TAD canisters. As an alternative, DOE should detail the analytical results using TAD canisters rather than the GA-4 or other transportation casks it has used as representative for transportation analysis, routing exposure, accidents, and sabotage.

Response

The Multi-Purpose Canister (MPC) System that DOE considered in the 1990s was similar in concept to the TAD system the Department is developing. Under both systems, DOE would encapsulate spent nuclear fuel in a sealed canister that it would not reopen. The canister in both systems would have various overpacks to meet regulatory requirements for at-reactor interim storage under 10 CFR Part 72, for transportation under 10 CFR Part 71, and for disposal. The SEIS presents the potential impacts of using the TAD system and transportation by environmental discipline throughout the document.

1.6.3.3 (3620)

Comment - RRR000737 / 0009

The dual-purpose container considered in the early 1990s appears to be very similar to the TAD. The dual-purpose container was dropped during the NEPA process from 1995 to 2000. DOE needs to explain why the dual-purpose container concept was dropped earlier but DOE appears to be returning to the concept.

Response

The Multi-Purpose Canister (MPC) System that DOE considered in the 1990s was similar in concept to the TAD system the Department is developing. Under both systems, DOE would encapsulate spent nuclear fuel in a sealed canister that it would not reopen. The canister in both systems would have various overpacks to meet regulatory requirements for at-reactor interim storage under 10 CFR Part 72, for transportation under 10 CFR Part 71, and for disposal.

DOE did not pursue the MPC System in the mid-1990s because of commercial issues associated with its design. Instead, the Department developed plans for a waste management system on the basis of acceptance and processing of bare spent nuclear fuel. This was evaluated in the Yucca Mountain FEIS. The development of the repository design made it apparent that the design of the bare fuel system had unanticipated complexities. Many complexities disappeared or became more manageable with the reintroduction of the canister-based approach.

1.6.3.3 (4033)

Comment - RRR000995 / 0014

The commenter suggested the need to clarify how DOE would have to modify existing cask designs to adapt to the use of TAD canisters and how modification of existing designs would compare to preparing new designs in relation to cost.

Response

Under the TAD Canister System performance specification (DIRS 185304-DOE 2008, all), DOE would contract with vendors qualified to prepare TAD system designs, including canisters, and submit those designs to the NRC for certification for at-reactor storage under 10 CFR Part 72 and for transportation under 10 CFR Part 71. The Department anticipates that the NRC would have the designs for certification at the same time it was considering the repository license application. TAD canister vendors have proposed the use of modified versions of existing NRC-certified cask designs to accommodate TAD canisters. Basing TAD canister designs on existing NRC-certified designs could reduce NRC design approval time and increase confidence in cask and system cost estimates.

1.6.3.4 Disposal

1.6.4 Repository Operational Plans

1.6.5 Repository Postclosure Performance

1.6.5 (45)

Comment - 3 comments summarized

Corrosion

Commenters stated that studies have shown that canisters have already begun to leak because of corrosion caused by moisture in the mountain and, therefore, DOE should keep spent nuclear fuel and high-level radioactive waste above ground and monitored.

Response

There is no nuclear waste at Yucca Mountain; neither are there waste containers of any type. The comment does not include sufficient information as to the studies referenced to provide any further response.

1.6.5 (56)

Comment - 5 comments summarized

Uncertainty

Commenters expressed concern about uncertainties associated with the DOE analysis of repository long-term performance. They stated that the uncertainties in the Draft Repository SEIS were very different from those that DOE presented previously and that they should include uncertainties associated with climate change.

Response

DOE recognizes that there are uncertainties associated with the analysis; this is why it used a method that is tailored to an analysis with uncertainties. The purpose of the Total System Performance Assessment (TSPA) model is to include uncertainties and characterize uncertainty in the results. This approach conforms to the approach mandated by the proposed NRC and EPA regulations, which include consideration of uncertainties. DOE has continued to refine the TSPA model since it completed the 2002 Yucca Mountain FEIS. The differences in the results of the TSPA analyses in the Final SEIS from those in the FEIS are largely attributable to the proposed NRC and EPA rules, which for the first time establish guidance on how to calculate repository performance during the period of ecologic stability. Section 5.3.4 of the Repository SEIS discusses the uncertainties and how the analysis handled them. Appendix F of the SEIS contains detailed plots, such as Figure F-3, that show the amount of uncertainty in the results. In the case of Figure F-3, there is about a 5-order-of-magnitude range of uncertainty.

The TSPA includes a comprehensive representation of future climate and weather patterns. Appendix F, Section F.2.2.1 and its referenced documents discuss the modeling of these patterns in detail.

During the site selection and licensing process, DOE has continued its research and gained more knowledge, which has led to continuous refinement of the TSPA. Equally important, however, is the fact that in the proposed EPA and NRC regulations, guidance was provided for the first time, as noted above, about how to perform a performance assessment extending through the period of geologic stability, which EPA defined as 1,000,000 years. Section 5.1 of the Repository SEIS discusses changes in the model and their impacts, including uncertainties associated with climate change. Following this guidance, the results presented by DOE in the SEIS address long term scenarios in a rigorous, structured manner, and the results are different. These differences, which are described in the text box in Section 5.5.1 of the SEIS, provide a basis for comparison of the SEIS to earlier results.

1.6.5 (57)

Comment - 4 comments summarized

Seismicity and Volcanic Activity

Commenters expressed concern whether the TAD canisters in the repository could withstand the test of time and not leak radioactive materials in a seismically active region and stated that the Final Repository SEIS should provide a remediation scenario for containers damaged in a major geologic event. Other commenters stated that the Final SEIS should acknowledge that an updated seismic analysis is currently underway and could have important effects on the modeling of disruptive igneous events and on the Total Systems Performance Assessment (TSPA).

Response

The TSPA model accounts for seismic and volcanic events in the related scenario classes (see Sections F.2.10, F.2.11, and F.4.2 of the Repository SEIS). The consequences of such events are included in the estimated impacts in Chapter 5 and Appendix F of the SEIS. The estimates of postclosure impacts take into consideration the seismic events, as well as the degradation processes in the oxidizing environment at Yucca Mountain. Over very long times, releases from the repository would be likely. These releases would be limited, however, because of the engineered systems will degrade slowly, and thereby only allow small releases of radionuclides over time. The analysis conservatively does not take credit for TAD containment after package failure because the DOE model assumes the TAD canister would have no corrosion resistance at the time the waste packages began to leak. Until package failure, there is no

degradation of the TAD canister and it strengthens the package so that packages with a TAD canister inside last longer. Therefore, the presence of the TAD canister is a factor but the expected lifetime of the TAD canister is not a factor in the TSPA results.

DOE will continue to acquire scientific information about the Yucca Mountain site throughout the repository lifetime, with a particular emphasis on data collected following construction authorization, if construction is authorized. The NRC regulations at 10 CFR 63.24 clearly describe the requirements for DOE to update its application. In particular, DOE must supplement its environmental impact statement in a timely manner so as to take into account the environmental impacts of any significant new information relevant to environmental concerns bearing on the Proposed Action or its impacts.

1.6.5 (58)

Comment - 10 comments summarized

TSPA

Commenters expressed concerns about the Total Systems Performance Assessment (TSPA) in the Draft Repository SEIS. These concerns included the fact that the most recent TSPA is different from those DOE previously presented and that the TSPA used to support the license application will probably be different still. Commenters noted that the Nuclear Waste Technical Review Board could not endorse the TSPA in the Draft SEIS because it did not consider all available data, was not calibrated with other site information, and did not consider probable significant evaporation. Commenters suggested that DOE tried to shortcut research to stay close to its schedule and might be using data from faulty models. Other commenters stated that DOE should consider other, more conservative, alternatives to the RMEI model used in the Draft SEIS that are plausible and would increase radionuclide concentrations in groundwater, thereby increasing impacts, by decreasing the amount of dilution. Still other commenters stated that providing impacts in terms of latent cancer fatality probability per person per year is deceptive and the increase in total latent cancer fatalities in the exposed population over the entire million years should be the key parameter in the Final SEIS. Commenters stated that the increase in risk allowed by the regulatory post-10,000-year limit is about 350 times higher than the pre-10,000-year limit and that DOE should have identified and documented this increase in risk (and latent cancer fatalities) in the Draft SEIS.

Response

Appendix F, Section F.2 (and its references) in the Repository SEIS describe the TSPA. The TSPA has continued to evolve as the Yucca Mountain Project progresses. There are differences between the current TSPA and that used for the Yucca Mountain FEIS. Chapter 5, Section 5.1 of the SEIS discusses these differences and their effects on impacts. The TSPA handles uncertainties that encompass what is known, how well it is known, and what is not well known. The methodology of the TSPA provides an assessment of how the knowns and unknowns are propagated into the level of uncertainty of results.

The NWTRB has voiced a concern about changes to DOE's infiltration model for the TSPA. DOE developed a new infiltration model to address potential concerns about traceability in the NRC licensing process. The new model is calibrated to site data, and has been validated consistent with the project's procedures. DOE is required to use the deep percolation rate the NRC prescribes for the long-term performance projections. Sensitivity studies show that infiltration is not a key parameter in estimating dose in the TSPA and regardless DOE is required to use the number the NRC prescribes.

The National Academy of Sciences has provided general guidance on prediction of the evolution of society. In its report, Technical Bases for Yucca Mountain Standards (DIRS 100018-National Research

Council 1995, all), the Committee on Technical Bases for Yucca Mountain Standards concluded that there is no scientific basis for predicting future human behavior. The study recommended policy decisions that specify the use of default (or reference) scenarios to incorporate future human behaviors in compliance assessment calculations. EPA based the RMEI on those recommendations. The analysis in Chapter 5 of the Repository SEIS generally follows the recommended approach, using as defaults societal conditions as they exist today and the assumption that populations would remain at their present locations.

DOE has described the risks for both the long term, including the post-10,000 year period, and the short term. A commenter noted the proposed long-term dose limit for the post-10,000 year period is 350 times the dose limit for the first 10,000 years after disposal. In fact it is only 24 times larger, and still within the ranges of risks NAS included in its report. The post-10,000 dose limit is about 1/3 of that of the action level that triggers Radon remediation. The Repository SEIS presents risks as individual latent cancer fatalities because uncertainties about size of population, lifestyle, and locations do not support an assessment of total population numbers.

1.6.5 (2832)

Comment - RRR000688 / 0038

The commenter wants to know the thickness of the Alloy-22 outer barrier and would it be available in such large quantities. She also wants to know how DOE would check vendors for quality assurance.

Response

The Alloy-22 outer shell would be 1 inch thick. Alloy-22 is a standard, widely used alloy that is available today; it could be manufactured in the required quantities. The supplier would have to manufacture and supply the shells under a quality assurance program that DOE would approve and audit.

1.6.5 (2902)

Comment - RRR000688 / 0020

The commenter asked if the tests of the “real” thing (not computer models) in the midpillar region would remain below the boiling point of water and that it would cause condensation of the steam at that location.

Response

The heater tests that have been performed over the past 8 years have verified that the models used for temperature calculations in the in-drift environment forecast actual conditions accurately. The models show that above boiling temperatures are projected to be sustained in regions around the drift for a period of 50 to 2000 years after closure. The drift wall surface at the crown of the drift is projected to peak at 150 degrees Celsius (302 degrees Fahrenheit). The temperature within the rock above the crown is projected to peak at 95 degrees Celsius (203 degrees Fahrenheit) which would be similar to in-pillar temperatures. The temperature in the rock just below the invert (crushed rock fill below the waste package) is estimated to peak at 120 degrees Celsius (248 degrees Fahrenheit) (DIRS 169860-BSC 2004, p. 6-85).

1.6.6 Repository Accidents

1.7 Existing Environment and Environmental Consequences

1.7 (1858)

Comment - RRR000525 / 0002

The 1999 Repository DEIS stated that, "The analyses in this EIS did not identify any potential environmental impacts that would be a basis for not proceeding with the Proposed Action." The proposed action is to construct, operate and eventually close a geologic repository at Yucca Mountain, including transportation of spent nuclear fuel and other high-level radioactive waste from present commercial and government storage sites.

After reviewing the changes in design and operational plans, changes in computer analysis tools and in the present and future environment in Nevada and other locations, this Draft SEIS concludes (page S-5l), "that the potential impacts associated with the design and operational plans are similar to impacts presented in the Yucca Mountain FEIS." We share that conclusion.

Response

Thank you for your comment.

1.7.1 Land use and Ownership

1.7.1 (1404)

Comment - RRR000656 / 0028

4.2.1.2.1/p 4-6

.. a four-lane access road from Highway 95 to the Gate 510...

Nye County advocates the early construction of access roads to the repository, and in other areas where needed. Such construction should precede rail construction and repository construction to facilitate the safe movement of employees and construction materials.

Response

In Section 4.3 of the Repository SEIS, DOE identifies the need to repair, replace, or improve certain elements of the infrastructure to help ensure safety under a high level of activity. The Department based these proposed safety improvements on assessments of the condition of the existing infrastructure; some parts of the infrastructure at Yucca Mountain are nearing, or in some cases have exceeded, their design and operational lifetimes. Because DOE has mandated operational restrictions on continued scientific activities, testing, and maintenance to maintain the safety of workers, regulators, and visitors, the infrastructure improvements would be necessary before construction of the Yucca Mountain Repository if DOE decided to lift current operational restrictions.

DOE agrees that increased use of the access road to the Yucca Mountain site would necessitate upgrading the road for safety. As part of infrastructure improvements, DOE proposes the building of new and replacement roads that would include a two-lane access road from U.S. Highway 95 at its intersection with Nevada State Route 373 to Gate 510. Section 4.3 of the Repository SEIS states that because the proposed infrastructure improvements would occur before construction of the repository, the potential

impacts would not be concurrent with those of construction and operations of the repository. It also states that if DOE did not implement these proposed infrastructure improvements in the near term, it would continue to operate the Yucca Mountain Project with the existing infrastructure and appropriate mitigation measures to protect worker health and safety, and would continue maintenance and replacement of infrastructure on an as-needed basis until the NRC decided to authorize construction of a repository at Yucca Mountain. Infrastructure upgrades that would facilitate construction of the repository and the railroad would take place in a manner that allowed for the efficient, cost-effective, and safe construction of the repository and railroad.

DOE provides the current levels of service for the highways surrounding the Yucca Mountain Site in Section 3.2.3 of the Repository SEIS. In addition, DOE evaluated the estimates for increased level of service on U.S. Highway 95 and State Route 373 and determined that the analysis did not justify improvements at this time (Appendix A, Section A.4 of the SEIS). Improvements to these highways would be under the authority of the Nevada Department of Transportation. In the future, if the Department of Transportation found it necessary to upgrade these highways, DOE would cooperate fully.

1.7.1 (1416)

Comment - RRR000656 / 0029

Section 4.2.1.2.1/p. 4-7: Ancillary facilities will be constructed to support the repository.

Nye County is in the process of identifying how various ancillary facilities can be incorporated into the community. Nye County appreciates the opportunity to be part of the DOE planning process to assure that such facilities are consistent with community goals. Facilities such as the training facility, Project Prototype Testing, Sample Management Facility, warehousing, and similar facilities are projected to be housed in the Crater Flat industrial park or the YMP [Yucca Mountain Project] Gateway development.

Response

The Repository SEIS discusses in Sections 3.1.1.1 and 4.1.1.2 that the BLM has designated for disposal a portion of the land south of the analyzed land withdrawal area and that Nye County has formally notified the BLM of the intent to purchase land for development that could host ancillary facilities. The SEIS also discusses the Nye County Yucca Mountain Project Gateway Area Concept Plan in Section 8.2.1 and states that Nye County views this plan as a starting point for development of the non-Geologic Repository Operations Area infrastructure, institutional capacity, and facilities to support the repository. DOE will continue to work with Nye County during the planning process for the ancillary facilities.

1.7.1 (1451)

Comment - RRR000867 / 0007

The draft SEIS states the area of land which would be disturbed is 2,200-2,300 acres. It should also reflect the land disturbance from implementing the Caliente railway alternative which is 14,000 to 15,000 acres—as well as additional acres needed for roads and any other activities.

Response

Section 1.4.1 of the Repository SEIS discusses land disturbance for the railroad. Section 6.4.1.3 of the SEIS also discusses land disturbance from the railroad and describes the physical setting for the railroad. The Chapter 4 land use section points to Chapter 6 for impacts to land use and ownership from construction and operation of a railroad in Nevada. Table 2-3 summarizes land disturbance caused by the railroad. Section 6.4.1.3 and Table 2-3 indicate that total surface disturbance for the Caliente

Implementing Alternative would be 14,000 to 15,000 acres and total disturbance for the Mina Implementing Alternative would be 9,900 to 12,000 acres. Table 2-6 summarizes the accumulated impacts of the Proposed Action (repository, national transportation, and construction and operation of a railroad in Nevada). It provides ranges of impacts that encompass impacts from the Caliente and Mina Implementing Alternatives. In addition, it identifies repository and Nevada transportation impacts that would occur in overlapping regions of influence.

1.7.1 (1577)

Comment - RRR000690 / 0040

Potential impacts to the Tribe's cultural relationship to lands that may be removed from tribal use and access due to the rail transportation route(s) and construction activities.

Response

Section 3.4 of the Rail Alignment EIS discusses treaty issues and American Indian interests. This section acknowledges that American Indian interests about environmental resources are not limited to archaeological or historic sites, but include natural resources and geological formations. Section 3.4.5 of the EIS acknowledges that American Indians are concerned the proposed railroad could cause substantial and large adverse impacts to their interests in and adjacent to the rail alignment regions of influence.

DOE will continue to solicit input from American Indians to identify the potential to affect cultural resources, discuss potential solutions, and avoid adverse impacts. DOE will comply with all regulatory requirements that protect American Indian interests and consult with tribes and protect their access to public lands that contain cultural resources.

1.7.1 (1683)

Comment - RRR000620 / 0014

Section 3.1.1.4, page 3-9, describes restricted area R-4808 as being part of the Nevada Test Site. Figure 3-2 shows area R-4808 extending beyond the test site boundary on the west. Either the text or the figure should be corrected.

Response

The cited text and figures in the Repository SEIS do not conflict. The airspace boundaries are different from the boundaries of the Nevada Test Site on the ground. The text describing aircraft hazards states, "The NTS airspace R-4808 is controlled by DOE for NTS activities and is not part of the NTTR."

1.7.1 (1767)

Comment - RRR000657 / 0014

Section 4.1.1.1, page 4-4: This section discusses impacts to land use and ownership from land withdrawal. The area of permanent land withdrawal proposed for the repository comprises nearly 150,000 acres, approximately 44,000 acres of which would be newly withdrawn land. As noted in the Nye County perspective (Section 8.6.2), the withdrawal of these lands would contribute to indirect cumulative impacts, which include the loss of the following: access to groundwater and mineral resources, access to industrial commodities (cinder, sands, and gravels), potential grazing lands, and recreational opportunities.

Nye County believes this incremental contribution to cumulative impacts can be successfully mitigated by allowing use of and access to these withdrawn lands, so long as the activities proposed would be

consistent with repository land use and operation. DOE, as the designated federal manager of the withdrawn lands, would have the authority to work with Nye County and local entities to ensure the successful management of lands. Add the following sentence to the last paragraph on page 4-4: "DOE will work in conjunction with Nye County, the situs jurisdiction, to identify other land uses that may be consistent with the terms of the land withdrawal."

Response

Section 4.1.1.1 of the Repository SEIS states, "DOE, in consultation with the U.S. Air Force and the Bureau of Land Management as appropriate, would manage the withdrawn land in accordance with the *Federal Land Policy and Management Act of 1976*, the conditions of the permanent legislative withdrawal set forth by Congress, and other applicable laws."

In addition, DOE has submitted draft legislation to Congress that would, among other things, permanently withdraw the lands necessary for the construction and operations of the repository in a manner that protected the health and safety of workers and members of the public and protect the environment. This legislation would require the Secretary of Energy to consult with the Secretaries of the Interior and the Air Force in preparing a management plan for the withdrawn lands. DOE would submit this plan to Congress and the State of Nevada. The draft legislation would provide the Secretary of Energy the authority to permit nonrepository-related uses of the land the Secretary considered appropriate, including domestic livestock grazing, hunting, and mining at the Cind-R-Lite patented mining claim. If this legislation passes, Nye County is welcome to provide DOE with proposals for nonrepository-related uses of the withdrawn lands that the Secretary could consider in preparing the management plan.

1.7.1 (3981)

Comment - RRR000121 / 0024

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Grazing rights from accidental radioactive release in transportation to the proposed repository or at the proposed Yucca Mountain site;

Damage to grazing range utilized by the tribe's cattle operation resulting in damage to the ranching economy of the tribe as contemplated in Article VI of the Treaty of Ruby Valley.

Response

Section 6.3.3 of the Repository SEIS analyzes the impacts of transportation accidents and Section 6.3.3.2 analyzes impacts of severe accidents. About 99.99 percent of transportation accidents would not be severe enough to result in a release of radioactive material or degradation of a cask's shielding. The 0.01 percent of accidents that could result in a release or degradation of shielding are known as severe transportation accidents. Based on the accident analysis, the transportation accident that is reasonably foreseeable and that would have the highest consequences would occur with a frequency of about 8×10^{-6} per year.

DOE developed the Caliente rail alignment to avoid American Indian lands. The closest rail line segment, common segment 5, would be approximately 2 miles east of the Timbisha Shoshone Trust Lands near Scottys Junction. For the Mina rail alignment, DOE developed the Schurz alternative segments in consultation with the Walker River Paiute Tribe to avoid Schurz and other populated areas on the Reservation. DOE acknowledges in Section 4.3.2.2.2.1 of the Rail Alignment EIS that because most

of the Reservation is rangeland, the rail line could cause a small reduction of land available for grazing and farming. In April 2007, the Walker River Paiute Tribe Tribal Council passed a resolution removing the Tribe from the DOE EIS process and will not allow the transport of nuclear waste by rail through the Reservation. If DOE selected the Mina rail alignment, it would seek to obtain a right-of-way across the Reservation in accordance with 25 CFR Part 169 (Right of Way Over Indian Lands). Under this regulation [25 CFR 169.3(a)], "No right-of-way shall be granted over and across any tribal land, nor shall any permission to survey be issued with respect to any such lands, without the prior written consent of the tribe."

Section 3.1.1.3 in the Repository SEIS and Section 3.4.3 of the Rail Alignment EIS discuss the Ruby Valley Treaty as it relates to the Yucca Mountain Project.

Railroad construction would result in surface disturbance across a number of grazing allotments on BLM-administered land. However, individual rail line segments would result in less than a 2-percent loss of animal unit months across all affected allotments for either rail alignment. DOE has developed mitigation measures and best management practices to mitigate impacts to grazing ranges, including compensation or range improvements for the direct loss of crops, pastures, rangelands, or reductions in animal unit months. The Department has revised Chapter 7 of the Rail Alignment EIS to state more clearly the process it would use to consult with affected permittees and BLM to minimize adverse impacts to grazing operations and compensate ranchers for rail line-related losses.

1.7.1 (4043)

Comment - RRR000671 / 0062

Page 3-4 3.1.1.1 Regional Land Use and Ownership—The text states that there are approximately 5,000 square kilometers (2,000 square [miles]) are Indian lands. The text does not provide a definition of Indian Lands and there is question about the accuracy of this statement. In addition, there are some land holdings that were acquired under previous provisions including the Indian Allotment Act under Bureau of Land Management that do not fall within reservations boundaries. The statistics used should reflect accurate information and therefore further research is needed and revisions to the text as determined necessary.

Response

Further research confirmed the presentation in the Repository SEIS. The Nevada Natural Resources Status Report (DIRS 181638-Nevada Department of Conservation and Natural Resources n.d., all) states the estimated amount of tribal acreage in Nevada is 1,161,865 acres or 1.6 percent of land in the state. This equates to 4,702 square kilometers. No change to the text is necessary.

1.7.1 (4044)

Comment - RRR000671 / 0063

Page 3-8 3.1.1.3—Treaty Issues—The text attempts to limit American Indian Treaty Issues to the Yucca Mountain area only and does not attempt to address the same information in the YMP [Yucca Mountain Project] Rail EIS. The CGTO does not agree with the statement and recommends that the text be revised to expand on the limitations imposed by the DOE to limit treaty issues only to Yucca Mountain and not to the proposed rail corridor as appropriate.

Response

Section 3.4 of the Rail Alignment EIS describes American Indian interests in the Proposed Action. Figures 3-242 and 3-243 of the EIS show the traditional boundaries and locations of federally recognized tribes and their relationships to the Caliente and Mina rail alignments. Section 3.4.3 specifically discusses treaty issues.

1.7.2 Air Quality

1.7.2 (1616)

Comment - RRR000690 / 0012

Although the EIS states that the release of nonradiological air pollutants, including cristobalite, resulting from depository construction will be well below EPA National Ambient Air Quality Standards, any release of additional air pollutants are of great concern to the Timbisha Shoshone. The EIS should include information concerning what affect, if any, the release of nonradiological air pollutants will have within the YMP [Yucca Mountain Project] study area, specifically within traditional Native American religious, cultural and gathering areas. Studies should include what affects non-radiological air pollutants may have on sensitive groups, such as elders and children.

Response

The *Clean Air Act* requires that the EPA design the National Ambient Air Quality Standards (NAAQS) to set limits to protect the health of "sensitive" populations such as asthmatics, children, and the elderly. Because the NAAQS consider the effects of criteria pollutants on elders and children, the comparison of nonradiological pollutants to the NAAQS did consider possible effects on these sensitive groups.

Section 4.1.7.1 of the Repository SEIS discusses impacts to occupational and public health and safety due to the release of nonradiological air pollutants. It describes public health impacts for naturally occurring hazardous materials, such as cristobalite, and for criteria pollutants (carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter). As stated in Section 4.1.7.1, there is no defined public exposure limit for cristobalite. An EPA health assessment (DIRS 103243-EPA 1996, pp. 1-5 and 7-5) states that the risk of silicosis is less than 1 percent for the cumulative exposure of 1,000 micrograms per cubic meter multiplied by years. Assuming a 70-year lifetime, the DOE analysis established a conservative annual average concentration of 10 micrograms per cubic meter as a benchmark for comparison. The estimated cristobalite concentration at the boundary of the land withdrawal area would be about 0.048 microgram per cubic meter, well below the 10 microgram-per-cubic-meter benchmark. Because the estimated cristobalite concentration would be less than one-half of 1 percent of the benchmark concentration, no effects would occur beyond the boundary of the land withdrawal area. Section 4.1.7.1 states that any public health impacts beyond the boundary of the land withdrawal area due to criteria pollutants would be small.

1.7.2 (2456)

Comment - RRR000681 / 0039

4.1.14.5.1 Air Quality. According to Table 4-33, the 10-year manufacturing period is for drip shields only. It is not clear whether all components of this process have been identified. It is also unclear whether the DOE has quantified emissions associated with the diesel generator facility, diesel fuel oil storage, and fueling station. A further question is whether this facility will emit more than 10 tons per year of a Hazardous Air Pollutant. DOE should also indicate whether the construction of this facility and

the subsequent manufacturing of the drip shields will be subject to a Maximum Achievable Control Technology requirement.

Response

As described in Section 4.1.14.1 of the Repository SEIS, DOE based the evaluation of environmental impacts from the manufacture of repository components on the premise that an existing commercial manufacturing facility or facilities would produce these items. There is no plan to construct a manufacturing facility at or near Yucca Mountain to produce these items. Because DOE cannot identify a specific manufacturing facility at present, the analysis used a representative (hypothetical) manufacturing site based on five typical existing facilities that produce items similar to the components (listed in Table 4-32 of the SEIS) the repository would need.

Available information on the communities in which the five existing facilities are located indicated prevalent conditions of nonattainment of ozone and $PM_{2.5}$ air quality standards. DOE assumed that the representative manufacturing site would be in an area that was in nonattainment of these standards. Therefore, DOE assumed that the primary concern for air emissions related to repository component manufacturing would be volatile organic compounds, nitrous oxides (as ozone precursors), and $PM_{2.5}$, and the evaluation emphasized those pollutants. The emission estimates in Table 4-33 of the Repository SEIS identify two different periods because the titanium drip shields would probably be manufactured later (with no overlap) than the components listed in Table 4-32. The evaluation did not attempt to determine if the existing manufacturing facilities had emission sources such as a diesel generator, diesel fuel oil storage, or fueling station, because the additional manufacturing load probably would not have a significant impact on emissions from such facilities. Further, there was no attempt to determine the type of regulatory permits or air emission control requirements at the existing facilities, because the evaluation assumed that such requirements would only lessen emissions from the facility (so the evaluation is conservative).

1.7.2 (2884)

Comment - RRR000688 / 0036

The commenter questioned how DOE would test the exhaust from the exhaust ventilation stacks on the crest of Yucca Mountain before release to the atmosphere.

Response

Section 2.1.2.2 of the Repository SEIS describes the Proposed Action for the exhaust stacks and ventilation system. The subsurface facility ventilation would consist of two operationally independent and separate systems: the development ventilation system and the emplacement ventilation system. The development ventilation system would be a supply system and would ensure the health and safety of subsurface personnel. The emplacement ventilation system would be an exhaust system with the primary purpose of attaining thermal goals in the repository. Section 2.1.5 of the SEIS states that DOE would acquire performance confirmation data from "monitoring of ventilation exhaust." DOE would continuously sample air from subsurface exhaust on filters for periodic measurements. Air sampling would use the methods and practices of ANSI/HPS N13.1-1999, *American National Standard Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities* (DIRS 152380-ANSI/HPS 1999, all).

During the construction period, exhaust from the exhaust stacks would consist primarily of particulate matter (PM_{10}) (Repository SEIS Section 4.1.2.1) and naturally occurring radon-222 and its decay products

(SEIS Section 4.1.7.2.2). During the operations period, exhaust from the exhaust stack would consist primarily of naturally occurring radon-222 and its decay products. Manmade radionuclides from the spent nuclear fuel would contribute about 0.1 percent of the dose impacts in comparison to those from the radon-222 during the operations period (see SEIS Section 4.1.7.2.3).

1.7.2 (3042)

Comment - RRR000681 / 0046

Yet another example is: "This Repository SEIS estimated that public exposures to cristobalite and public and worker exposures to erionite would be very small (DSEIS Summary, pg. S-30)." No qualitative or analytical basis for this claim is provided.

Despite significant attention to the issue of worker exposure to silica dust after the initial repository EIS and site recommendation, the DOE has once again ignored this critical worker safety and air quality issue.

Response

Section 4.1.7.1.1 of the Repository SEIS discusses the impact of cristobalite and erionite on workers and the public. Cristobalite is a form of crystalline silica (silica dioxide) and is one of the minerals that make up the rock DOE would excavate during repository construction. Erionite is an uncommon mineral that forms wool-like fibrous masses and occurs in rock layers below the proposed repository level.

Workers could be exposed to cristobalite by inhalation of airborne dust created during subsurface construction. DOE would use engineering controls during subsurface work to control exposure to silica dust. These controls would include the use of dust shields and air curtains on tunnel boring machines, water sprays, and isolated work areas. DOE would monitor the work environment to ensure that dust concentrations did not exceed the applicable limits for cristobalite. If engineering controls were unable to maintain dust concentrations below the limits, DOE would use administrative controls such as access restrictions or respiratory protection until the engineering controls could establish acceptable conditions. DOE would use similar controls, if necessary, for surface workers. Although DOE does not expect to encounter erionite layers at the proposed repository location and depth, the engineering controls for exposure to silica dust would apply to potential exposure to erionite. If there was an erionite encounter, DOE would seal off the area and evaluate remediation methods to eliminate worker exposure.

The public could be exposed to silica dust containing cristobalite outside the boundary of the land withdrawal area. However, as described in Sections 4.1.7.1.1 and 4.1.2.1 of the Repository SEIS, estimated annual maximum concentrations of cristobalite at the boundary of the analyzed land withdrawal area would be about 0.048 microgram per cubic meter. This is less than 0.5 percent of the benchmark annual average concentration of 10 micrograms per cubic meter over a 70-year lifetime. This is a conservative analysis. The analysis assumed that 28 percent of all fugitive dust from subsurface construction and the resulting rock pile would be cristobalite even though the cristobalite content of the parent rock ranges from 18 to 28 percent. Use of the parent rock percentage of cristobalite overestimates the airborne cristobalite concentration because studies of airborne crystalline silica have shown that most of the airborne material is coarse, not respirable, and that larger particles deposit rapidly on the surface (Appendix B, Section B.1 of the SEIS). Therefore, the 0.5 percent of the benchmark is an overestimate of the risk and the public exposure to cristobalite would be very small.

Section 3.1.8.3 of the Repository SEIS discusses health-related mineral issues that DOE identified during site characterization at Yucca Mountain. The discussion includes health risks for cristobalite and erionite. It describes the 2004 Silicosis Medical Screening Program for Yucca Mountain workers who were

involved in tunneling and underground operations between 1992 and 2004. In that program, DOE sent 6,228 informative letters, postcards, and invitations to participate in the screening program to affected individuals; 978 persons responded to the mailings; 551 persons completed a work history interview; and 414 of those interviewed underwent a medical examination. Two cases of silicosis were diagnosed during the screening examination, although one case had been diagnosed previously and reported as medical history. Neither case of silicosis could be attributed solely to exposure at Yucca Mountain because both workers had a long history of working in occupations that were dusty and likely to contain silica dust.

The DOE Computerized Accident/Incident Reporting System (CAIRS) compiles industrial accident statistics from DOE experience with activities similar to those that would occur at the proposed repository. DOE used the statistics in CAIRS to determine nonradiological industrial hazard impacts. The Department used incident rates for involved construction workers and noninvolved workers at DOE facilities during the past 5 years to calculate the industrial hazard impacts during repository construction. It used incident rates at the Savannah River Site, Idaho National Laboratory, and Oak Ridge National Laboratory—facilities that perform activities similar to the proposed repository—to calculate industrial hazard impacts during repository operation. It did not use the CAIRS database to determine radiological impacts.

1.7.2 (4141)

Comment - RRR000524 / 0025

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

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

Response

The estimated amount of lead that concrete batching would release is approximately 0.81 pound per year. The de minimis level for lead is 25 tons per year for conformity determination. (The de minimis level is the minimum threshold of emissions for which the determination must be performed). Concrete batching would be an insignificant source of lead and DOE did not consider it further. The Department has added additional description of lead emissions in Appendix B, Section B.1 of the Repository SEIS.

DOE used the AERMOD modeling system for the Repository SEIS rather than the Industrial Source Complex model because, since DOE published the Yucca Mountain FEIS, the EPA established AERMOD as its preferred air dispersion model for accessing criteria pollutants under the *Clean Air Act* (40 CFR Part 51, Appendix W). EPA specifies a preferred software model to ensure consistent air quality analyses for regulated activities, for preparing and reviewing new source permits, and for State Implementation Plan revisions. The EPA changed the preferred model because AERMOD provides better characterization of plume dispersion. According to 40 CFR Part 51, AERMOD "represents sound and significant advances" over the Industrial Source Complex model. The change became effective on December 9, 2005. Appendix B of the Repository SEIS describes the AERMOD modeling system.

1.7.3 Geology

1.7.3 (172)

Comment - 11 comments summarized

Geologic Faults and Seismic Risk

Several commenters stated that there are geologic faults and evidence of past seismic activity in the vicinity of Yucca Mountain. Some of these commenters stated that this suggests the potential for major catastrophic seismic events in the future, making Yucca Mountain an unacceptable location for a repository. Others wanted to know the types of studies that have been or are being conducted to demonstrate repository safety.

Response

DOE has performed extensive evaluations of the faults and associated seismic activity at Yucca Mountain and in the region. As part of those evaluations, the Department has characterized the seismic hazard of Yucca Mountain in terms of the probability of various earthquake magnitudes and the potential for movement along the various faults for those magnitudes.

As described in Section 3.1.3.2 of the Repository SEIS, the emplacement area of the proposed repository would lie between two block-bounding faults: the Solitario Canyon Fault to the west and the Bow Ridge Fault to the east. The block-bounding faults of the vicinity are where primary seismic movement has occurred over the last 12 million years. In the block between the Solitario Canyon and Bow Ridge faults are intrablock and subsidiary faults, but there is no clear evidence of any movement along these lesser faults during the past 1.6 million years.

In terms of future seismic hazards in the block where the repository emplacement area would be (see Section 3.1.3.3 of the Repository SEIS), DOE has concluded that these intrablock and subsidiary faults would be likely to experience displacement of more than 0.1 centimeter (0.04 inch) less than once in 100,000 years. DOE developed and implemented models to simulate the effects of seismic events on drip shields and waste packages from vibratory motion, drift collapse, and fault displacement, as well as changes to seepage rates, waste package degradation, and water flow patterns that could result from seismic events. The evaluations considered seismic events with an annual probability of occurrence of less than 1 in 10 million (the lower the probability of occurrence, the higher the magnitude of the potential earthquake). DOE incorporated the results of these analyses, described in Chapter 5 and Appendix F of the SEIS, in the overall estimation of the long-term postclosure performance of the repository.

1.7.3 (4199)

Comment - 2 comments summarized

Seismic and Volcanic Activity

Commenters stated concern that there could be seismic and volcanic activity over the life of the repository, and that the potential for the site to be submerged under water makes its location inappropriate for emplacing spent nuclear fuel and high-level radioactive waste.

Response

DOE has performed or supported many studies by recognized experts to characterize the nature of seismic and volcanic activity at Yucca Mountain. The Department has used results from these studies and other

available information along with recognized and accepted approaches to evaluate the probability of volcanic and seismic hazards at Yucca Mountain. Although DOE's evaluations have concluded that the probabilities are low, it has not dropped them from further evaluation. Chapter 5 and Appendix F of the Repository SEIS indicate that DOE incorporated the effects of potential seismic and volcanic events into the overall prediction of the long-term postclosure performance of the repository.

DOE evaluated the possibility that the repository would be submerged under water at some point in the future and concluded that a rise of groundwater to the level of the proposed repository would be very unlikely, and should not be assumed in DOE's assessment of repository long-term postclosure performance. As described in Chapter 3, Section 3.1.4.2.2, of the Repository SEIS, this conclusion is derived from the Department's study of historical groundwater levels based on mineralogical data, isotopic data, natural features at Yucca Mountain, and evidence of climate changes over the past few hundred thousand years. Results of these efforts indicate the water table might have been as much as 85 meters (280 feet) above the present level beneath Yucca Mountain during the past 1 million years, but even then still well below the level of the proposed repository. DOE has modeled the changes in groundwater levels that might occur if the climate changed to a much wetter climate than at present, and the estimated groundwater levels did not rise to the level of the repository.

1.7.3 (479)

Comment - RRR000396 / 0014

Section 3.1.3 Geology, pg 3-16

DOE provides a detailed discussion of Nye counties geological studies related to Yucca Mountain. Inyo County recommends that DOE add a third paragraph describing the County's geological studies related to Yucca Mountain.

Response

DOE revised Section 3.1.3 of the Repository SEIS to recognize the Inyo County work similar to the manner in which it described the Nye County work. Section 3.1.3 identifies a primary reference from the Inyo County efforts and the Inyo County Yucca Mountain Repository Assessment Office Internet site for additional information.

1.7.3 (482)

Comment - RRR000396 / 0015

Section 3.1.3.1.1 Site Stratigraphy and Lithology, pg 3-17

DOE should identify the source for the Paleozoic Era carbonate rocks at the Ue25P1 well. It should also include the stratigraphy and lithology from Nye County well 2DB, NPS wells GF-2A and 2B, and Inyo well BLM #1.

Response

Section 3.1.3.1.1 of the Repository SEIS identifies the older rocks as sedimentary, largely of marine origin. That is an adequate description for the source of the Paleozoic Era rocks.

DOE has added a sentence to the end of the first paragraph in Section 3.1.3.1.1 to indicate that both Nye County and Inyo County have completed boreholes into the carbonate rock to the south of Yucca Mountain. DOE made this change only for clarification; the text was correct in stating that only one borehole has been completed to these depths beneath Yucca Mountain.

DOE did not implement the suggestion to add stratigraphy and lithology from the other deep wells because that would represent information at a much greater level of detail than the rest of the discussion and is not necessary for an analysis and presentation of environmental impacts.

1.7.3 (483)

Comment - RRR000396 / 0016

Section 3.1.3.1.2 Selection of Repository Host Rock, pg 3-18

The DOE should add a fifth reason for selection of the Yucca Mountain repository site. Specifically, 5) the upward gradient of the LCA [lower carbonate aquifer] as a barrier to radionuclide transport.

Response

Although the upward gradient in the lower carbonate aquifer is one of many significant factors DOE considered in estimating the postclosure performance of the repository, it was not a criterion for selection of the host rock in Yucca Mountain. DOE did not make the suggested change to the Repository SEIS.

1.7.3 (484)

Comment - RRR000396 / 0017

Figure 3-5, pg 3-20

The white geological unit below Yucca Mountain should be identified on the figure and in the legend.

Response

The white area at the bottom of the simplified geologic cross-section in Figure 3-5 of the Repository SEIS (that is, it is not coded in the figure or the legend) represents nonspecific strata that is pre-Prow Pass; its identification is not necessary for the discussion. The Yucca Mountain FEIS and the original reference presented the figure in this manner. The FEIS identified strata below the Prow Pass Formation (the bottom layer in the figure; see Tables 3-7 and 3-17) as generally consisting of (from top down) the Bullfrog and Tram Tuffs (both of the Crater Flat Group), the Lithic Ridge Tuff, the Pre-Lithic Ridge Tuff, and older volcanics. These volcanics, with other interspersing layers in some locations, sit atop the Paleozoic Era rocks.

1.7.3 (2744)

Comment - RRR000688 / 0068

The commenter is concerned about unanswered questions on “high crustal strain rates.”

Response

DOE has expanded the discussion of strain in Chapter 3, Section 3.1.3.3, of the Repository SEIS to better characterize the nature of the apparent inconsistency in crustal strain rates. The SEIS now notes that differences between strain measured from geodetic stations and expectations from geologic data have been observed at locations around the world, including other locations in the Basin and Range. At present, this is a general, wide-ranging field of ongoing scientific inquiry and the scientific community is considering various possible reasons for these differences, including the possibility that some strain might be released aseismically (that is, without seismic activity) (DIRS 185127-Quittmeyer 2008, all) or that short-term irregularities in strain rates are simply not observable in the geologic record (DIRS 185128-Coppersmith 2008, all). The new strain data became available to the Probabilistic Seismic Hazards Analysis working group near the end of their deliberations. No member of that group has indicated that

changes to their conclusions were warranted. These new data also became available to the Probabilistic Volcanic Hazards Analysis working group. No member of that group has indicated that they used this information in their model development (DIRS 185335-Smistad 2008, all).

1.7.3 (2804)

Comment - RRR000675 / 0005

The Yucca Mountain Repository is located in an area which is susceptible to earthquakes. The Draft Repository SEIS basically states within its discussion of the seismic hazard on pages 3-22 and 3-23 that scientists are in disagreement over the crustal strain rates in the Yucca Mountain area. Many studies have been conducted by scientists to understand the amount of expected seismic activity in the area. The Tribe does not acknowledge those studies as being conclusive. In fact, not only does the Tribe not find the studies to be conclusive, but the authors of the Draft Repository SEIS state on page 3-23 that, "the recent findings have put the measured strain rates closer to expectations, but questions remain."

The Tribe does not understand how the DOE can determine the correct seismic design of the Repository, if it does not understand the seismic hazards it is trying to mitigate. The DOE is using data which identifies the least amount of expected seismic activity to build a repository of spent nuclear fuel and high-level radioactive waste. The Tribe would like to see the DOE utilize data showing worst case scenarios for seismic hazards. The health of our people, our land, our air and our water are at risk if an earthquake disrupts the "just get it done" science of the DOE.

Response

DOE has expanded the discussion of strain in Chapter 3, Section 3.1.3.3, of this Repository SEIS to better characterize the nature of the apparent inconsistency in crustal strain rates. The SEIS now notes that differences between strain measured from geodetic stations and expectations from geologic data have been observed at locations around the world, including other locations in the Basin and Range. At present, this is a general, wide-ranging field of ongoing scientific inquiry and the scientific community is considering various possible reasons for these differences, including the possibility that some strain might be released aseismically (that is, without seismic activity) (DIRS 185127-Quittmeyer 2008, all) or that short-term irregularities in strain rates are simply not observable in the geologic record (DIRS 185128-Coppersmith 2008, all). The new strain data became available to the Probabilistic Seismic Hazards Analysis working group near the end of their deliberations. No member of that group has indicated that changes to their conclusions were warranted. The new data also became available to the Probabilistic Volcanic Hazards Analysis working group. No member of that group has indicated that they utilized this information in their model development (DIRS 185335-Smistad 2008, all).

In relation to seismic design, DOE has added text to Section 3.1.3.3 of the SEIS to describe how it would incorporate seismic design into the repository systems, components, and facilities.

1.7.3 (3038)

Comment - RRR000681 / 0007

Throughout the DSEIS there are numerous examples where supporting references and documentation are not cited or incorrectly referenced. DOE's analysis does not incorporate the most updated information. One example of this is in section 3.1.3.3, DOE does not use the latest National Seismic Hazard Map.

Response

The site-specific probabilistic seismic hazard analysis is more authoritative for the Yucca Mountain site than results from the National Seismic Hazard Map. Because it focused on a smaller area, the site-specific effort could assess and include in its calculations many more faults and sources in the Yucca Mountain vicinity than the national map considered. Further, the ground motion characterization performed as part of the site-specific analysis produced prediction relations specifically for Yucca Mountain rather than the more generic ground motion characteristics for the national map. Therefore, DOE did not use the information in the National Seismic Hazard Map directly in detailed analyses of the Yucca Mountain Project, and determined that citations of information from and references to the national map provided no added value.

1.7.3 (3606)

Comment - RRR000142 / 0006

The EISs leave many concerns unaddressed. Seismic activity.

Response

DOE has performed or supported many studies by recognized experts to characterize the nature of seismic activity at Yucca Mountain. The Repository SEIS summarizes important elements from these studies (see Sections 3.1.3.2 and 3.1.3.3 of the SEIS), but it does identify key references that contain significant amounts of related information. To demonstrate the importance DOE places on the consideration of seismic activity at Yucca Mountain, Chapter 5 and Appendix F discuss that DOE incorporated effects of potential seismic events in the overall prediction of the long-term postclosure performance of the repository. DOE's analyses considered uncertainties by making conservative assumptions and using probabilistic analyses. The SEIS sections mentioned above address seismic activity concerns and provide references for more detailed information.

1.7.4 Hydrology

1.7.4 (89)

Comment - 24 comments summarized

Hydrologic Basin Beneath Yucca Mountain is a Closed Basin

Commenters noted that the hydrologic basin beneath Yucca Mountain is a closed basin. Further, many communities inhabit the basin, including the Timbisha Shoshone Tribe, and Death Valley National Park has nearly 1 million visitors a year. All of these people rely on groundwater for survival. A commenter stated that the Amargosa River, which is fed by all pathways on both sides of Yucca Mountain, is the third largest in the western United States, and parts of it run year-round above ground. Research by Inyo County, California, defines fast pathways (via the lower carbonate aquifer) from Yucca Mountain to area springs that many use for drinking water.

Response

DOE agrees with the characterization that the regional hydrologic basin in which Yucca Mountain is located is a closed basin (as described in Section 1.4.1 of the Repository SEIS) and that inhabitants and visitors rely on groundwater. The DOE analyses of environmental impacts specifically address the potential effects of the Proposed Action on groundwater and how those effects could affect public health and the environment. The Inyo County research, which DOE discusses in detail in Section 3.1.4.2.1 of

the Repository SEIS, included a model of groundwater flow to estimate what might happen if the upward hydraulic gradient in the lower carbonate aquifer was lost in the future. This model estimated that radionuclides would migrate down from the Yucca Mountain Repository and could travel as far as the deep carbonate aquifer. The implication is that contaminants in the carbonate aquifer could pose a different, potentially more problematic, migration scenario than the one DOE evaluated and specifically that contaminants from Yucca Mountain would have a fast pathway to springs in Death Valley.

Inyo County described its modeling effort as a "simple flow model" and noted that the travel time estimates vary greatly depending on the assumed transmissivity of the aquifer. DOE is not criticizing the effort, but it does have limitations. Inyo County used the model to point out the potential for a contaminant migration scenario that is important to the County.

Although DOE modeling of groundwater flow and contaminant migration did not include a scenario that involved the elimination of the upward gradient in the carbonate aquifer, its modeling to evaluate the long-term postclosure performance of the repository encompasses the scenario from the Inyo County efforts. The general conceptual model of the regional groundwater flow system in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. Both Section 3.1.4.2.1 (Environmental Setting) and Section 5.4 (Postclosure Repository Performance) of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be potential discharge areas for groundwater from beneath Yucca Mountain; that is, the results of groundwater investigations show the potential for radionuclides to migrate from the repository to Death Valley springs whether the upward gradient in the lower carbonate aquifer remains or not.

The travel time in the Inyo County flow model is basically within the large span of time estimated by the DOE transport model, although the DOE model estimates a much longer average or median travel time for contaminants after reaching the groundwater. Further, the Inyo County model does not account for the longer flow path involved in moving down to the carbonate aquifer, which would slow travel time. The county model also does not account for differing contaminant interactions with the rock that comprises the aquifer (in comparison with the overlying volcanic and alluvial aquifers), which would tend to slow the travel time further, at least for some radionuclides.

In summary, DOE's evaluation of postclosure contaminant migration from Yucca Mountain is not inconsistent with the Inyo County scenario. DOE determined the impacts in Chapter 5 of the Repository SEIS primarily for a reasonably maximally exposed individual at a location about 11 miles south from the repository (about 20 miles closer than the Death Valley springs). These impacts can be conservatively extrapolated to the springs in Death Valley.

With respect to the commenter's characterization of the Amargosa River, DOE agrees with most of the statement, but available information does not support characterization of the river as the third largest in the western United States. A fact sheet on the U.S. Geological Survey Internet site (http://pubs.usgs.gov/of/1987/ofr87-242) identifies the largest rivers in the United States and does not include the Amargosa River in any of its categories, which include longest, largest area of watershed, and largest average flow rate.

1.7.4 (150)

Comment - 2 comments summarized

Groundwater Analysis is Inadequate

Commenters described a legal issue between DOE and the State of Nevada about water use that occurred after publication of the Yucca Mountain FEIS. The commenters stated that the Yucca Mountain site is not suitable for use as a repository. As evidence, the commenters cited three points: (1) DOE knows rainwater percolates relatively quickly at the site, which would threaten the waste, and changed its own Site Suitability Guidelines just before it submitted a Site Recommendation in 2002 knowing that Yucca Mountain could not meet those guidelines, (2) DOE's inability to proceed quickly with a license application soon after the Site Recommendation, as demonstrated by more than 5 years of delay and DOE continuing to conduct studies of the site, and (3) DOE's attempt to rush the license application forward to take advantage of a "pro-Yucca dump Bush administration." The commenter stated that DOE should admit to Congress and the President that the Yucca Mountain site is not suitable and begin a scientific search for a suitable site.

Response

The legal dispute associated with DOE's use of groundwater since the completion of the Yucca Mountain FEIS is not within the scope of the Repository SEIS. Neither are items (2) and (3) in the comment. This response does not address these items further.

In relation to item (1), as DOE noted in the Comment-Response Document for the Yucca Mountain FEIS (p. CR-6), the Department did not 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 EPA (40 CFR Part 197) and the NRC (10 CFR Part 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. A key element in this case is the commenter's concern that rainwater would percolate relatively quickly through the proposed repository, which would risk fast corrosion of the waste containers DOE would emplace. DOE has described its findings and evaluations of water movement in the unsaturated zone at Yucca Mountain in this Repository SEIS and the Yucca Mountain FEIS. Section 3.1.4.2.2 of the SEIS contains the latest information on water movement in the unsaturated zone, including revised estimates of infiltration rates and the description of an unusual observation of a seepage event in a tunnel at Yucca Mountain as a result of an extremely high precipitation event. This event occurred in an area of the mountain that would be outside the emplacement drifts and below overlying strata that DOE anticipated to provide relatively quick travel routes. The Department incorporated this new information in the models that estimate the long-term postclosure performance of the repository summarized in Chapter 5 and Appendix F of the SEIS. The repository would operate within required parameters with acceptable exposure levels to a groundwater user at the reasonably maximally exposed individual location.

1.7.4 (4188)

Comment - 5 comments summarized

Groundwater Impacts to Death Valley National Park

Commenters stated that the groundwater analysis in the Draft Repository SEIS is inadequate as it relates to the lower carbonate aquifer and provides no meaningful assessment of impacts to the carbonate aquifer.

They also stated that DOE erroneously assumes that because the volcanic aquifers do not discharge into Death Valley National Park there would be no impacts to the Park. The commenters stated the belief that contaminated discharge from the carbonate aquifer, not the volcanic aquifer, could affect the Park. Commenters were critical of the fact that Figure 3-9 of the Draft SEIS omitted hydrographic areas in California.

Response

The Repository SEIS describes the best available information about flow paths in the saturated zone. The conceptual model of groundwater flow that DOE describes in Section 3.1.4.2.1 of the SEIS shows the plume from Yucca Mountain moving first into the volcanic aquifers, then south into the alluvial aquifer of Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. Sections 3.1.4.2.1 and 5.4 of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to the Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater starting in the volcanic aquifer beneath Yucca Mountain. Because of the strong link between the Death Valley springs and water from the lower carbonate aquifer, water starting in the volcanic aquifers does not appear to be the primary source for the springs. DOE has revised the text to be clearer.

In relation to impacts to Death Valley National Park, Chapter 5 of the Repository SEIS specifically describes potential impacts to the reasonably maximally exposed individual (RMEI) and, in relation to potential impacts at other locations, states (in Section 5.1.1.4):

"In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient from the RMEI location, it would be less likely that groundwater wells would capture all of the released radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS."

For the same reason, if the entire plume turned to the west in the Amargosa Desert and discharged to the Death Valley springs, impacts would be no greater than those described in the SEIS for the RMEI.

DOE has added text to Section 3.1.4.2.1 of the Repository SEIS to better describe the Inyo County efforts and to reference related documents that have become available since the Draft SEIS. DOE also revised Figure 3-9 of the SEIS to show California hydrographic areas.

1.7.4 (4189)

Comment - 6 comments summarized

Impacts of Groundwater Pumping Upper Gradient/Lower Carbonate Aquifer

Commenters stated the belief that the SEIS provides an inadequate analysis of the impacts of groundwater pumping and the effects such pumping could have on the upward gradient in the lower carbonate aquifer

because, if the upward gradient is degraded, future migration of contaminants could be affected. The commenters indicated that at a minimum DOE should consider present pumping rates and its impact on the upward gradient and radionuclide migration.

Response

The site-scale groundwater flow model that DOE developed and used to estimate impacts from the Proposed Action in the Repository SEIS incorporates its boundary conditions from the regional flow model, which is based on current recharge and discharge (including pumping) estimates. Specifically, the site-scale model includes effects from the current level of pumping in the Amargosa Desert area by considering the lower groundwater elevations along its southern boundary that are caused by pumping in the Amargosa Desert (DIRS 177391-SNL 2007, p. 6-5). The calibration of the model included adjustments to minimize the difference between observed and simulated water levels at many target locations along probable flow pathways (DIRS 177391-SNL 2007, p. 6-58), including those areas already affected by lowered groundwater levels from pumping. The current level of pumping in the Amargosa Desert, though significant, does not appear to have adversely affected the upward gradient in the lower carbonate aquifer; investigations (including those by Inyo County) have shown the upward gradient to be present under current conditions.

All the factors that DOE considered and evaluated in the TSPA modeling effort basically bound a scenario in which the upward gradient in the lower carbonate aquifer is reduced or eliminated. As part of the efforts to develop the TSPA model, DOE evaluated (DIRS 174190-BSC 2005, all) a wide range of features, events, and processes that could affect flow and transport in the saturated zone. The evaluation screened features, events, and processes for whether the model needed to include them. For example, one of the features, events, and processes was a significant [up to about 300-meter (1,000-foot)] decline in the water table (DIRS 174190-BSC 2005, pp. 6-32 to 6-34). DOE concluded that groundwater might have been this much lower during the past 11.6 million years based on investigations of geologic, fossil, and mineralogical records. The evaluation of this lower water table concluded that the greater distance of travel in the unsaturated zone, the lower permeability of the volcanic aquifer at lower depths, and the likely lower hydraulic gradient would all act to slow contaminant travel times under such a scenario. As a result, it concluded that the analysis did not have to carry this scenario into the evaluation of repository postclosure performance because it would not have an adverse impact on performance (that is, impacts would be smaller than those for the nominal case would).

DOE also evaluated the TSPA flow model through a wide range of parameter uncertainties to determine impacts in model results if parameter values changed. For example, one of the parameters run at different values was the relationship between horizontal and vertical permeability in the saturated zone, which was generally accepted to be in the range of 10 to 1 (that is, permeability in the horizontal direction is 10 times that in the vertical direction, causing water to move preferentially in the downgradient horizontal direction). In addition, DOE ran the model at a permeability ratio of 1 to 1, which is referred to as the removal of vertical anisotropy (DIRS 177391-SNL 2007, pp. 6-78 and 6-79). In this case, the modeled particles traveled deeper into the saturated zone, as would be expected, but the amount of material passing through specific boundaries did not change significantly from the base case. (The analysis noted that the 10-to-1 ratio base case model provided more accurate results in comparison with calibration points.)

Both of the example conditions involve scenarios in which contaminants would reach deeper in the saturated zone beneath Yucca Mountain than the nominal case scenario and neither resulted in greater impacts.

1.7.4 (4195)

Comment - 2 comments summarized

Groundwater Contamination Reaching Death Valley

Commenters stated concern about impacts to water resources and contamination in groundwater reaching Death Valley.

Response

As described in Section 4.1.3.1.2 of the Repository SEIS, there is a very low potential for radiological releases to occur during the repository construction, operations, monitoring, and closure analytical periods, and even lower potential for releases that could affect water resources. However, as described in Chapter 5 of the SEIS, DOE expects a gradual, slow release of radionuclides from the repository as the waste packages degraded over thousands of years, and these radionuclides would eventually reach the groundwater beneath Yucca Mountain.

The general conceptual model of the regional groundwater flow system described in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. However, Sections 3.1.4.2.1 and 5.4 of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater from beneath Yucca Mountain. DOE has studied, evaluated, and modeled the mechanisms and natural features that would be involved in the migration of radionuclides away from Yucca Mountain and estimates that even the reasonably maximally exposed individual using and consuming the groundwater would not be subjected to radiological impacts above regulatory limits.

1.7.4 (4197)

Comment - 2 comments summarized

Impacts to Water Resources from Radioactive Releases

Commenters express concern about impacts to water resources from potential radioactive releases.

Response

There is a very low potential for radiological releases during the repository construction, operations, monitoring, and closure analytical periods and even lower potential for releases that could affect water resources. However, as described in Chapter 5 of the Repository SEIS, DOE anticipates a gradual slow release of radionuclides from the repository as the waste packages degraded over thousands of years, and these radionuclides would eventually reach the groundwater beneath Yucca Mountain. DOE has studied, evaluated, and modeled the mechanisms and natural features that would be involved in the migration of radionuclides away from Yucca Mountain and estimates that even the reasonably maximally exposed individual using and consuming the groundwater would not be subjected to radiological impacts above regulatory limits.

1.7.4 (325)

Comment - RRR000091 / 0002

The commenter stated that the EISs do not address the lower carbonate aquifer and potential impacts to Death Valley and the American Indian tribes.

Response

The analysis described in the Repository SEIS bounds the impacts that would result if the plume reached Death Valley. The DOE model of groundwater flow estimates the plume from Yucca Mountain would move south into Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. The Repository SEIS recognizes in Sections 3.1.4.2.1 and 5.4 that groundwater flowing through the Amargosa Desert might contribute to the Death Valley springs to the west and, therefore, those springs could be potential discharge areas for groundwater from beneath Yucca Mountain. This water from beneath Yucca Mountain could contribute to Death Valley springs whether or not it reaches the carbonate aquifer in the area of Yucca Mountain. Without the upward gradient in the carbonate aquifer in the area of Yucca Mountain, it is likely that contaminant migration would be on a slightly different pathway. Although DOE modeling of groundwater flow and contaminant migration did not include a scenario that involved the elimination of the upward gradient in the carbonate aquifer, the modeling to evaluate the long-term postclosure performance of the repository is not inconsistent with that scenario. If the upward gradient was lost in the future, the flow path involved in moving down to the carbonate aquifer would tend to slow travel time. Further, differing contaminant interactions with the rock that comprises the aquifer (in comparison to the overlying volcanic and alluvial aquifers) would also tend to slow travel time, at least for some radionuclides. (That is, some radionuclides would tend to absorb onto the carbonate rock more than they would with either the volcanic or alluvial materials.) In general, a longer flow path and more opportunity for radionuclides to adhere to or absorb onto rock would result in smaller impacts at the downgradient receptor location.

Chapter 5 of the Repository SEIS does not specifically describe potential impacts to users of Death Valley springs or any water users beyond the reasonably maximally exposed individual (RMEI). However, because of the nature of the evaluation, its results can be extrapolated to other potential discharge or use locations. As described in Section 5.1.1.4 of the SEIS:

“In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient from the RMEI location, it would be less likely that groundwater wells would capture all of the released radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS.”

For this reason, if the entire plume turned to the west in the Amargosa Desert, whether or not it entered the lower carbonate aquifer before that point, and discharged through the Death Valley springs, estimated impacts would be no greater than those described in the SEIS for the RMEI would.

1.7.4 (396)

Comment - RRR000061 / 0002

The commenter disagreed with the Repository SEIS characterization of the region of influence containing no perennial streams or other permanent surface-water bodies and that precipitation and runoff are seldom sufficient to generate flowing water in drainage channels. The commenter criticized the SEIS for stating, "Yucca Mountain does not flow into any lakes, rivers, or oceans." In this regard, the commenter criticized the SEIS for not recognizing the Amargosa River, which the commenter characterized as "the third largest river west of the Mississippi" and that DOE essentially lost the river.

Response

Section 3.1.4.1.1 of the Repository SEIS describes the region as containing few perennial streams and other surface-water bodies. This section also describes the Amargosa River and its tributaries as draining Yucca Mountain and surrounding areas and recognizes that groundwater discharges feed short stretches of the river channel. The SEIS discussion of surface water at Yucca Mountain (Section 3.1.4.1.2) states that there are no perennial streams, natural bodies of water, or naturally occurring wetlands in the analyzed withdrawal area. DOE stands by these characterizations.

In relation to flow in washes at Yucca Mountain, Section 3.1.4.1.2 of the Repository SEIS states that flow is unusual, but flooding can occur as a result of intense summer thunderstorms or sustained winter precipitation. This characterization is appropriate for the drainage channels at Yucca Mountain.

In several places (for example, Sections S.1 and 1.4.1), the Repository SEIS describes groundwater beneath Yucca Mountain flowing into a closed basin from which it cannot flow to a river or ocean. This characterization is accurate. Groundwater does not flow from the closed basin through underground flow or any river and does not reach a river or ocean outside the basin. The Amargosa River is totally within the closed basin and is not an example of the condition being described. However, the Amargosa River is a significant drainage feature of the region outside the immediate area of Yucca Mountain. DOE did not lose it or otherwise delete it from the discussions.

With respect to the statement that the Amargosa River is "the third largest river west of the Mississippi," available information does not support this characterization. A U.S. Geological Survey fact sheet on the Internet (http://pubs.usgs.gov/of/1987/ofr87-242) identifies the Largest Rivers in the United States and does not include the Amargosa River as one of the largest rivers in the United States or the western United States in any of its categories, which include longest, largest area of watershed, and largest average flow rate.

1.7.4 (485)

Comment - RRR000396 / 0018

The first paragraph of this section does not reference Inyo County geological studies and well drilling data. The Final EIS should specifically reference Inyo's work in describing the Carbonate aquifers in the Death Valley region.

Response

DOE has revised later portions of Section 3.1.4.2.1 of the SEIS to describe the Inyo County studies and their results. However, DOE did not revise the first paragraph of Section 3.1.4.2.1 to address the Inyo County studies because the primary topic of the paragraph is the manner in which the Repository SEIS describes alluvial aquifers and the recognition that the description is a simplification. Because the focus

of the Inyo County studies was the lower carbonate aquifer, discussion of those studies in this paragraph would be out of place.

1.7.4 (486)

Comment - RRR000396 / 0019

Inyo County disagrees with the statements in the first paragraph at the top of page 3-29: "Although carbonate aquifers are regionally extensive, they are not necessarily extensively interconnected and often occur in compartments (DIRS Nye County Nuclear Waste Repository Project Office-NWRPO 2001, p. F53) that might or might not have a hydraulic connection to the carbonate rock in an adjacent compartment." First, the Nye County research does not accurately represent the regional data collected on the LCA [lower carbonate aquifer] by Inyo County and the NPS. Second, the USGS [U.S. Geological Survey] Death Valley Regional Groundwater model, publications by Winograd, USGS, and Inyo County's models of the LCA aquifer system indicate that the LCA is highly connected and provides a bases for inter-basin flow between the Amargosa Valley and Death Valley through the Southern Funeral Mountain range.

The second paragraph on page 3-29 should include a discussion on the observed regional upward gradient in the LCA with its contribution to the regional groundwater table.

Response

The intent of the cited paragraph in the Draft Repository SEIS was to describe the lower carbonate aquifer of the entire Death Valley Region (shown in Figure 3-7), not local (or subregion) findings in the Amargosa Desert-Furnace Creek area. Because there appears to be a difference of opinion on how "highly connected" the lower carbonate aquifer is on a regional scale, the text in the SEIS recognizes that investigators have differing views. When hydraulically connected, the carbonate aquifers provide a path for flow between groundwater basins.

In relation to the suggestion about the upward gradient in the lower carbonate aquifer, DOE discusses that topic in the Saturated Zone discussion of Section 3.1.4.2.2 of the Repository SEIS.

1.7.4 (487)

Comment - RRR000396 / 0020

Section 3.1.4.2.1 Regional Groundwater, Basins, pg 3-31

Paragraph three does not reference Inyo County in relation to groundwater conditions and movement in the Death Valley region. Belcher, 2004 and Bredehoeft, et. al., 2005 and 2007 groundwater models characterize groundwater flow through the Amargosa Valley basin. An explanation of this research should be included.

Response

DOE has revised the Basins discussion in Section 3.1.4.2.1 of the Repository SEIS to incorporate a summary of the Inyo County efforts documented in *Death Valley Lower Carbonate Aquifer Monitoring Program—Wells Down Gradient of the Proposed Yucca Mountain Nuclear Waste Repository* (Year One Project Report) (DIRS 185423-ICYMRAO n.d., all).

1.7.4 (488)

Comment - RRR000396 / 0021

Paragraph one provides a reasonable explanation of Inyo County's studies with [emphasis] on geochemical data. The County recommends the DOE include the results of Inyo's geological mapping, geophysical surveys, LCA [lower carbonate aquifer] monitoring wells, and numerical groundwater modeling for completeness.

The County disagrees with the last sentence of the first paragraph that states "However, water that moves south from the volcanic aquifers (such as Yucca Mountain area) is not a primary source for those discharges. Chemical modeling and groundwater models suggest some portion of waters from the Yucca Mountain area contribute to the flows to Death Valley."

A paragraph should be added after the first paragraph to discuss the LCA flow system.

Response

DOE has revised the Basins discussion in Section 3.1.4.2.1 of this Repository SEIS to incorporate a summary of the Inyo County efforts. However, the changes do not include the level of detail suggested in the comment because such detailed information would not be consistent with the current SEIS presentation, which consists of simplified summaries of available data.

The comment notes the County's disagreement with the last sentence of the Basins discussion in Section 3.1.4.2.1 of the SEIS about the contribution of water from the volcanic aquifer. The intent was to note that water from volcanic aquifers, although potentially contributing to Death Valley springs, does not appear to be the primary contributor. DOE has revised the text to improve clarity.

In relation to the County's suggestion to discuss the lower carbonate aquifer flow system, DOE has added text to summarize the Inyo County studies. Readers can find detailed information in the cited references.

1.7.4 (489)

Comment - RRR000396 / 0022

The discussion of water uses in the Amargosa Valley does not discuss the potential impacts of groundwater withdrawals from the Amargosa Farms area on the regional water table that includes Yucca Mountain. Some discussion on the findings of the Nevada States Engineer's Water Rights Ruling 5750 should be included.

DOE should ensure the perennial yields stated for the Amargosa Desert reflect the Nevada States Engineer's Water Rights Ruling 5750.

Response

The purpose of Chapter 3 of this Repository SEIS is to describe the affected environment, not to address potential impacts. Although Section 3.1.4.2.1 does not mention the Amargosa Farms area specifically, it describes the Amargosa Desert hydrographic area as overappropriated and, based on the State of Nevada's current position (Nevada State Engineer's Water Rights Ruling 5750), overpumped. Section 4.1.3 of the SEIS addresses potential impacts of the Proposed Action on regional groundwater resources.

DOE has included information from the Nevada State Engineer's Water Rights Ruling 5750 in a footnote to Table 3-4 and in the text of the Uses discussion in Section 3.1.4.2.1 of the Repository SEIS.

1.7.4 (492)

Comment - RRR000396 / 0023

Section 3.1.4.2.2 Groundwater at Yucca Mountain, Saturated Zone, pg 3-39

Inyo County agrees with the majority of the discussion presented in the second paragraph. However, the last sentence should be changed to state:

This is significant in the assessment of the postclosure performance of the proposed repository (see Chapter 5 of this draft SEIS) because it constrains the pathway by which [radionuclides] could move after repository closure providing the upward gradient in the LCA [lower carbonate aquifer] is preserved over time.

Response

Chapter 3 of the Repository SEIS identifies parameters of the environmental setting that are significant to the evaluation of impacts. Unless there is measured or otherwise observed evidence of change to these parameters, Chapter 3 does not speculate on changes. It would be speculative to postulate the scenario, or scenarios, that would result in loss of the upward gradient in the lower carbonate aquifer and if such a scenario would occur.

1.7.4 (493)

Comment - RRR000396 / 0024

Section 3.1.4.2.2 Groundwater at Yucca Mountain, Saturated Zone, Water Sources and Movement, pg 3-42

The first paragraph of Water Sources and Movement need to be qualified. The groundwater pumping referred to appears to be limited to only pumping at the Yucca Mountain repository site, which has relatively low and stable volumes of water for some time. However, the critical issue is the impact of the large scale regional pumping on the stability of water levels at Yucca Mountain. As discussed earlier, projections of current pumping in the Amargosa Valley for 1,000 years could [result] in a 3-meter drop in the water table below Yucca Mountain. This situation should be addressed the Final SEIS.

Response

The paragraph in question describes groundwater levels at Yucca Mountain. DOE considered (DIRS 174190-BSC 2005, all) a wide range of features, events, and processes that could affect the saturated zone in the Yucca Mountain area. These effects would bound the effects of the pumping scenario postulated in the comment.

1.7.4 (494)

Comment - RRR000396 / 0025

Inyo County disagrees with the last sentence of this section that states “The amount of inflow from the carbonate aquifer, if it exists, is unknown.” The thermal modeling of the upward gradient in Ue25p1 and the regional groundwater modeling of the LCA [lower carbonate aquifer] in the Yucca Mountain region shows that inflow from the LCA into the Tertiary aquifers exists. This section should be corrected to reflect the current data from the LCA studies.

Response

DOE has revised the text in Section 3.1.4.2.2 of the Repository SEIS to describe upwelling of water from the carbonate aquifer in the area of Yucca Mountain. According to the results of geochemical analyses of groundwater at Yucca Mountain described in the Saturated Zone Site-Scale Flow Model (DIRS 177391-SNL 2007), a small amount (generally less than 5 percent) of the water in the volcanic aquifer comes from the carbonate aquifer.

1.7.4 (532)

Comment - RRR000108 / 0006

California agencies, in a comprehensive review of the Draft EIS, in 2000 found serious deficiencies in DOE'S evaluation of groundwater and transportation impacts in California. California agencies identified potential groundwater impacts in the Death Valley region, impacts on wildlife, habitat and public parks, as well as transportation impacts in California from the repository. DOE is fully obligated under NEPA to provide a complete evaluation and disclosure of these impacts and provide adequate notice to the communities potentially affected by the proposed project. Groundwater flowing beneath Yucca Mountain discharges in springs to the south, including Furnace Creek Springs in Death Valley, California. This is a potential pathway for radioactive contaminants that may leak from the waste packages in the repository to reach these springs in Death Valley. The Draft SElS should better characterize regional hydrogeology in the Amargosa and Death Valley areas to evaluate groundwater flow and evaluate the potential impact from radionuclide contaminant migration toward aquifers in California. Further, the Draft SElS should propose mitigation measures, for example, a monitoring program to detect potential radionuclide migration from the repository into California aquifers.

Response

DOE has made appropriate notifications to communities that the Proposed Action could affect. The Department made initial notifications of its intent to prepare a supplemental EIS and for public scoping meetings, as described in Section 1.5.2 of the Repository SEIS. It then made notifications on the availability of the Draft Repository SEIS and on the schedule for public meetings, as described in Section 1.5.3 of the SEIS.

DOE summarized information on the regional groundwater flow system since the Yucca Mountain FEIS in Section 3.1.4.2.1 of the Repository SEIS. Much of the new information has been the result of investigations performed by Nye County, Nevada, and Inyo County, California.

The general conceptual model of the regional groundwater flow system described in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into the Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. However, Sections 3.1.4.2.1 and 5.4 of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater from beneath Yucca Mountain. As described in Section 9.2.2 of the SEIS, DOE would conduct preclosure monitoring at the repository to track the status and ensure adequate performance. After sealing the repository, DOE would conduct postclosure monitoring to continue to ensure acceptable performance. Details of this postclosure program would be established in an amendment to the NRC license because the program would not start until about 100 years after the start of operations. Deferring the details of this program to the closure analytical period would allow identification of technologies that might not be currently available.

1.7.4 (1614)

Comment - RRR000690 / 0013

The SEIS anticipates potential impacts to surface and groundwater to be small. However, the SEIS also spends a considerable amount of time discussing a potential impact to the YMP [Yucca Mountain Project] area water flow, specifically the Amargosa Desert, which may be interrelated to the Ash Meadows alluvial aquifer (see 3-32). This information and the discussion of potential contamination is of intrinsic concern to the Timbisha Shoshone because it maintains a 300 plus acre trust land area near the Ash Meadows aquifer which is within our home lands, situated in the heart of the Death Valley National Monument. The Tribe is concerned about any radiological or hazardous material contamination of available drinking waters at the YMP site for tribal members and the flora and fauna that drink these waters. Moreover, the Timbisha Shoshone are specifically concerned about any migration of polluted waters to the Death Valley trust lands, where a significant population of its membership reside, and to non-trust areas, where high percentages of members reside. Therefore, the SEIS is incomplete absent additional studies concerning impacts to both surface and ground waters, and potential contaminated water migration upon the Amargosa Desert and Ash Meadows alluvial aquifers.

Response

Chapters 4 and 5 of the Repository SEIS describe the primary impacts from the Proposed Action. Chapter 4 describes impacts associated with the construction, operations, monitoring, and closure of the repository; Chapter 5 addresses impacts associated with the long-term postclosure performance of the repository. The discussion of the affected environment in Chapter 3 of the SEIS provides sufficient information to support both impact discussions. As described in Section 4.1.3 of Chapter 4, impacts to surface water and groundwater would be small. The detailed discussion of the groundwater flow path from the Yucca Mountain area in Section 3.1.4 of Chapter 3 supports the Chapter 5 discussion of radionuclide migration.

The DOE model of groundwater flow estimates the plume from Yucca Mountain would move south into the Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. As described in the Basins discussion in Section 3.1.4.2.1 of the SEIS, water in this flow path would not move east into the Ash Meadows area because groundwater in Ash Meadows moves to the west. However, Sections 3.1.4.2.1 and 5.4 recognize that groundwater flowing through the Amargosa Desert might contribute to the Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater from beneath Yucca Mountain.

Although the postclosure repository performance evaluation in Chapter 5 of the Repository SEIS does not describe potential impacts to users of the Death Valley springs, because of the nature of the evaluation its results can be extrapolated to those discharge locations. As described in Section 5.1.1.4 of the SEIS:

“In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient from the RMEI location, it would be less likely that groundwater wells would capture all of the released

radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS."

For this reason, even if the entire plume were to turn to the west in the Amargosa Desert and discharged in the Death Valley springs, estimated impacts would be no greater than those described in the SEIS for the RMEI and well within regulatory limits for protection of the public health and safety and the environment.

1.7.4 (1874)

Comment - RRR000677 / 0017

DOE requires 430 acre-feet of water annually, primarily for its repository construction activities, but the Nevada State Engineer has denied DOE's water rights application for this appropriation. SEIS at 11-7. DOE acknowledges that its peak water requirements would draw down the aquifer during the first two years of construction. SEIS at S-24, S-26. Moreover, groundwater in the downgradient Amargosa Desert area is over appropriated but DOE concludes, because actual recent withdrawals have averaged half the total appropriations, the Yucca Mountain project there will create little, if any, environmental impacts. Id. at S-26.

DOE has chosen the Yucca Mountain site, in part, because it is in an arid environment. SEIS at S-7. But a desert environment also has negative consequences, such as an inadequate and unpredictable supply of water. DOE has not discussed any alternative plans to obtain water for construction and operations of the surface facilities and underground repository should the supply of groundwater prove inadequate or unavailable. The final EIS should address this issue.

The SEIS refers to the Southern Nevada Water Authority as the wholesale provider for southern Nevada's regional water needs. SEIS at 3-80. There is passing reference that Southern Nevada Authority is developing other sources of water from the Colorado River and elsewhere in Nevada. However, DOE fails to discuss southern Nevada Authority's controversial plan to acquire groundwater from an interstate aquifer, underlying Snake Valley in western Utah and eastern Nevada, and pipe it to southern Nevada. While DOE says that groundwater is the only source of available water for the repository, there is a finite amount of water to satisfy Nevada's evergrowing needs. Any water used for the repository must come out of this finite pool. Therefore, the SEIS should discuss southern Nevada's acquisition of water from the Snake Valley aquifer.

Response

As discussed in Section 4.1.3.2 of this Repository SEIS, existing water resources are adequate to support the actions at Yucca Mountain without significant impacts to water users in the downgradient area. As with all major construction projects, the building and operation of the repository would require an adequate supply of water. This water would be necessary for construction materials such as concrete, for control of dust, and for emergency use such as fire suppression. DOE submitted its application for the water in 1997. In 2000, the State of Nevada denied this request on the basis of state law, and the matter is the subject of litigation pending in Federal District Court in Nevada. The Department will continue to pursue the litigation, which is currently stayed by the District Court, and to work with the state to obtain the water necessary to support the repository program.

Section 3.1.11.1.1 of the SEIS describes efforts of the Southern Nevada Water Authority to identify water resource options, including some in White Pine County, the location of Snake Valley. In its summary of cumulative impacts for Nevada rail transportation, Section 8.4.2.6.1 of the SEIS identifies the Water Authority's efforts as a reasonably foreseeable action that could have a cumulative impact for the Caliente Rail Alignment. At this stage of the Water Authority's activities, the coverage in the SEIS is adequate. Further, DOE does not see these activities as having a direct relationship to the issue of obtaining water rights at Yucca Mountain other than recognizing that the need to obtain water is not an issue faced by DOE alone.

1.7.4 (2360)

Comment - RRR001078 / 0002

We are aware of differing viewpoints regarding the potential for spread and release of radionuclide-contaminated water in California's Amargosa River and Death Valley regions. The Department is concerned with the degradation of these vitally important desert water sources, and urges the Department of Energy to continue development of best management practices designed to reduce or eliminate this threat, in coordination with the County of Inyo and other stakeholders.

Response

DOE will continue its efforts to minimize potential impacts of repository construction, operations, monitoring, and closure as well as its long-term postclosure performance. As described in Section 9.2.2 of the Repository SEIS, DOE would conduct preclosure monitoring at the repository to track the status and ensure adequate performance. After sealing the repository, DOE would conduct postclosure monitoring to continue to ensure acceptable performance. Details of this postclosure program will be in an amendment to the NRC license because the program would not start until about 100 years after the start of operations. Because monitoring technology will undoubtedly evolve significantly during this time, it would not be reasonable to establish details of a postclosure monitoring program now.

1.7.4 (2365)

Comment - RRR000692 / 0005

Clean up or remediation plan for radionuclides surfacing at Alkali Flat/Franklin Lake Playa

The 2002 FEIS states that water from beneath Yucca Mountain surfaces at Alkali Flat and Franklin Lake Playa, and the 69,000 people could be exposed to contaminated groundwater. It is the DOE'S responsibility to implement a mitigation/remediation plan, and an evacuation plan should the repository suffer a catastrophic failure.

Response

The long-term risk to area residents and visitors from groundwater contamination would be very low based on the results of annual dose and groundwater performance analysis discussed in Chapter 5 and Appendix F of the Repository SEIS. Table 5-4 summarizes the estimated radiological impacts to the reasonably maximally exposed individual during the first 10,000 years after repository-closure and for the post-10,000-year period up to 1 million years. The values in Table 5-4 are well within the regulatory limits in the proposed EPA standards for protection of individuals.

During the active preclosure phases of the project, NRC regulations (10 CFR 63.161) require DOE to develop and be prepared to implement an emergency plan to cope with radiological accidents that could occur at the repository operations area. After sealing the repository, DOE would conduct postclosure

monitoring to continue to help ensure acceptable performance. Section 9.2.2 of the SEIS describes monitoring efforts that DOE would implement. DOE studies and models of postclosure performance, as described in Chapter 5 and Appendix F, indicate that impacts under even the most severe scenarios would be characterized by low quantities and slow increases of radionuclides in the groundwater pathway. DOE's postclosure monitoring would provide early detection of unusual conditions in the groundwater. As a consequence, there would be ample time to plan necessary corrective measures to protect the public.

1.7.4 (2450)

Comment - RRR000681 / 0035

6.4.1.6 Groundwater Resources. 150 to 176 new wells need to be drilled to meet demands of 6100 acre feet of water (7.5 billion cubic meters) required for the rail line. It is not clear where these wells will be located or how they might impact Clark County.

The following statement requires clarification: "DOE does not anticipate that proposed groundwater withdrawals would conflict with known regional or local aquifer management plans or the goals of governmental water authorities, and impacts from groundwater withdrawals on downgradient groundwater basins (or hydrographic areas) would be small." (6-33). How has DOE analyzed this issue to ensure that no conflict will present itself with governmental water authorities? Presently, the DOE is in litigation with the State of Nevada regarding the use and quantity of water for the Yucca Mountain project. It is not clear what measures the DOE [has] taken to resolve this issue, and how an adverse court ruling will impact the EIS.

"DOE determined that impacts to ground subsidence or groundwater quality that could result from railroad construction and operations along either rail alignment would be small." (6-34). It is not clear how DOE has quantified this, or what DOE's definition of "small" is.

Response

Section 6.4 of this Repository SEIS is a summary of the detailed evaluation of environmental impacts from the Rail Alignment EIS. For more information on impacts to groundwater resources from the construction and operation of a railroad in Nevada, refer to the Rail Alignment EIS and the Caliente and Mina rail corridors, respectively.

Figures in Sections 3.2 6 and 3.3 6 of the Rail Alignment EIS show the approximate locations of the proposed groundwater withdrawal wells.

Sections 4.2.6 and 4.3.6 and Appendix G of the Rail Alignment EIS discuss anticipated impacts from groundwater withdrawals necessary to support railroad construction and operation and describe the method DOE used to assess impacts of the proposed withdrawals on groundwater resources. Sections 4.2.6.2.1 and 4.3.6.2.1 of the EIS address the potential for the proposed groundwater withdrawals to cause land subsidence.

DOE has defined "small" when used to describe potential environmental impacts in several locations in the Repository SEIS and Rail Alignment EIS (for example, see Section S.3 of the Repository SEIS). A small impact is defined as a condition where environmental effects would not be detectable or would be so minor that they would not destabilize or noticeably alter any important attribute of the resource.

1.7.4 (2746)

Comment - RRR000688 / 0066

The commenter asked what blowdown from a cooling tower is.

Response

Industrial operations often include heat exchanger systems that use flowing water to remove heat from a process. This normally occurs in something like a radiator where the water does not contact the heated material, it only removes the heat. The hot water can be pumped to a cooling tower to dissipate the heat to the environment before being sent back in a loop to the heat exchanger. In the cooling tower, the hot water falls over surfaces to promote interaction with air and removal of heat. Because this process also promotes evaporation, makeup water is added to the system to keep it full. However, also due to evaporation, the amount of dissolved salts and solids in the water increases over time as water is lost. To keep dissolved salt concentrations down, water is periodically or continually bled from the system. This removed water with an elevated solids content is called "blowdown" and is generally considered to be wastewater. Because these processes are designed so the water is not contaminated (other than by heat), the blowdown is not contaminated; it contains higher concentrations of the same dissolved solids that were present in the clean water source.

1.7.4 (2747)

Comment - RRR000688 / 0065

The commenter stated that DOE should not use nonpotable water for decontamination.

Response

Use of nonpotable water would represent the most efficient use of resources. Using untreated or nonpotable water for activities such as decontamination would reduce the amount of water requiring treatment and the associated costs. If the untreated water was not suitable, DOE would incorporate necessary treatment or preconditioning.

1.7.4 (2753)

Comment - RRR000688 / 0058

The commenter stated that a long-term evaluation is needed on groundwater demands.

Response

Section 4.1.3 of this Repository SEIS discusses impacts of groundwater demand from the construction, operations, monitoring, and closure of the proposed repository, and states that DOE would require no water beyond those actions. Section 8.2.3 of the SEIS discusses impacts of groundwater demand in terms of other foreseeable actions that could be cumulative with those of the Proposed Action.

1.7.4 (2846)

Comment - RRR000675 / 0006

The Draft Repository SEIS states on page 3-29 that, "although carbonate aquifers are regionally extensive, they are not necessarily extensively interconnected and often occur in compartments." The Draft Repository SEIS goes on to say that, "When (carbonate aquifers are) hydraulically connected, carbonate aquifers provide a path for flow between groundwater basins."

The County of Inyo has gathered strong scientific evidence though geochemical analysis that the Lower Carbonate Aquifer has several discharge points on the western side of the Funeral Mountains in the Furnace Creek area of Death Valley National Park. The Lower Carbonate Aquifer lies underneath the Yucca Mountain Repository. Within the Draft Repository SEIS a study by the University of Nevada, Las

Vegas also concluded that groundwater from the Yucca Mountain region flows into Death Valley National Park.

The DOE is consistent in its stance that the groundwater beneath Yucca Mountain flows into a closed hydrogeologic basin. However, based on independent studies it is revealed that the groundwater beneath Yucca Mountain does flow into other areas, specifically Death Valley National Park. The Tribe believes that the Draft Repository SEIS should contain an impact assessment for plant life, wildlife, wildlife habitat and drinking water supplies in Death Valley National Park that could be impacted by migrating radionuclides from the Yucca Mountain Repository. The Timbisha Shoshone Tribe has homelands within the Death Valley National Park and they utilize groundwater for [its] domestic water supply. The SEIS should have considered the drinking water impacts, socio-economic impacts, environmental justice issues, transportation impacts and cultural impacts of the Timbisha Shoshone Tribe. The Tribe would like to see the DOE assess and evaluate the impacts which the repository will have in the Timbisha Shoshone Tribe. Furthermore, the Tribe would like the DOE to perform assessments on other areas which groundwater underlying the Yucca Mountain Repository may travel to.

Response

DOE has modified Section 3.1.4.2.1 of the Repository SEIS to describe differences of opinion on how interconnected the carbonate aquifer is on a regional scale. Some investigators believe the compartments of the carbonate aquifer often have no groundwater flow communication; others believe most compartments of the carbonate aquifer are connected and support groundwater flow. In either case, if there is a hydraulic connection, the carbonate aquifer provides a pathway for flow between basins, which was the primary point of the original text.

The general conceptual model of the regional groundwater flow system described in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south to the Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. Sections 3.1.4.2.1 and 5.4 of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater from beneath Yucca Mountain.

The closed hydrogeologic basin described in the Repository SEIS refers to the Death Valley regional groundwater flow system, of which Death Valley is the low point. Groundwater flow is toward the low point of the system; that is where the water goes unless it first leaves the ground at seeps or springs or by pumping.

Although the Postclosure Repository Performance evaluation summarized in Chapter 5 and Appendix F of the Repository SEIS does not describe potential impacts to users of Death Valley springs, because of the nature of the evaluation its results can be extrapolated to those potential discharge locations. As described in Section 5.1.1.4 of the SEIS:

“In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient

from the RMEI location, it would be less likely that groundwater wells would capture all of the released radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS."

For the same reason, if the entire plume turned to the west in the Amargosa Desert and discharged in the Death Valley springs, estimated impacts would be no greater than those described in the SEIS for the RMEI would.

1.7.4 (2850)

Comment - RRR000675 / 0007

The DOE has stated in the Draft Repository SEIS that groundwater pumping will be limited for the project. It also states that the impact it will have on groundwater resources will be much less than the amount current users have. It is very difficult for the Tribe to comment on this and any other DOE document when the DOE continually changes its commitments to fit [its] agenda. On June 1, 2007 the State of Nevada issued a cease-and-desist order against the DOE for using State of Nevada water for an unauthorized purpose. The State of Nevada never granted the DOE permission to use Nevada water for drilling bore holes to gather scientific data. Under a court-approved agreement, the DOE was only supposed to use the state's water for flushing toilets, fire suppression and dust control. The Draft Repository SEIS has similar language to the agreement between the DOE and State of Nevada. How can the Tribe trust the DOE to abide by its plans in the future when it can not abide by its current plans?

Response

DOE acknowledges its ongoing disputes with the State of Nevada on the appropriation and use of groundwater at Yucca Mountain. Section 4.1.3.2 of the Repository SEIS discusses the amount of water DOE has proposed for use and the reasons that amount would be small in comparison to current use in Amargosa Valley.

1.7.4 (2894)

Comment - RRR000688 / 0028

The commenter stated that water is going to be a big problem.

Response

As discussed in Section 4.1.3.2 of the Repository SEIS, existing water resources are adequate to support the proposed actions at Yucca Mountain without significant impacts to water users in the downgradient area. As with all major construction projects, the building and operation of the repository would require an adequate supply of water for construction materials such as concrete, for control of dust, and for emergency use such as fire suppression. DOE submitted its application for the needed water to the State of Nevada in 1997. The state denied this request on the basis of state law in 2000 and the matter is the subject of litigation pending in the Federal District Court in Nevada. DOE will continue to pursue the litigation, which is currently stayed by the District Court, and to work with the state to obtain the water necessary to support the repository program.

1.7.4 (3608)

Comment - RRR000142 / 0008

The EISs leave many concerns unaddressed. Changes to the hydrology because of global warming.

Response

DOE has studied geologic and other natural records that indicate climate changes that occurred in the distant past in the area of Yucca Mountain. The Department used this information to develop estimates of climate changes that could occur in the distant future. Because the evaluation of repository long-term postclosure performance included modeling of natural events up to 1 million years into the future, it was important to include estimates of climate changes. This included the accompanying changes in the amount of water that would percolate down through the mountain and changes in groundwater hydrology due to more water in the area. As described in Section 5.3.4.1 of the Repository SEIS, the analysis of long-term postclosure performance of the repository assumed the current climate is the driest it will ever be at Yucca Mountain. This is reasonable based on the climate record, and it is conservative because the presence of additional water would present a harsher environment in relation to the rate at which waste packages would degrade over the thousands of years represented in the models.

1.7.4 (3708)

Comment - RRR000082 / 0001

The commenter stated the Draft Repository EIS does not include California in the groundwater region of influence and that the Draft SEIS contains no meaningful assessment of potential impacts to the lower carbonate aquifer, makes no predictions based on water infiltration rates and waste package corrosion rates, makes no predictions of groundwater migration times, the severity or timeframe for impacts to the lower carbonate aquifer, or discharge point into Death Valley National Park. Therefore, the draft SEIS does not assess impacts for plant life, wildlife, wildlife habitat, or drinking water supplies in Death Valley National Park that radionuclides migrating from the repository could affect.

The commenter also stated that the Draft Repository SEIS does not assess or validate Inyo County's groundwater studies program and does not incorporate any of the county's fuel chemical analysis, which strongly suggests the connection between water underneath the repository and seeps into springs in Death Valley National Park.

The commenter further stated that there is an upper gradient in the lower carbonate aquifer that causes lower carbonate aquifer water to move upward into the volcanic aquifers because of a steep downgradient in the vicinity of Yucca Mountain. While Inyo County supports the DOE argument that this upper gradient would prevent migration of radionuclides from the repository to the carbonate aquifer, the upper gradient is in a very fragile hydrologic condition and regional groundwater pumping from the carbonate and volcanic aquifers could degrade it.

The commenter also stated that Inyo County strongly disagrees with the DOE assertion that future effects of groundwater pumping are highly speculative and need not be considered in a *National Environmental Policy Act* analysis. To produce a complete and adequate Final Repository SEIS, DOE should consider present pumping rates and their impact on the upper gradient and radionuclide migration from the repository.

Response

The Repository SEIS describes the best available information about flow paths in the saturated zone. The conceptual model of groundwater flow described in Section 3.1.4.2.1 of the SEIS shows the plume from Yucca Mountain would move first into the volcanic aquifers, then south into the alluvial aquifer, Amargosa Desert, and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. Sections 3.1.4.2.1 and 5.4 of the SEIS also recognize that groundwater flowing through the Amargosa Desert might contribute to the Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater starting in the volcanic aquifer beneath Yucca Mountain. Because of the strong link between the Death Valley springs and water from the lower carbonate aquifer, water starting in the volcanic aquifers does not appear to be the primary source for the springs. DOE has revised the text to be clearer.

In relation to impacts to Death Valley National Park, Chapter 5 of the Repository SEIS specifically describes potential impacts to the RMEI and, in relation to potential impacts at other locations states (in Section 5.1.1.4 of the SEIS):

"In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient from the RMEI location, it would be less likely that groundwater wells would capture all of the released radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS."

For the same reason, if the entire plume turned to the west in the Amargosa Desert and discharged in the Death Valley springs, impacts would be no greater than those described in the SEIS for the RMEI would.

DOE has added text to Section 3.1.4.2.1 of the Repository SEIS to describe the Inyo County efforts better and to reference related documents that became final since the publication of the Draft SEIS. In addition, DOE has revised Figure 3-9 to show California hydrographic areas.

The site-scale groundwater flow model that DOE developed and used to estimate impacts from the Proposed Action described in the Repository SEIS incorporates boundary conditions from the regional flow model, which is based on current recharge and discharge (including pumping) estimates. Specifically, the model includes effects from the current level of pumping in the Amargosa Desert area by considering the lower groundwater elevations along its southern boundary that are caused by pumping (DIRS 177391-SNL 2007, p. 6-5). Further, the calibration of the model included adjustments to minimize the difference between observed and simulated water levels at many target locations along probable flow pathways (DIRS 177391-SNL 2007, p. 6-58), including areas already affected by lowered groundwater levels. The current level of pumping in the Amargosa Desert, though significant, does not appear to have adversely affected the upward gradient in the lower carbonate aquifer; current investigations (including those by Inyo County) have shown the upward gradient to be present under current conditions.

All the factors that DOE considered and evaluated in the TSPA modeling effort basically bound a scenario in which the upward gradient in the lower carbonate aquifer is reduced or eliminated. As part of the efforts to develop the TSPA model, DOE evaluated (DIRS 174190-BSC 2005, all) a wide range of features, events, and processes that could affect flow and transport in the saturated zone. The evaluation screened features, events, and processes for whether the model needed to include them. For example, one of the features, events, and processes was a significant [up to about 300-meter (1,000-foot)] decline in the water table (DIRS 174190-BSC 2005, pp. 6-32 to 6-34). DOE concluded that groundwater might have been this much lower during the past 11.6 million years based on investigations of geologic, fossil, and mineralogical records. The evaluation of this lower water table concluded that the greater distance of travel in the unsaturated zone, the lower permeability of the volcanic aquifer at lower depths, and the likely lower hydraulic gradient would all act to slow contaminant travel times under such a scenario. As a result, it concluded that the analysis did not have to carry this scenario into the evaluation of repository postclosure performance because it would not have an adverse impact on performance (that is, impacts would be smaller than those for the nominal case).

DOE also evaluated the TSPA flow model through a wide range of parameter uncertainties to determine impacts in model results if parameter values changed. For example, one of the parameters run at different values was the relationship between horizontal and vertical permeability in the saturated zone, which was generally accepted to be in the range of 10 to 1 (that is, permeability in the horizontal direction is 10 times that in the vertical direction, causing water to move preferentially in the downgradient horizontal direction). In addition, DOE ran the model at a permeability ratio of 1 to 1, which is referred to as the removal of vertical anisotropy (DIRS 177391-SNL 2007, pp. 6-78 and 6-79). In this case, the modeled particles traveled deeper into the saturated zone, as would be expected, but the amount of material passing through specific boundaries did not change significantly from the base case. (The analysis noted that the 10-to-1 ratio base case model provided more accurate results in comparison with calibration points.)

Both of the example conditions involve scenarios in which contaminants would reach deeper in the saturated zone beneath Yucca Mountain than the nominal case scenario and neither resulted in greater impacts.

1.7.4 (3749)

Comment - RRR000642 / 0021

DOE has failed to analyze adequately the potential ground water and other environmental impacts in California.

In 2000, thirteen California agencies, in a comprehensive review of the Draft EIS for the repository, found serious deficiencies in DOE's evaluation of groundwater and transportation impacts in California. California agencies identified potential groundwater impacts in the Death Valley region, impacts on wildlife, habitat and public parks, as well as transportation impacts in California from the repository. DOE is fully obligated under NEPA to provide a complete evaluation and disclosure of these impacts and provide adequate notice to the communities potentially affected by the proposed project.

Groundwater flowing beneath Yucca Mountain discharges in springs to the south, including Furnace Creek Springs in Death Valley, California. This is a potential pathway for radioactive contaminants that may leak from the waste packages in the repository to reach these springs in Death Valley. The DSEIS should better characterize regional hydrogeology in the Amargosa and Death Valley areas to evaluate groundwater flow and evaluate the potential impact from radionuclide contaminant migration toward aquifers in California. Further, the Draft SEIS should propose mitigation measures, for example, a

monitoring program to detect potential radionuclide migration from the repository into California aquifers.

The DSEIS summarizes Inyo County's groundwater studies program and that a primary focus of the County "has been the investigation of the source of water that discharges from the various springs on the east side of Death Valley and whether there is a hydraulic connection between those springs and the groundwater moving beneath Yucca Mountain." The County has concluded that they have strong scientific evidence through geochemical analysis that the Lower Carbonate Aquifer (LCA), which underlies the repository, has several discharge points on the western side of the Funeral Mountains in the Furnace Creek area of Death Valley National Park. The DSEIS and Inyo County's research suggest that groundwater discharged in the Death Valley National Park is mixed with other groundwater sources from the Ash Meadows area and the Amargosa Desert.

DOE assumes that because the volcanic aquifers do not discharge into the Death Valley National Park, that no impacts to the Park are anticipated. Inyo County disagrees and believes that the Park will be potentially affected by contaminated discharge from the LCA, and not the volcanic aquifers. DOE concedes that Inyo County, but not the Park, will be impacted from contaminants in the volcanic aquifers. Radionuclides in the volcanic aquifers will surface at Franklin Lake Playa and Alkali Flat, near Death Valley Junction, California. However, the DOE predicts this will happen after any applicable compliance period.

Inyo County observed that "the most glaring omission in the DSEIS is that it contains no meaningful assessment of potential impacts to the LCA." The DSEIS makes no predictions, based upon water infiltration and waste package corrosion rates, or groundwater migration times, of the severity or timeframe for impacts to the LCA, or its discharges points in the Park. Accordingly, the DSEIS contain[s] no impact assessment for plant life, wildlife, wildlife habitat or drinking water supplies in the Park that could potentially be impacted by migrating radionuclides from the repository.

Although the 2002 Final Environmental Impact Statement for a Geologic Repository at Yucca Mountain, Nevada (2002 FEIS) frequently references ongoing groundwater impact studies, the Draft Repository SEIS contains little new information on studies conducted by the DOE, the State of Nevada, or Nye and Inyo counties. DOE notes that Death Valley proper is the regional hydrological sink for surface and groundwater. However, the Yucca Mountain regional hydrographic map on page 3-33 (Figure 3.9) in the "Affected Environment" section fails to include California in terms of hydrographic areas, even though maps on pages 3-28 (figure 3-7) and 3-30 (Figure 3-8) clearly show California and Death Valley as part of the Death Valley regional groundwater flow system, receiving flow from both the volcanic aquifers and the LCA.

We believe that Inyo County has a legitimate objective to ensure protection for current and future water supplies and its living environment. Issues they have raised concerning potential groundwater impacts in Inyo County should be evaluated, for example, does groundwater pumping in the region for repository construction, operation and closure affect potential groundwater migration from the repository site? Additional information is needed on the impacts of groundwater pumping as well as the potential aquifer contamination and the migration of contaminated groundwater from the Yucca site to eastern Death Valley. In addition, monitoring wells (and high capacity extraction wells) should be strategically located around the repository to detect any early "leaks" into any of the groundwater aquifers. A series of monitoring wells (with high capacity extraction capabilities) should be placed into the aquifers along the California border to track and extract any contamination plumes should radionuclide migration and groundwater contamination occur.

Inyo County has concluded that an upper gradient exists in the LCA, which causes LCA water to move upward into the volcanic aquifers because of a steep down gradient found in the vicinity of Yucca Mountain. They note that the upper gradient is considered to be ephemeral and very fragile and that the upper gradient could be degraded by regional groundwater pumping, both from the LCA and volcanic aquifers. DOE maintains that the 20 future effects of groundwater pumping are highly speculative, and need not be considered in any NEPA analysis. Therefore, they do not propose any analysis of the impacts from groundwater pumping in the region, nor any regulatory measures to maintain the upper gradient. Inyo County strongly disagrees with this assertion and recommends that DOE should consider present pumping rates and its impact on the upper gradient and radionuclide migration. We agree with Inyo County's conclusion that any NEPA analysis of repository performance and radionuclide migration that does not take into account the effects of groundwater pumping is incomplete and completely inadequate. Therefore, we recommend that DOE evaluate the effects of groundwater pumping on repository performance and potential radionuclide migration.

Groundwater is proposed to be used for repository construction and operations. DOE would pump groundwater from wells in the Jackass Flats hydrographic area in Nevada. Groundwater from that area flows into Amargosa Desert aquifers. The Draft SEIS notes that because these aquifers are used for the regional water demand, the potential effects of DOE groundwater use on this down gradient use is of particular concern (Draft SEIS, p. S-24).

Response

DOE has made appropriate notifications to communities that the Proposed Action could affect. The Department made initial notifications on its intent to prepare a supplemental EIS and for public scoping meetings, as described in Section 1.5.2 of the Repository SEIS. It also made notifications on the availability of the Draft Repository SEIS and on the schedule for public meetings, as described in Section 1.5.3 of the SEIS.

The general conceptual model of the regional groundwater flow system described in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. However, Sections 3.1.4.2.1 and 5.4 of the Repository SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater starting in the volcanic aquifers beneath Yucca Mountain. As described in Section 9.2.2 of the SEIS, DOE would conduct preclosure monitoring at the repository to track the status and ensure adequate performance. After sealing the repository, DOE would conduct postclosure monitoring to continue to ensure acceptable performance. An amendment to the NRC license would define the details of the postclosure program because it would not start until about 100 years after the start of operations. Deferring the details of this program to the closure analytical period would allow identification of technologies that might not be currently available.

The Repository SEIS describes the best available information about flow paths in the saturated zone. Section 3.1.4.2.1 of the SEIS indicates the volcanic aquifers might contribute to spring discharges in Death Valley, but (because of the strong link between those discharges with water from the lower carbonate aquifer) the volcanic aquifers do not appear to be the primary source for the springs. DOE has revised the SEIS text for clarity.

Chapter 5 of the SEIS specifically describes potential impacts to the RMEI and, in relation to potential impacts at other locations, states (in Section 5.1.1.4):

"In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient from the RMEI location, it would be less likely that groundwater wells would capture all of the released radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS."

For the same reason, if the entire plume turned to the west in the Amargosa Desert and discharged in the Death Valley springs, impacts would be no greater than those described in the SEIS for the RMEI would.

The site-scale groundwater flow model that DOE developed and used to estimate impacts from the Proposed Action described in the SEIS incorporates its boundary conditions from the regional flow model, which is based on current recharge and discharge (including pumping) estimates. Specifically, the site-scale model includes effects from the current level of pumping in the Amargosa Desert area by considering the lower groundwater elevations along its southern boundary that are caused by pumping in the Amargosa Desert (DIRS 177391-SNL 2007, p. 6-5). The calibration of the model included adjustments to minimize the difference between observed and simulated water levels at target locations along probable flow pathways (DIRS 177391-SNL 2007, p. 6-58), including areas already affected by lowered groundwater levels from pumping. The current level of pumping in the Amargosa Desert, though significant, has not adversely affected the upward gradient in the lower carbonate aquifer; investigations (including those by Inyo County) have shown the upward gradient to be present under current conditions.

All the factors that DOE considered and evaluated in the TSPA modeling effort basically bound a scenario in which the upward gradient in the lower carbonate aquifer is reduced or eliminated. As part of the efforts to develop the TSPA model, DOE evaluated (DIRS 174190-BSC 2005, all) a wide range of features, events, and processes that could affect flow and transport in the saturated zone. The evaluation screened features, events, and processes for whether the model needed to include them. For example, one of the features, events, and processes was a significant [up to about 300-meter (1,000-foot)] decline in the water table (DIRS 174190-BSC 2005, pp. 6-32 to 6-34). DOE concluded that groundwater might have been this much lower during the past 11.6 million years based on investigations of geologic, fossil, and mineralogical records. The evaluation of this lower water table concluded that the greater distance of travel in the unsaturated zone, the lower permeability of the volcanic aquifer at lower depths, and the likely lower hydraulic gradient would all act to slow contaminant travel times under such a scenario. As a result, it concluded that the analysis did not have to carry this scenario into the evaluation of repository postclosure performance because it would not have an adverse impact on performance (that is, impacts would be smaller than those for the nominal case).

DOE also evaluated the TSPA flow model through a wide range of parameter uncertainties to determine impacts in model results if parameter values changed. For example, one of the parameters run at different values was the relationship between horizontal and vertical permeability in the saturated zone, which was

generally accepted to be in the range of 10 to 1 (that is, permeability in the horizontal direction is 10 times that in the vertical direction, causing water to move preferentially in the downgradient horizontal direction). In addition, DOE ran the model at a permeability ratio of 1 to 1, which is referred to as the removal of vertical anisotropy (DIRS 177391-SNL 2007, pp. 6-78 and 6-79). In this case, the modeled particles traveled deeper into the saturated zone, as would be expected, but the amount of material passing through specific boundaries did not change significantly from the base case. (The analysis noted that the 10-to-1 ratio base case model provided more accurate results in comparison with calibration points.)

Both of the example conditions involve scenarios in which contaminants would reach deeper in the saturated zone beneath Yucca Mountain than the nominal case scenario and neither resulted in greater impacts.

1.7.4 (3756)

Comment - RRR000929 / 0009

The commenter described a legal issue between DOE and the State of Nevada about water use that occurred after the completion of the Yucca Mountain FEIS. The commenter then stated that the Yucca Mountain site is not suitable for use as a repository. As evidence, the commenter cites three points: (1) DOE knew rainwater percolates relatively fast at the site, threatening the waste, and changed its own Site Suitability Guidelines just before it submitted a Site Recommendation in 2002, knowing that Yucca Mountain could not meet those guidelines, (2) DOE's inability to proceed quickly with a license application soon after the Site Recommendation, demonstrated by more than 5 years of delay and DOE continuing to conduct studies of the site and (3) DOE has deliberately falsified hydrogeologic data to claim that water sources under Yucca Mountain would not be contaminated. The commenter suggested DOE has inadequately considered the complexity of the groundwater basins (especially the lower carbonate aquifer) and failed to address health impacts to vulnerable individuals and populations (specifically citing the Timbisha Shoshone Tribe in Death Valley, pregnant women, fetuses, infants, children, the elderly, and those with suppressed immune systems) and traditional lifestyles of farmers and others that will consume foodstuffs grown nearby.

Response

The legal dispute associated with DOE's use of groundwater since the completion of the Yucca Mountain FEIS is not in the scope of the Repository SEIS. Neither is item (2) identified in the summary comment. DOE does not address these items further in the Repository SEIS.

In relation to item (1), as noted in the Comment-Response Document for the Yucca Mountain FEIS (p. CR-6), DOE did not 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 EPA (40 CFR Part 197) and the NRC (10 CFR Part 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. A key element in this case is the commenter's concern that rainwater percolates relatively quickly through the proposed repository and risks fast corrosion of the waste containers DOE would emplace. DOE has described its findings and evaluations of water movement in the unsaturated zone at Yucca Mountain in this Repository SEIS and the Yucca Mountain FEIS. Section 3.1.4.2.2 of the SEIS contains the latest information on water movement in the unsaturated zone, including revised estimates of infiltration rates and the description of an unusual observation of a seepage event in a tunnel at Yucca Mountain as a result of an extremely high precipitation event. This

event occurred in an area of the mountain that would be outside the emplacement drifts and below overlying strata that DOE anticipated to provide relatively quick travel routes. The Department incorporated this new information in the models that estimate the long-term postclosure performance of the repository summarized in Chapter 5 and Appendix F of the SEIS. The repository would operate within required parameters with acceptable exposure levels to a groundwater user at the reasonably maximally exposed individual location.

DOE assumed that item (3) in the comment deals with the controversy related to information found in e-mails of certain employees performing Yucca Mountain-related work between 1998 and 2004. Information in the e-mails suggested or hinted that projected data might have been falsified. DOE issued results from its evaluation of this incident in March 2007 (DIRS 180680-DOE 2007, all). The personnel involved were working on computer modeling of water infiltration at Yucca Mountain. The investigation found no evidence that information associated with the work was falsified or modified as suggested in the e-mails, but it did find that certain elements of the infiltration model products involved did not meet DOE traceability and transparency requirements. As a result, Sandia National Laboratories, which was not involved in the effort at the time of the controversy, provided verification and replacement, as appropriate, of the earlier infiltration modeling. Chapters 3 and 5 of the Repository SEIS now cite the Sandia results.

The comment indicates DOE did not inadequately consider the complexity of the groundwater basins, particularly the lower carbonate aquifer. Section 3.1.4.2.1 of the SEIS notes that although the regional groundwater system is very complex, the SEIS is able to present only summaries of key elements from the broad expanse of documentation developed for the Yucca Mountain Project. Readers can find more detailed information in the cited references.

DOE has inferred that the comment specifically mentions the lower carbonate aquifer because of concerns similar to those posed by Inyo County, California. The Department has supported efforts by Inyo County to investigate the lower carbonate aquifer and specifically to look at connections between the carbonate aquifer and spring discharges in the Furnace Creek area of Death Valley. The Inyo County premise is that the upward hydraulic gradient in the carbonate aquifer is very important to the flow path by which radionuclides would eventually migrate from Yucca Mountain. Without the upward gradient, the premise continues that radionuclides migrating down from the Yucca Mountain Repository could travel as far as the deep carbonate aquifer and pose a different, potentially more problematic, migration scenario than the one DOE evaluated, specifically that contaminants from Yucca Mountain would have a fast pathway to springs in Death Valley. Although DOE modeling of groundwater flow and contaminant migration does not include specific scenario that involve the elimination of the upward gradient in the carbonate aquifer, the modeling performed to evaluate the long-term postclosure performance of the repository adequately bounds the scenario established by the Inyo County efforts.

The general conceptual model of the regional groundwater flow system described in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. Sections 3.1.4.2.1 and 5.4 of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater from beneath Yucca Mountain. In other words, the results of groundwater investigations show the potential for radionuclides migrating from the repository to reach Death Valley springs whether the upward gradient in the lower carbonate aquifer is maintained or not. DOE has added text to Section

3.1.4.2.1 of the SEIS to summarize the Inyo County studies; however, a description of the lower carbonate aquifer system in more detail is beyond the scope of the SEIS.

Finally, the comment suggests that DOE has inadequately addressed health impacts and traditional lifestyles of area residents. The long-term, postclosure evaluation described in the Repository SEIS (see Chapter 5 and Appendix F) analyzes the effects of groundwater contamination from Yucca Mountain on a hypothetical person designated as the reasonably maximally exposed individual (RMEI). The characteristics of the RMEI are established by regulations (see 10 CFR Part 63 and 40 CFR Part 197) and include the fact that the individual is located (lives) about 18 kilometers (11 miles) downgradient from the repository, over the highest concentration of radionuclides in the contamination plume, is an adult, consumes 2 liters (0.5 gallon) of groundwater each day, and (per 10 CFR 63.312 and 40 CFR 197.21) must have a diet and lifestyle representative of the people currently living in the town of Amargosa Valley. In the preamble to the final rules issued in 2001, both the EPA and the NRC addressed many comments about the RMEI they received during the public comment periods during the respective rulemakings, including several that were very similar to those raised here about impacts to groups potentially more vulnerable than a generic adult. Both the EPA and the NRC explained that the objective was to establish a single exposure scenario for the RMEI that was protective of children and other groups [see 66 FR 32074, 32092, June 13, 2001 (EPA) and 66 FR 55732, 55753-54, November 2, 2001 (NRC)].

Chapter 5 of the SEIS specifically describes potential impacts to the RMEI and, in relation to potential impacts at other locations, states (in Section 5.1.1.4):

"In the Yucca Mountain FEIS the results for the RMEI [reasonably maximally exposed individual], who would be located at 18 kilometers (11 miles) were scaled to two other distances: 30 kilometers (19 miles) and 60 kilometers (37 miles). ... New modeling since the FEIS indicates a considerably smaller plume width. Upon review of basis for dose calculations DOE confirmed that if the plume were diluted into the 3.7 million cubic meters (3,000 acre-feet) of water use at the RMEI location, this large water use would likewise consume the entire plume at all other locations beyond the specified RMEI location of 18 kilometers (11 miles). This is because the spreading of the plume would be insufficient for any of the radionuclides to escape capture in the water-use volume; however, as the plume moved downgradient from the RMEI location, it would be less likely that groundwater wells would capture all of the released radionuclides. Furthermore, the time-delay from further transport in the alluvium would result in insignificant amounts of decay. Therefore, the estimated doses at downgradient locations would be no greater than those of the RMEI. Thus, doses at distances other than the RMEI location were not calculated for this Repository SEIS."

For the same reason, were the entire plume to turn to the west in the Amargosa Desert, for example, and discharge via the Death Valley springs, impacts would be no greater than those described in the SEIS for the RMEI would.

1.7.4 (3959)

Comment - RRR000671 / 0002

The CGTO knows that the DOE did not consider the impacts for Indian lands including the flooding that occurred in Death Valley.

Response

The Proposed Action would not have significant impacts on flooding in the area. DOE would ensure that the design of surface facilities at the site protected them from flooding and incorporated stormwater runoff control measures to ensure that stormwater leaving the area did not cause downgradient damage.

1.7.4 (4050)

Comment - RRR000092 / 0002

The commenter presented a map showing the Amargosa River watershed and Yucca Mountain flow near its apex. The commenter stated, "I hope that this helps you get the river back on your own maps as well."

Response

As discussed in Section 3.1.4.1.1 of the Repository SEIS, DOE has consistently identified the Amargosa River as a significant drainage feature of the region outside the immediate area of Yucca Mountain.

1.7.4 (4059)

Comment - RRR000549 / 0003

Rain in the area appears to result in flash floods that travel rapidly, causing any escaping radionuclides to travel down river channels. A high-level nuclear waste repository is required to isolate the waste for hundreds of thousands of years and based on rapidly changing climate conditions, this site would be unable to do so. Also, the base of the mountain is home to the state's largest dairy providing milk to as far away as Los Angeles, and the valley in which the mountain lies shares the aquifer with the mountain.

Response

There is very low potential for radiological releases to occur during the repository construction, operations, monitoring, and closure analytical periods and even lower potential for releases that could affect water resources. As described in Section 4.1.3.1 of the SEIS, surface facilities where radiological materials would be managed would be protected against flooding by the installation of engineered barriers such as dikes and drainage channels. Use of retention ponds for the capture of storm water runoff in these areas would also insure no contamination escaped the area. There should be no significant concern for flash flooding to carry radionuclides down river channels during this period. DOE has performed extensive studies to develop estimates of the erosion rate that has affected Yucca Mountain over its geologic history and has concluded that natural erosion would not breach the repository emplacement area, so there would not be radionuclide contamination of surface water by that scenario. However, as described in Chapter 5 of the Repository SEIS, DOE anticipates a gradual slow release of radionuclides from the repository as the waste packages degraded over thousands of years, and these radionuclides would eventually reach the groundwater beneath Yucca Mountain.

The general conceptual model of the regional groundwater flow system in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into the Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa and possibly contribute to Death Valley springs to the west. DOE has studied, evaluated, and modeled the mechanisms and natural features that would be involved in the migration of radionuclides away from Yucca Mountain and estimates that even the reasonably maximally exposed individual (RMEI) using and consuming the groundwater would not be subjected to radiological impacts above regulatory limits. NRC and EPA regulations (10 CFR 63.312 and 40 CFR 197.21) require the RMEI location to be in an accessible area, close to the boundary of the land withdrawal area, where the concentration of radionuclides migrating in

the groundwater from Yucca Mountain would be the highest. Locations farther away from the withdrawal area, such as the dairy operations, could experience exposure levels similar to that of the RMEI but they would not be higher.

1.7.4 (4061)

Comment - RRR000572 / 0002

The commenter stated that DOE should be concerned about the population growth and density in Pahrump, Las Vegas, and surrounding areas, and that those populations depend on groundwater for such purposes as irrigation and drinking-water supplies.

Response

DOE recognizes that in the arid environment of southern Nevada, water is of crucial importance and is limited. As described in Section 4.1.3.2 of the Repository SEIS, existing water resources are adequate to support the actions at Yucca Mountain without significant impact to other water users in the downgradient area. As described in Chapter 5 of the SEIS, there could be a gradual slow release of radionuclides from the repository as waste packages degraded over thousands of years; these radionuclides would eventually reach the groundwater beneath Yucca Mountain. DOE has studied, evaluated, and modeled the mechanisms and natural features that would be involved in the migration of radionuclides away from Yucca Mountain and estimates that even the reasonably maximally exposed individual who used and consumed the groundwater would not be subjected to radiological impacts above regulatory limits.

1.7.4 (4062)

Comment - RRR000572 / 0004

The commenter stated that "the water and hydrogeologic basin in this region is known to be highly corrosive," which would bring about major implications for security and storage.

Response

DOE recognizes that water in the area picks up properties associated with the rock and soil through which it moves. The evaluation of the long-term postclosure performance of the repository incorporated measured water characteristics in its estimates of corrosion rates and waste package degradation. It also incorporated the chemical characteristics of the groundwater in the estimates of how radionuclides would move through the unsaturated zone and the aquifers.

1.7.4 (4064)

Comment - RRR000737 / 0016

There is a case made in the DSEIS that, "contamination from Yucca Mountain is not likely to mix with carbonate aquifer waters and discharge to the surface at Ash Meadows or Devils Hole (DIRS 104983-CRWMS M&O 1999, all) under current conditions." (DOE/EIS-0250F-S1D, pg 5-22). "Not likely" is not quantitative enough to describe the potential for contamination. However, in the next paragraph the DOE states that there will be "no contamination" of this resource. How does "not likely" translate into "no" contamination. This particular area is very important and part of the Death Valley National Monument, thus requiring very specific details on the expected level of contamination for public review.

Response

DOE agrees with this comment, and has modified the text in the Repository SEIS so the descriptions are consistent in both paragraphs. Specifically, the first cited paragraph has been changed to state that, under current conditions, contamination from Yucca Mountain would not mix with carbonate aquifer waters and discharge to the surface in the Ash Meadows area.

1.7.5 Biological Resources and Soils

1.7.5 (157)

Comment - 2 comments summarized

Biological Resources - American Indian View of Impacts

Two commenters stated that the Draft Repository SEIS does not address biological resources in a way that is culturally appropriate to the unique American Indian view of the land and the biological resources it provides. This view includes the concept that indigenous peoples are "one" with the land and manage its resources with future generations in mind. The commenters wish to see DOE assess traditional cultural ecosystem considerations based on indigenous peoples' perspectives and concerns, and want to see a quantitative description of potential impacts to biological resources.

Response

In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the FEIS, DOE committed to continue the Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. The FEIS reported that construction activities would have no direct impacts on several delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. However, because of the general level of importance that American Indians attribute to these places, which they believe are parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. Based on tribal update meetings for members of the Consolidated Group of Tribes and Organizations held since the completion of the FEIS, the American Indian viewpoint is unchanged (see Section 4.1.5.1.2 of the Repository SEIS).

Although potential impacts to biological resources and soils from the Proposed Action cannot be quantified except for the amount of land disturbance, such impacts would be small and would not affect regional biodiversity or plant and animal populations. Sections 4.1.4 and 5.10 of the Repository SEIS explain the rationale for this conclusion from a biological resources perspective for preclosure and postclosure impacts, respectively.

1.7.5 (1576)

Comment - RRR000690 / 0041

Potential damage to animal habitat from Yucca Repository project and rail construction activities.

Response

Section 3.1.5.1 of the Repository SEIS describes the flora and fauna of the affected environment at Yucca Mountain. Section 4.1.4.1 of the SEIS analyzes impacts that repository construction, operations, monitoring, and closure could have on resident species. The primary impacts on desert plants and animals would be the disturbance of up to about 2,200 acres of land and the continuation of human presence and activities, including traffic. DOE based its analysis of these impacts on a large amount of research and information about the desert environment at Yucca Mountain. Table 2-3 of the SEIS summarizes potential impacts from rail construction activities and Table 2-6 summarizes combined repository and rail impacts. Sections 4.2.7 and 4.3.7 of the Rail Alignment EIS describe potential impacts from rail construction activities.

1.7.5 (2331)

Comment - RRR001078 / 0001

Although the SElS does not depict transportation routes other than existing rail lines or interstate highways through the Mojave Desert and Great Basin regions of California, the Department would like to keep informed about any future transportation system improvements necessary to accommodate the project. Specifically, highway improvements or rail line improvements may have the potential to adversely impact sensitive biological resources, including species listed under the *California Endangered Species Act* (CESA). These species include desert tortoise (Gopherus agassizii - listed as threatened) and Mohave ground squirrel (Spermophilus mohavensis -listed as threatened). Any plans to provide for improved transportation infrastructure should be coordinated with the Department, and should be the focus of additional NEPA and CESA review, as appropriate.

Response

In its analysis of the Proposed Action and alternatives for the rail alignment, DOE evaluated impacts to threatened and endangered species in the regions of influence. This included consultation with the U.S. Fish and Wildlife Service under Section 7 of the *Endangered Species Act* and informal consultation with State of Nevada agencies. DOE does not propose any upgrades to highways or rail lines outside the State of Nevada.

1.7.5 (3191)

Comment - RRR000121 / 0016

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Failure to conduct tribal and ecological health risk assessment.

Response

DOE is committed to the implementation of sound stewardship practices that protect air, water, land, and cultural and ecological resources. Chapter 9 of the Repository SEIS discusses measures DOE would implement to mitigate adverse impacts to the environment that could occur if the Department implemented the Proposed Action. DOE understands that American Indians consider the Yucca Mountain area, as well as all environmental resource areas, to be culturally significant to their religious and holistic beliefs. DOE is not targeting tribal sacred lands for repository development. The Repository SEIS considers extensive cultural resources analyses, impact identification, and appropriate mitigations. In addition, the SEIS presents American Indian perspectives as expressed in the American Indian Writers

Subgroup document, American Indian Perspectives on the Yucca Mountain Site Characterization Project and the Repository Environmental Impact Statement (DIRS 102043-AIWS 1998), prepared by tribal representatives to present their concerns. The SEIS references that document in applicable resource sections.

1.7.5 (3414)

Comment - RRR001081 / 0002

We would like to see a noxious weed plan prepared to deal with the weeds at the repository. It would seem more logical to ask for a weed plan in the Rail EIS. The staging area around the portal might be impacted by noxious weeds. The staging area will receive trains from around the US and any weeds brought in on transport vehicles are a mechanism for noxious weed transport.

Response

DOE has added text to Section 4.1.4.1.1 of the Repository SEIS to state that it would develop and implement methods to control invasive and noxious weeds on disturbed sites during construction and operations of the repository, and has added a bullet to this effect in Table 9-1 of the SEIS.

1.7.5 (4079)

Comment - RRR000995 / 0018

The commenter asked if additional field studies would be necessary before construction to identify specific locations of biological crust.

Response

As noted in Section 4.1.4.1.1 of the Repository SEIS, further attempts to locate or map occurrences of biological soil crusts could result in additional disturbance or destruction of these crusts beyond those the Proposed Action could cause. Therefore, DOE plans no additional field studies.

1.7.6 Cultural Resources

1.7.6 (4178)

Comment - 26 comments summarized

Yucca Mountain is Sacred to Western Shoshone

Yucca Mountain is a sacred site to the Shoshone and other American Indian tribes. Therefore, constructing a repository at Yucca Mountain would cause impacts to the culture of those American Indians.

Response

In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the FEIS, DOE committed to continue the Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. The FEIS reported that construction activities would have no direct impacts on several delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. However, because of the general level of importance that American Indians attribute to these places, which they believe are

parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. Based on annual tribal update meetings with the Consolidated Group of Tribes and Organizations held since the completion of the FEIS, the American Indian viewpoint is unchanged. Nevertheless, DOE will continue to consult with tribal governments and to implement programs to minimize impacts to cultural resources.

1.7.6 (4179)

Comment - 4 comments summarized

American Indian Involved in Preconstruction Surveys

The text indicates that before beginning other land disturbances, DOE would conduct preconstruction surveys (Class III archaeological studies) to identify cultural sites in the affected areas. The Consolidated Group of Tribes and Organizations (CGTO) has recommended the inclusion of American Indian monitors in these activities.

Response

DOE will uphold its commitments on cultural and American Indian studies on the Yucca Mountain Project. The Department promotes a government-to-government interaction process and will continue to seek tribal input to cultural studies associated with the Project. DOE agrees with the Consolidated Group of Tribes and Organizations and will include American Indian monitors in cultural resource study efforts to the extent allowed by program funding levels.

1.7.6 (477)

Comment - RRR000396 / 0012

The U.S. Department of the Interior has recognized the Timbisha Shoshone Tribe as an "affected Indian tribe" under the *Nuclear Waste Policy Act*. Neither the draft SEIS nor the draft Rail EIS recognize the proximity of the tribe to the site and the likely impacts that will be felt throughout each phase of the Yucca Mountain Project by the Timbisha Shoshone. The final EISs should assess and analyze impacts to the tribe's drinking water supply, impacts from truck transport of nuclear materials through tribal lands, socio-economic impacts, impacts to cultural resources, and environmental justice issues.

Response

The Repository SEIS and the Rail Alignment EIS discuss the location of the Timbisha Shoshone Trust Lands and their proximity to the project, and DOE has conducted impact analyses for all land use and ownership scenarios. The EISs evaluate downgradient drinking water supplies as part of their hydrology impact studies. The SEIS and EIS address truck transport scenarios, socioeconomic studies, cultural resource evaluations, and environmental justice issues.

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the late 1980s. The program includes representatives from the Western Shoshone, Southern Paiute, Owens Valley Paiute and Shoshone, and Timbisha Shoshone Tribes. In addition, consultation between DOE and the tribes has occurred at tribal locations over the years. DOE has gained valuable input and perspectives through the interaction program, and presented these perspectives in the Repository SEIS.

1.7.6 (590)

Comment - RRR000032 / 0001

The commenter identified actions appropriate for a process that would protect archaeological resources from adverse impacts for managing actions associated with California-based projects. These include: (1) Contact the appropriate archaeological Information Center; (2) Require survey to determine whether previously unrecorded cultural resources are present; (3) Prepare a professional report detailing the findings and recommendations of the records search and field survey; (4) Consult with affected tribes; (5) Provide for the identification and evaluation of accidentally discovered archeological resources; (6) Use archaeological and tribal monitors during ground-disturbing activities; (7) Provide for the disposition of recovered artifacts and for the discovery of American Indian human remains or unmarked cemeteries, in consultation with culturally affiliated American Indians; and (8) Work with the American Indians who could be affected by the project.

Response

DOE is required by law and applicable regulations, including the National Historic Preservation Act, Archaeological Resources Protection Act, and a Programmatic Agreement with the Nevada State Historic Preservation Office to study, manage, and protect cultural resources at Yucca Mountain.

In addition, DOE has maintained a Native American Interaction Program with 16 tribes and 1 organization since the late 1980s. During preparation of the Yucca Mountain FEIS, DOE interacted with American Indian tribes on a range of topics 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), which it used as a reference in preparing the Yucca Mountain FEIS and this Repository SEIS.

In addition, DOE is engaged in ongoing consultation with the Nevada State Historic Preservation Office to ensure the appropriate consideration of cultural resources during the project; tribal participation will be part of that process. These consultation processes ensure that DOE analyzed and considered cultural impacts adequately in the Yucca Mountain FEIS and this Repository SEIS.

1.7.6 (1587)

Comment - RRR000690 / 0030

The commenter stated that the project has the potential for disturbance and possible destruction of Western Shoshone cultural resources.

Response

DOE has maintained a Native American Interaction Program with 16 tribes and 1 organization since the late 1980s. In addition, tribes appoint representatives to sit on a DOE-supported committee called the Consolidated Group of Tribes and Organizations, which includes representatives of Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone tribal governments with indigenous ties to Yucca Mountain and surrounding regions. The Group meets periodically to review, comment on, and recommend actions on aspects of the Yucca Mountain Project, including the Proposed Action and No-Action Alternative. It also reviews and comments on studies of cultural, historic, burial, and religious sites and on potential impacts to traditional resources and resource use. This process ensures that DOE

considers Native American concerns in the ongoing government-to-government relationship between the Department and the tribes.

In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the Yucca Mountain FEIS, DOE committed to continue the Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. The FEIS reported that construction activities would have no direct impacts on several delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. However, because of the overall level of importance that American Indians attribute to these places, which they believe are parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. Based on tribal update meetings with the Consolidated Group of Tribes and Organizations since the completion of the FEIS, the American Indian viewpoint is unchanged. DOE will continue to implement mitigation programs to minimize impacts to cultural resources.

1.7.6 (1605)

Comment - RRR000690 / 0020

It is recommended that a document, something akin to a cultural resource management plan, be developed to specifically address and monitor the assessment of YMP upon indigenous cultural resources. Such assessments should, again, includes indigenous representatives, and if possible, indigenous experts or experts familiar with and respected by indigenous communities and their cultural resources. The above approach would greatly assist in the identification, evaluation and monitoring of cultural resources and assist in promoting government-to-government relations. With these assessments completed, and in the event YMP is approved as an appropriate location for a spent nuclear fuel depository, the Tribe could recommend that specific cultural and or ceremonial areas be set aside as American Indian Cultural Resource Areas (AICRA).

Response

DOE's cultural resources study, management, and protection program addresses regulatory requirements of the Nevada State Historic Preservation Office. Representatives of the Consolidated Group of Tribes and Organizations reviewed the program; the Timbisha Shoshone Tribe is a member of that group. The cultural resources management program will continue to include tribal representatives in the study effort to provide tribal perspectives and recommendations.

1.7.6 (1606)

Comment - RRR000690 / 0019

The SEIS connotes impacts to cultural resources to be in the area of small to moderate and that the DOE would use best practices to mitigate potential cultural resource impacts. The proposed action and alternative of no-action lack the appropriate studies and or reports analyzing the complete impact upon cultural resources, sacred sites, and game and gathering areas within and near the YMP [Yucca Mountain Project] site. Therefore, at this time, in the absence of an appropriate assessment, the Tribe cannot support either YMP proposal. Additional studies should include an appropriate assessment, documentation and inventory of cultural sites and the cultural dynamic involved.

Response

DOE has maintained a Native American Interaction Program with 16 tribes and 1 organization since the late 1980s. Tribal representatives are appointed by their respective tribes to sit on a DOE-supported, committee called the Consolidated Group of Tribes and Organizations, which includes Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone tribal government representatives with indigenous ties to Yucca Mountain and surrounding regions. The Group meets periodically to review, comment on, and recommend actions that concern aspects of the project, including the Proposed Action and No-Action Alternative. It also reviews and comments on studies of cultural, historic, burial, and religious sites and of potential impacts to traditional resources and resource use. This process ensures that American Indian concerns are considered in the ongoing government-to-government relationship between DOE and the tribes.

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), which it used as a reference in preparing the FEIS and the Repository and Railroad SEIS. Other studies referenced in the Yucca Mountain FEIS include, but are not limited to: DIRS 103464-DOE 1989, all; DIRS 104959-DOE 1990, all; DIRS 103196-DOE 1990, all.

In addition, DOE is engaged in ongoing consultation with the Nevada State Historic Preservation Office to ensure that cultural resources are appropriately considered during the project. These consultation processes ensure that cultural resources and potential impacts, including those of the Proposed Action and No-Action Alternative, were adequately analyzed and considered in the Yucca Mountain FEIS and are adequately analyzed and considered in the Repository SEIS.

1.7.6 (1685)

Comment - RRR000836 / 0005

The Western Shoshone are concerned that there may be impacts to ongoing use of traditional areas for ceremonial, hunting and gathering purposes and visitation of cemeteries and burial sites, and to future access to areas in the event of rail accident, accidental release, or terrorist attack. Impacts in association with these resources and conditions need to be analyzed completely for the proposed actions for each alternative considered.

The Western Shoshone are concerned that there may be impacts to existing burial sites during construction of the rail line including potential removal of remains and funerary objects, and other desecration. The Western Shoshone belief is that remains should be left where they are found. Impacts need to be analyzed for the proposed actions for each alternative considered and mitigation plans discussed with the Western Shoshone traditional government.

Response

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the late 1980s. Tribal representatives are appointed by their respective tribes to sit on a DOE-supported committee called the Consolidated Group of Tribes and Organizations, which consists of Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone tribal governments with indigenous ties to Yucca Mountain and surrounding regions. The Group meets periodically to review, comment on, and recommend actions that concern aspects of the project including the Proposed Action and No-Action Alternative. It also reviews and comments on studies of cultural, historic, burial, and religious sites and

of potential impacts to traditional resources and resource use. This process ensures that American Indian concerns are considered in the ongoing government-to-government relationship between DOE and the tribes.

In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the FEIS, DOE committed to continue the Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. The FEIS reported that construction activities would have no direct impacts on several delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. However, because of the overall level of importance that American Indians attribute to these places, which they believe are parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. Based on tribal update meetings with the Consolidated Group of Tribes and Organizations since the completion of the FEIS, the American Indian viewpoint is unchanged. Nonetheless, DOE will continue to consult with tribal governments and to implement programs to minimize impacts to cultural resources.

DOE will respectfully treat human remains and funerary objects found on Federal land through consultation with appropriate tribal governments and consistent with the *Native American Graves Protection and Repatriation Act of 1990*. Human remains found on state and private land will be respectfully treated through consultation with appropriate tribal governments and consistent with Nevada Revised Statutes 383.150 through 383.190, Protection of Indian Burial Sites.

1.7.6 (2491)

Comment - RRR000686 / 0004

The commenter asked what studies DOE has completed related to cultural, historical, burial, and religious sites and the types of input requested from the Western Shoshone people. He expressed concern about impacts to a range of resource areas including plants (native, medicinal, edible), hunting, and fishing.

Response

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the late 1980s. Tribal representatives are appointed by their respective tribes to sit on a DOE-supported, committee called the Consolidated Group of Tribes and Organizations, which includes Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone tribal governments with indigenous ties to Yucca Mountain and surrounding regions. The Group meets periodically to review, comment on, and recommend actions that concern aspects of the project including the Proposed Action and No-Action Alternative. It also reviews and comments on studies of cultural, historic, burial, and religious sites and of potential impacts to traditional resources and resource use. This process ensures that American Indian concerns are considered in the ongoing government-to-government relationship between DOE and the tribes.

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), which it used as a reference in preparing the Yucca Mountain FEIS, the Repository SEIS, the Nevada Rail Corridor SEIS, and the Rail Alignment EIS. Other studies referenced in the Yucca Mountain

FEIS include, but are not limited to: DIRS 103464-DOE 1989, all; DIRS 104959-DOE 1990, all; DIRS 103196-DOE 1990, all.

In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the FEIS, DOE committed to continue the Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. The FEIS reported that construction activities would have no direct impacts on several delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. However, because of the overall level of importance that American Indians attribute to these places, which they believe are parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. Based on tribal update meetings with the Consolidated Group of Tribes and Organizations since the completion of the FEIS, the American Indian viewpoint is unchanged. Nevertheless, DOE will continue to consult with tribal governments and to implement programs to minimize impacts to cultural resources.

1.7.6 (3149)

Comment - RRR000121 / 0012

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Ethnic identity of the Western Shoshone people in land is diminished.

Response

DOE respects Western Shoshone ethnic identity and understands that the Tribe and other American Indians consider the Yucca Mountain area, as well as all environmental resource areas, to be culturally significant to their beliefs. DOE is not targeting tribal lands for repository development and is not attempting to diminish Western Shoshone identity. It is DOE's policy to avoid, rather than remove, cultural resources whenever possible. Where avoidance is not possible, the process would include tribal monitors in the recovery of the resources.

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the mid-1980s, and has supported the Consolidated Group of Tribes and Organizations, which consists of tribal representatives from the Southern Paiute, Western Shoshone, and Owens Valley Paiute and Shoshone. 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). This document presents tribal perspectives about the Yucca Mountain site, and used it extensively in the Yucca Mountain FEIS and Repository SEIS. The SEIS considers extensive cultural resources analyses, tribal perspectives, impact identification, and appropriate mitigation measures.

1.7.6 (3539)

Comment - RRR000929 / 0008

The commenter stated that the DOE analysis of cultural impacts was inadequate.

Response

Consistent with existing regulations and in consultation with the Nevada State Historic Preservation Office and tribal governments, DOE conducted a full cultural resources study and protection effort, which included an integrated ethnographic American Indian component, at Yucca Mountain. Chapter 3, Section 3.1.6.1 of the SEIS describes this effort.

1.7.6 (4039)

Comment - RRR000671 / 0058

Page S-28—S.3.1.5—Cultural Resources, Cont'd—The text describes an overview of a Programmatic Agreement that includes the CGTO to manage cultural resources during characterization of the Yucca Mountain Site. This matter was reviewed with the CGTO in November 2007 where it was stated by some tribes that the document had not been received and/or that another copy of the documents should be sent. Based on this information, the text should be modified to reflect that the DOE is required to maintain government-to-government relations with all tribes represented by the CGTO regardless if they choose to enter into a formal programmatic agreement.

Response

DOE understands the required government-to-government consultation process between tribes and fully supports it. The Department will continue government-to-government consultation regardless of whether tribes choose to participate formally in the programmatic agreement

1.7.6 (4086)

Comment - RRR000671 / 0070

Page 4-93 4.1.13.2.3 Cultural Resources—The text indicates that the DOE has implemented a worker education program on the protection of archaeological sites and artifacts and suggests limitations to direct and indirect impacts. The CGTO has previously requested to have tribal representatives attend their training to ensure accuracy of information. Moreover, the CGTO has recommended that tribal representatives be afforded the opportunity to provide educational training to workers associated with the Yucca Mountain Project. To date, the DOE has not afforded the CGTO the opportunity to become actively involved in worker education programs. Therefore, the text should be revised to provide an explanation for the oversight and/or an acknowledgment of the recommendation and desire to work collaboratively with the CGTO.

Response

DOE agrees with the Consolidated Group of Tribes and Organizations and will work collaboratively with the Group to involve tribal representatives in the worker education program.

1.7.6 (4090)

Comment - RRR000671 / 0074

Page 6-36 6.4.1.8 - Cultural Resources—The text limits ... identification of Western Shoshone Villages but does not identify Southern Paiute Settlements within the Area of Potential Effect. The text should be expanded to include this recommendation to maintain parity among groups represented by the CGTO.

Response

The text in question is meant to generally identify traditional locations important to certain American Indian ethnic groups in the area. A more complete discussion of these locations is found in *Additional Cultural Resources Baseline Data for the Yucca Mountain Nevada Transportation Scenario* (DIRS 155826-Nickens and Hartwell 2001, all).

DOE modified the text in Section 6.4.1.8 of the Repository SEIS to include Southern Paiute settlements as it included Western Shoshone villages along the Caliente rail corridor. There are no Southern Paiute villages identified along the Mina rail corridor.

1.7.6 (4122)

Comment - RRR000121 / 0002

The DOE has not addressed impacts of a geologic repository at Yucca Mountain to property interests of the Western Shoshone people. There is no prohibition against considering potential impacts to Newe Sogobia, only lack of will on the part of the DOE to consider the possibility of extant property ownership rights of the Western Shoshone people and the impact of loss of land rights to tribal society.

In the DOE Yucca Mountain site characterization process the DOE failed to identify Western Shoshone people as they actually exist and instead orchestrated events for the benefit of developing Yucca Mountain. The Repository SEIS reflects the selective inattention of the DOE in spite of efforts by the WSNC since at least 1985 to have tribal land ownership rights considered in the Yucca Mountain site characterization process. Focusing exclusively on cultural resource studies, DOE anthropologists from the University of Michigan, Institute for Social Research considered site-specific repository development concerns determined by the DOE. The anthropologists bent reality to match theory and DOE development goals, disrupting Western Shoshone living culture and violating the human rights of those they study.

The DOE cultural study produced “cultural triage” that forced the whole of Newe Sogobia into a funnel of cultural anthropology. The process produced the cultural destruction of Newe Sogobia for the benefit of the nuclear industry and the US government, effecting developmental genocide.

Response

The cultural resources program for the proposed repository site consists of two components, archaeological studies and Native American interactions and perspectives. DOE based the program on regulatory requirements of applicable federal and state agencies. Land at the repository site is entirely under the control of the Federal Government and DOE is evaluating it for the disposal of spent nuclear fuel and high-level radioactive waste under specific regulatory requirements. The Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them land rights to approximately one-third of the State of Nevada (including the Yucca Mountain region), along with portions of California, Utah, and Idaho. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury. DOE is aware that in the American Indian community there is significant disagreement with the Court rulings.

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the late 1980s. This program is part of DOE’s implementation of Council on Environmental Quality

Guidance on Environmental Justice that agencies should recognize the interrelated cultural, social, occupational, historical, or economic factors that can amplify the natural and physical environmental effects of the proposed agency action. In addition, tribal representatives sit on a DOE-funded, self-organized committee called the Consolidated Group of Tribes and Organizations. While the Group does not support the use of Yucca Mountain as a repository, it has agreed to remain involved in the process. DOE will continue to support the Group and the Native American Interaction Program.

During the preparation of the Yucca Mountain FEIS, DOE interacted with American Indian tribes on a range of topics to assess their viewpoints and perspectives. The Department 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), which it used as a reference in preparing the FEIS and this Repository SEIS.

1.7.6 (4142)

Comment - RRR000524 / 0026

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

Response

Since the completion of the Yucca Mountain FEIS, DOE has conducted intensive surveys, assessments, and periodic monitoring to identify, characterize, and better evaluate cultural resources in the analyzed land withdrawal area. While the Department did not survey the entire analyzed land withdrawal area, it made reasonable estimates of resource density, distribution, and significance from existing information. DOE will survey areas potentially affected by project-related activities before initiating the action.

The Yucca Mountain FEIS identified direct (physical) and indirect (nonphysical) impacts to archaeological and historic resources. Direct impacts would be those from ground disturbances or activities that destroyed or modified the integrity of archaeological or historic sites, and indirect impacts would be those from activities that could increase the potential for intentional or unintentional adverse impacts (for example, increased destructive human activity near resources or decreased beneficial human resource use). The FEIS concluded that, although there could be some indirect impacts, the overall effect of the proposed repository on the long-term preservation of archaeological and historic sites in the analyzed land withdrawal area would be beneficial. Limited access to and use of the area would protect archaeological and historic resources from destructive human intrusion without significantly limiting beneficial use.

A draft programmatic agreement among DOE, the Advisory Council on Historic Preservation, and the Nevada State Historic Preservation Officer has been prepared for cultural resources management related to activities that would be associated with development of a repository at Yucca Mountain. While this agreement is in ongoing negotiation between the parties, DOE is abiding by the process established in Section 106 of the *National Historic Preservation Act of 1966*.

1.7.7 Socioeconomics

1.7.7 (4230)

Comment - 7 comments summarized

Impacts Inyo County and CA

Several commenters stated that the EIS completely ignores or inadequately analyses or considers the impacts to Inyo County and/or the State of California.

Response

While geographic proximity to a proposed action may suggest that an area be included in region of influence, changes in the employment and worker residency of an area are the catalyst for socioeconomic impacts. A probable change in employment resulting from the Proposed Action is the primary factor for defining a region of influence for socioeconomic analysis. If there are no anticipated changes in employment in a given area, then it is not included in the socioeconomic region of influence. Although Inyo County California is nearby, historically, workers have not chosen to live in California while working at the Yucca Mountain Site or the Nevada Test Site. To identify the socioeconomic region of influence in the Repository SEIS, DOE estimated the residential distribution of the future anticipated workforce by considering where employees associated with the Yucca Mountain Project and the Nevada Test Site have historically resided. Based on these data, about 98 percent of the expected repository workforce would reside in Clark and Nye counties. Historical patterns of commuting and residency selection are the best available predictor of future commuting and work residency patterns. Therefore, neither Inyo County nor Death Valley, are part of the region of influence.

Maps (figures) in the SEIS document are included to supplement readers' understanding of the narratives. The figures reflect geographical areas discussed.

1.7.7 (4231)

Comment - 5 comments summarized

Impacts to Western Shoshone Tribes

Several commenters stated that they are concerned that there may be a potential economic loss to the Western Shoshone resulting from 1) restriction of use of land and 2) by public perception of safety of certain commodities that could provide viable business and industry opportunities unrelated to Yucca Mountain activities. Economic impacts in association with each of these limitations need to be analyzed for the proposed actions for each alternative considered.

Response

An analysis of potential impacts to socioeconomic variables, including potential impacts to those variables used to profile or define an area's socioeconomic conditions, is confined to the identified region of influence. The region of influence for the SEIS was determined to be Clark and Nye counties Nevada. The rational for defining the region of influence is discussed in Section 3.1.7 of the SEIS. The Environmental Justice sections of the SEIS evaluate the potential environmental justice impacts to minority populations, including Native American populations. Identifying potential socioeconomic impacts to populations or communities beyond the region of influence would be speculative because any impact would be widely diluted geographically.

1.7.7 (4232)

Comment - 2 comments summarized

Health Care Services and Facilities

Several commenters stated that Indian Health Services are not included in Draft SEIS and they should be included.

Response

DOE consulted the industry standard directory to identify hospitals and health care systems in Clark and Nye County. The American Hospital Association in its *2007 AHA Guide: America's directory of hospitals and health care systems* does not identify any Indian health care hospitals or health care systems in the region of influence (DIRS 181162-AHA 2007, all). Although the directory lists Indian Health Services in other areas, none were listed for Clark or Nye County. DOE also consulted the U. S. Department of Health and Human Services, Indian Health Service, which identified no Indian health care systems in Clark or Nye County. Health care institutions not listed by the directory or by the Department of Health and Humans Services may also be able to serve segments of the region of influence population.

1.7.7 (616)

Comment - RRR000124 / 0004

The commenter questioned the potential impacts to the Las Vegas tourist economy from the repository.

Response

Chapter 3 of the Repository SEIS qualitatively and quantitatively discusses the Leisure and Hospitality employment sector, which caters to tourists. The changes above and below baseline employment, employment without the repository, and estimates of employment with the repository discussed in Chapter 4 incorporate changes to this employment sector. Estimated changes to the sector are in the projected employment changes that would result from the Proposed Action. DOE relied on the REMI Policy Insight computer program to gauge employment changes to all types of industries in the region of influence.

1.7.7 (626)

Comment - RRR000059 / 0005

The commenter noted that Inyo County should be in the region of influence for socioeconomic analysis; otherwise, the analysis is inadequate.

Response

While geographical proximity to a proposed site is often correlated to historical and, therefore, predictable future residential distribution patterns and to county-to-county worker flow patterns, a number of variables can block this. Variables can include rivers without vehicle bridges; lands unsuitable or unavailable to support worker housing, including lands managed by government agencies; and inefficient transportation systems. The socioeconomic region of influence for the Repository SEIS is Clark and Nye counties. A probable change in employment resulting from the Proposed Action is the primary factor for defining a region of influence for socioeconomic analysis. Changes in employment drive changes in population, and a change in an area's population in turn is responsible for changes in its Gross Regional Product, real disposal personal income, and spending by local and state governments.

Changes in population are reflected in changed demand for housing and community services. Community services include law enforcement and other emergency response and services, medical facilities, and public schools. A change in employment triggers the socioeconomic changes or any socioeconomic impact. Thus, the counties in the region of influence are those that would experience socioeconomic impacts, if any, from the construction, operations, monitoring, and closure of a repository at Yucca Mountain. To identify the socioeconomic region of influence in the Repository SEIS, DOE estimated the residential distribution of the future anticipated workforce by considering where employees associated with the Yucca Mountain Project and the Nevada Test Site have historically resided. Based on these data, about 98 percent of the repository workforce would reside in Clark and Nye counties. Historical patterns of commuting and residency selection are the best available predictor of future commuting and work residency patterns. Historical and current project-related workers have demonstrated their preferences.

DOE defined the Rail Alignment EIS socioeconomic region of influence to include Clark and Nye counties and other counties through which a rail line would pass. The EIS contains the rail transportation-related socioeconomic impacts.

1.7.7 (1453)

Comment - RRR000867 / 0009

The draft SEIS mentions that the number of jobs would peak at 1,300—but what about when the repository closes and there are no jobs left and the community has more of a population with a large area of contaminated land that is inaccessible and unavailable for employing people.

Response

DOE projects the socioeconomic region of influence (Clark and Nye counties) would have an employment baseline of approximately 2,500,000 when the repository closed. The region of influence would be likely to be able to absorb the loss of fewer than 1,000 jobs.

1.7.7 (1586)

Comment - RRR000690 / 0031

Potential Impacts to lands and economic development outside the 50-mile radiological region, specifically to tourism in the Death Valley National Park area, which may impact the Timbisha Shoshone Tribe’s ability to sustain economic development.

Response

An analysis of potential impacts to socioeconomic variables, including impacts to variables used to profile or define an area’s socioeconomic conditions, is confined to the identified region of influence. DOE determined that the region of influence for the Repository SEIS is Clark and Nye counties in Nevada. Section 3.1.7 of the SEIS discusses the rationale for this determination. The Environmental Justice sections of the SEIS evaluate the potential for high and adverse impacts to minority, including Native American, populations that live within a 50-mile radius of the repository site. Identifying potential socioeconomic impacts to populations or communities beyond the 50-mile radius would be speculative because an impact would be widely diluted geographically and would not have a historical precedent.

1.7.7 (1612)

Comment - RRR000690 / 0015

The SEIS evaluates social and economic activities within the study area and makes a general statement concerning potential socioeconomic impacts that the percentage of value of changes would be low. However, the report is absent information concerning socioeconomic impacts to the indigenous economy within the study area. Additional [data] is required to provide a complete perspective of socioeconomic impacts to indigenous peoples. Within the YMP [Yucca Mountain Project] area there are several Indian reservations, tribal enterprises, tribally controlled schools, tribal police departments and tribal emergency response units, many of which are federally funded. The SEIS does not presently quantify the potential impact to these federally funded programs, i.e. whether, school or public safety or business employment would be adversely impacted. In addition, several tribes have shown interest in developing potential economic vehicles both within and near the study area. A full evaluation of all potential impacts to these indigenous services and businesses should be conducted. Studies should include, but should not be limited to:

- YMP affect on tribal members leaving the study and near by areas
- Potential impact on tribal salaries and employment
- Potential impact on Housing and Urban Development grants and funds
- Potential impact on federal Indian education monies
- Potential impact upon Indian police, fire and emergency response grant funding
- Potential impact on the loss of tribal culture and community as a result of the above potential socioeconomic impacts

Finally, a complete socioeconomic assessment would include specific data concerning the potential impacts upon "affected status" designated indigenous communities such as the Timbisha Shoshone. Such an assessment would include specific studies detailing any and all socioeconomic impacts upon the Timbisha Shoshone, its trust areas within and without the YMP area and in areas where high concentrations of its members reside.

Response

Two pieces of land belong to federally recognized American Indian tribes in the socioeconomic region of influence for the Repository SEIS. The Moapa Band of Paiute Indians of the Moapa River Reservation and the Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony have lands in Clark County. The population of the Moapa River Reservation and the Las Vegas Indian Colony is included in baseline estimates and projections and in estimated potential changes to those baseline projections from the Proposed Action for the two counties in the region of influence. Section 3.1.13 of the SEIS discusses minority populations, including American Indians. In 2006, the Bureau of the Census found that American Indians constituted 0.9 percent of the Clark County population and 1.7 percent of the Nye County population.

1.7.7 (1633)

Comment - RRR000657 / 0015

Comment: Section 4.1.6, page 4-40: At present, the socioeconomic parameters discussed in the repository SEIS are the following: Population; Employment; Government spending; Real disposable income; and Gross regional product.

Resolution: The socioeconomics baseline, existing and future, with and without the Yucca Mountain Project, needs to be quantified for Nye County to include the following: Location of existing housing stock in Nye County; Construction of future housing developments in Nye County; Public finance levels (existing and future); Existing and predicted (based on population) levels of service for public education, sheriff protection, fire protection, health care, and infrastructure in Nye County. As most of its long-term activities would be located in Nye County, the location of residences of future workers tied to the Yucca Mountain Project is extremely important. The housing stock and future development discussion will assist in determining the most logical residence of future workers, whether the workers would be the result of direct activities of the Proposed Action, indirect actions (for example, office machine suppliers or office cleaning services), or induced events (mechanics or school teachers). The worker discussion will lead to a more realistic determination of public finance and population levels, thereby leading to realistic required levels of service for public education, sheriff protection, fire protection, health care, and infrastructure. With a proper monitoring program, the socioeconomic and fiscal impacts can be determined with respect to these issues, and a fair determination of the socioeconomic impacts of the Yucca Mountain Project on Nye County can be ascertained.

Response

The Repository SEIS contains baseline estimates and projections for five socioeconomic variables at the county level. Given the difficulty inherent in identifying and defining the "boundaries" for the many unincorporated communities in the region of influence, counties are the smallest geographic unit for which DOE developed estimates and projections. Although not in the SEIS discussions, the location of existing housing stock in any community is readily available to interested parties. Predicting the location of future housing is speculative and outside the scope of this socioeconomic analysis. Given the long lead-in time of the Proposed Action, the private housing market is likely to react to new opportunities. Local and county governments can guide future residential development through existing processes. Public services would grow at nearly identical rates to the rates of population growth because the new residents would contribute revenues to the tax base. Information in the SEIS lays the foundation for additional collaboration between Nye County and DOE to address issues that could arise from the Proposed Action. Collaborative efforts could include additional studies and monitoring of the socioeconomic conditions.

1.7.7 (1659)

Comment - RRR000657 / 0012

Comment: Sections 3.1.7.5.1, 3.1.7.5.2, 3.1.7.5.3, 3.1.7.5.4, Pages 3-67, 3-68, 3-69: These sections state that "Nye County school officials report that all schools in the county are at capacity and that those in Pahrump exceed design capacity." It goes on to maintain that in "2005, the Nye County Sheriffs office had 141 employees, including 102 commissioned officers—a ratio of 2.5 commissioned officers per 1,000 residents." For fire protection, the sections state: Nye County is hampered by its rural nature and size; assistance from mutual aid departments is often an hour away. Many conventional developed neighborhoods in the county lack fire hydrants. Most of the Town of Pahrump is outside the nationally

recommended radius of 5 kilometers (3 miles) to achieve a 4 to 5 minute response time .... As for health care, the sections state "most people in the southern part of the [Nye] county use local clinics or go to hospitals in metropolitan Las Vegas."

Resolution: When the number of direct, indirect, and induced workers is established (along with their estimated number of dependents), a suitable analysis can be completed. It may be concluded that, as a direct result of the Yucca Mountain Project, an additional school or more classrooms would need to be built, and more career fire personnel will be required (the Amargosa Valley Fire Department, for example, has 23 volunteer firefighters and one career firefighter). Impacts to public education, sheriff protection, fire protection, and health care from the construction and operations activities of the Yucca Mountain Project can be ascertained once the socioeconomic baseline with and without the Project is established through a monitoring program. Residency decisions of new repository workers should be determined, and mitigation measures should be jointly planned, developed and adopted through appropriate agreements between Nye County and DOE. A reference to the Nye County perspective (sections 8.6.2 and 9.2.3) should be made in this section as well.

Response

Section 4.1.6.1.5 of the Repository SEIS discusses potential impacts to public services, including impacts to schools, that could arise from the Proposed Action. Nothing in Chapter 3 or Chapter 4 of the SEIS precludes Nye County and DOE from joining in a collaborative study of issues and resolutions to those issues that could arise from the Proposed Action. Nye County has recently experienced rapid growth that continues to stress existing infrastructure systems. The baseline population projections for the county, the estimates of population without the repository, reflect this continued growth. The County will determine, on an ongoing basis, the best way to continue to provide services to its growing resident base. Changes in county population, including children who would attend public schools, that resulted from the Proposed Action could be a small contributor to overall growth rate. The Nye County public school system is currently addressing a system at capacity.

1.7.7 (1660)

Comment - RRR000657 / 0011

Comment: Section 3.1.7.4, third full paragraph, page 3-67: Nye County agrees with the assertion that "new residents would cause additional net deficits under the existing revenue structure."

Resolution: A fiscal impact analysis, of the Yucca Mountain Project focusing on government services, should be completed to ascertain the economic impacts to Nye County. This should be part of the DOE-supported Nye County study documenting the socioeconomic baseline with and without the Yucca Mountain Project. Residency decisions of new repository workers should be determined, and the resulting effects to the various socioeconomic conditions (for example, education, sheriff and fire protection, health services, and infrastructure) should be established. Once recognized, mitigation measures should be jointly planned, developed and adopted through appropriate agreements. In addition, a reference to the Nye County perspectives (sections 8.6.2 and 9.2.3) should be made in this section.

Response

The Repository SEIS has established that some infrastructure systems in Nye County are at or near capacity and that, under the current revenue structure, project-related in-migration would contribute to additional strains on those systems. Information in the SEIS lays the foundation for additional

collaboration between Nye County and DOE to address issues that could arise from the Proposed Action. Collaborative efforts could include additional studies and monitoring of the socioeconomic conditions.

1.7.7 (1691)

Comment - RRR000657 / 0008

Comment: Sections 2.1.4.3 through 2.1.4.7, page 2-39: Various repository support facilities are discussed in these sections.

Resolution: To the extent practical, the repository support facilities should be developed on private property near the repository so these facilities would be included in the local tax base and provide economic opportunities to local residents.

Response

DOE is very open to the concept, to the extent practical, of constructing some support facilities, such as the new sample management facility, on private land.

1.7.7 (1694)

Comment - RRR000657 / 0004

Comment: Section S.3.1.6, page S-28, this section states "...by any measure, impacts to employment in Clark and Nye counties from repository-related construction and operations would be small." Nye County does not agree with this statement and finds it inconsistent with other statements in the Draft Repository SEIS.

Resolution: Delete the words, "...by any measure." At a minimum, there should be a reference to the relative likely difference in impacts based on the population difference between Clark and Nye counties, as noted in Sec. 4.1.6, p 4-40.

Response

DOE agrees with this comment and has deleted the phrase "by any measure" from the discussion in Section S.4.1.6 of the Repository SEIS.

1.7.7 (1793)

Comment - RRR000657 / 0001

As noted in our original scoping comments, Nye County does not agree with some of the assumptions in the socioeconomic analysis, specifically the percentage of the work force that will reside in the County. DOE has acknowledged the uncertainty in assumptions based on historical patterns and addressed the County's concerns through the alternative analysis that appears in Appendix A.4. Nye County continues to believe that the residency trends associated with factors such as those identified on page A-8 will result in a greater percentage of repository personnel choosing to reside in Nye County than is assumed.

While the Draft Repository SEIS recognizes that the socioeconomic impacts of the proposed action on Nye County are substantially larger than on Clark County because of their significantly different populations, the socioeconomic analysis based on historical patterns concludes that, in spite of these differences, the potential impacts are "small." Nye County notes that the impacts might be small relative to conditions in Clark County, but does not agree that the potential impacts to Nye County will be small, even for the base-case residency scenario. With limited housing, infrastructure, and public services, Nye County may find itself hard pressed to absorb the impacts without a cooperative agreement with DOE for

mutual aid and support. As correctly noted in the Draft Repository SEIS, impacts on public services such as education and public safety could require mitigation. Nye County fully agrees with this assessment and, consistent with its position on mitigation as outlined below, proposes to develop appropriate agreements and to implement an adaptive management approach in cooperation with DOE to monitor repository related impacts and to identify and implement effective planning and mitigation measures.

Response

Information in the SEIS lays the foundation for additional collaboration between Nye County and DOE to address issues that could arise from the Proposed Action. Collaborative efforts could include additional studies and monitoring of the socioeconomic conditions.

1.7.7 (1798)

Comment - RRR000622 / 0008

The commenter stated that rural Nevada has had severe problems brought on by boom and bust cycles and Yucca Mountain would likely create the same problems if DOE built the rail line and the repository facilities at the same time. The commenter noted that the Repository SEIS does not analyze this situation.

Response

Section 8.4.2 of the Repository SEIS addresses potential impacts to the region of influence from rail construction and operations activities occurring at the same time as repository activities.

1.7.7 (1904)

Comment - RRR000677 / 0015

Socioeconomic Issues

The SEIS does not adequately address the socioeconomic impacts on the region from constructing and operating the Yucca Mountain repository.

a. Employment Impacts

Currently, the Rocky Mountain region is the fastest growing region in the nation, experiencing a growth rate in 2005 of 5.2 percent. 2007 Economic Report to the Governor, State of Utah at 77. In 2006, Utah experienced a 5.2 percent job growth, with 18.1 percent growth in the construction sector. Id. at 55. The Utah unemployment rate averaged 3.3 percent in 2006. Utah Economic Report at 57. The State of Utah is already concerned that its 3.3 percent unemployment rate will be incapable of supplying Utah's economy with an adequate labor force and questions whether the Yucca Mountain project will substantially impact Utah's labor force. DOE plans to initiate construction of the Yucca Mountain repository in 2012. In 2014, DOE estimates it would employ 2,590 workers, peaking at 2,690 employees in 2019. SEIS at 4-42 to 43. In planning for a construction worker housing camp (see SEIS at 2-39), DOE expects that many of the construction employees will come from outside Nye and Clark counties, Nevada. DOE has not adequately analyzed the effect on the regional labor pool from the workforce needed for the Yucca Mountain Project. The final EIS must evaluate the regional impacts on economic development and growth from the construction and operations of the Yucca Mountain repository.

Response

DOE examined the existing labor pool in the area within a reasonable commuting distance of the proposed repository and determined that the labor force was of insufficient size and skill mix to provide all workers necessary for repository construction and operations. While DOE recognizes that individuals

will migrate to the region of influence for work, there is no reliable method to identify the areas from which these workers would come.

1.7.7 (2149)

Comment - RRR000657 / 0018

Comment: Page 4-49, excerpts from first full paragraph: It is agreed that impacts would be greater in Nye County, but it is disagreed that they would be "still small." This statement is also inconsistent with the statements in the preceding section, 4.1.6.1.5, regarding the potential strains on Nye County.

Resolution: This section should reflect the statements in the preceding section and reference Nye County's perspective on cumulative impacts, section 8.6.2, and mitigation, 9.2.3.

Response

Nye County is experiencing rapid growth, which continues to stress existing infrastructure systems. The baseline population projections for the county, the estimates of population without the repository, reflect this continued growth. The county will determine, on an ongoing basis, the best way to continue to provide services to its growing resident base. The changes in the Nye County population that resulted from the Proposed Action are likely to be a small contributor to overall growth rate.

1.7.7 (2151)

Comment - RRR000657 / 0017

Comment: Section 4.1.6.1.3, Tables 4-14 and 4-15, pages 4-46 and 4-47: Total "State and local government spend" in Nye County as a result of the Yucca Mountain Project would be $700,000 during the peak year for construction activities and $500,000 during peak operations activities. It is unclear whether the dollar amounts in these tables are to cover all construction and operations costs incurred by Nye County. Further, it is not clear which portion would be borne by Nye County and which by others, such as the Nye County School District. With the implementation of the Project, Nye County would incur a multitude of economic effects resulting in the need to provide services for new workers (direct, indirect, and induced). These will include the expansion of emergency services and equipment (for example, fire, police, and emergency medical); and additional education, medical, water, sewer, trash, road services, and infrastructure.

Resolution: One of the major questions to answer in the Repository SEIS is: What are the economic impacts of the Yucca Mountain Project to Nye County, and how should these impacts be mitigated? According to the Nye County Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2006, the primary revenue source of Nye County for governmental activities is property taxes, and the greatest expenses are for general government and public safety functions. Nye County's responsibility to its residents is to determine the demand that the Project would place on Nye County services and its budget and whether the flow of revenues from DOE and the Project in the form of PETT [Payments Equal to Taxes] and ad valorem taxes and other taxes (from direct, indirect, and induced workers) would balance incurred costs. A fiscal impact analysis based on monitoring certain economic activities of the Yucca Mountain Project would determine its fiscal impacts on Nye County. This should be started as soon as possible to determine the fiscal baseline, and should be part of the monitoring program to document the socioeconomic baseline with and without the Yucca Mountain Project.

Response

School districts are a form of local government. The analysis evaluates impacts to local governments that include, for example, municipal governments, the county government, school districts, and special taxing districts. Chapter 4 of the Repository SEIS discusses changes above or below baseline projections that would occur from the Proposed Action. The values presented in the SEIS represent additional governmental expenditures, beyond those likely to occur without the project. The estimate is a gross value, meaning that DOE has not applied additional governmental revenues generated by project-related workers to the estimate of additional expenditures.

Information in the Repository SEIS lays the foundation for additional collaboration between Nye County and DOE to address issues that could arise from the Proposed Action. Collaborative efforts could include additional studies and monitoring of socioeconomic conditions.

1.7.7 (2152)

Comment - RRR000657 / 0016

Comment: Section 4.1.6, page 4-40: This section discusses socioeconomics and recognizes that Clark County and Nye County are different.

Resolution: This section should be expanded and be reflected in meaningful discussions pertaining to Nye County socioeconomic factors. A reference to the Nye County perspective (sections 8.6.2 and 9.2.3) should be made in this section. A monitoring program should be established as part of a program for adaptive management to document the socioeconomic baseline with and without the Yucca Mountain Project. Residency decisions of new repository workers should be determined, and the resulting effects to various socioeconomic conditions should be established. Once recognized, mitigation measures should be developed and adopted through appropriate agreements between DOE and Nye County.

Response

Information in the SEIS lays the foundation for additional collaboration between Nye County and DOE to address issues that could arise from the Proposed Action. Collaborative efforts could include additional studies and monitoring of the socioeconomic conditions.

1.7.7 (2341)

Comment - RRR000522 / 0010

DOE does not anticipate that any activities associated with the construction or operation of the repository will impact the County. However, White Pine County believes there may be employment impacts due to transportation, material, and manpower needs associated with construction and operations of the Yucca Mountain repository.

If White Pine County or the City of Ely experience out-migration due to stigma effects of being located on a transport corridor for high-level nuclear waste, reduced property values, and/or loss of potential new residents may result and there will be a negative impact on employment.

There are no DOE scenarios of the Yucca Mountain repository that anticipate an impact (positive or negative) on the population of White Pine County or the City of Ely presented in the Repository DSEIS. There are, however, two scenarios, not identified by DOE that might result in a negative impact on population. First, employment opportunities at the repository might encourage an outflow of residents as they seek employment closer to the site. Second, if there are stigma-related effects, some residents may choose to leave and other potential new residents may decide to look elsewhere for a community that is

not associated with the transport of high-level nuclear waste. The majority of the urbanized area in Ely, McGill and the Preston/Lund community areas along potential highway transportation routes through White Pine County is within the 800 meter corridor utilized in the RADTRAN transportation risk model as the assumed radiological exposure zone. Along the Ely-McGill and Preston-Lund highway corridors, agriculture, an activity highly sensitive to stigma, is the predominant land use (approx. 800 acres) within the 800 meter risk zone.

Response

A socioeconomic analysis begins with an estimate, based on historical commuting patterns and existing labor force conditions, including the composition of a labor force by labor skills, of the areas (defined as inside or outside the region) likely to provide the necessary workforce for a proposed action. The direct employment of the proposed action drives indirect and induced employment changes. Indirect and induced employment is also a result of purchases of project-related goods and services including construction materials and transportation services. The REMI Policy Insights computer program incorporates data that measure a given community's existing businesses to provide the required project-demanded good and services. Large urban areas, with a variety of large businesses, are more readily available to provide project-related goods and, therefore, are more likely to experience changes in employment then areas with a smaller Gross Regional Product. Because the Las Vegas metropolitan area dominates southern Nevada and is within a reasonable distance to transport the necessary materials, vendors in Clark County would provide the majority of goods and services.

Socioeconomic analysis does not include an evaluation of potential changes in transient populations, including tourists. However, DOE has received comments saying that the SEIS should analyze perception-based and stigma-related impacts, including impacts to the tourist industry that could arise from the construction and operations of a repository. In considering these comments, DOE recognizes that perceptions depend on the underlying value systems of the individual forming the perception. Perception-based impacts would not necessarily depend on the actual physical impacts or risks from repository operations. Further, people do not consistently act in accordance with negative perceptions; therefore, the connection between public perception of risk and future behavior would be uncertain or speculative at best. For these reasons, DOE determined that including analyses of perception-based and stigma-related impacts would not provide meaningful information.

DOE has determined, based on historical data of residency preferences of Yucca Mountain and Nevada Test Site employees, that the majority of workers have chosen to live Clark or Nye County. The *Yucca Mountain Project Socioeconomic Monitoring Program Employment Data Report October 2004 through March 2005* (DIRS 180788-BSC 2005, all) (the latest period for which the information is available) reports that no in-migrating worker at the site moved from White Pine County.

1.7.7 (2709)

Comment - RRR000737 / 0021

The commenter indicated that DOE should include actual employment estimates for the No-Action Alternative and the Preferred Action.

Response

The No-Action Alternative would result in a net loss of jobs in the socioeconomic region of influence for the Repository SEIS. Individuals are currently employed and engaged in research and preparatory work for the Proposed Action. If DOE dropped the Proposed Action from consideration, there would be no

need for ongoing research, study, and other preparatory activities. In the absence of a project-related mission, there would be no work and no need for workers. The estimated loss of jobs under the No-Action Alternative includes direct and indirect workers.

1.7.7 (2735)

Comment - RRR000712 / 0003

The commenter stated that the analysis of socioeconomic impacts was inadequate.

Response

The analysis of socioeconomic impacts is adequate. The analysis compared the impacts to each of five socioeconomic variables in the two-county region of influence to baseline projections and estimates for those variables. Section 3.1.7 of the SEIS discusses these baseline environments in the region of influence, and Chapter 4 discusses probable impacts to that environment.

1.7.7 (3039)

Comment - RRR000681 / 0008

DOE does not acknowledge the important role Clark County will play in occupational and public health and safety. Adequate medical care does not exist in Nye County to support potential accidents at the site or during rail construction. Clark County's University Medical Center (UMC), located in Las Vegas, has been acknowledged by DOE in public meetings as the preferred location for addressing worker and public injuries resulting from the repository. UMC operates as a regional provider of emergency, trauma, burn, and decontamination services. The burden for providing these services will remain a Clark County responsibility and concern unless DOE and/or Nye County is able to fully support any potential accidents, incidents, or long term care for individuals requiring medical services as a result of the repository operation or rail construction.

Response

DOE acknowledges the role that Clark County plays in regional health care services in Section 3.1.7.5.2 of the Repository SEIS. Section 4.1.7 of the SEIS describes only the potential health and safety impacts to workers (occupational impacts) and to members of the public (public impacts) from construction, operations, monitoring, and eventual closure of the proposed repository.

1.7.7 (3129)

Comment - RRR000524 / 0032

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

Response

DOE agrees that the SEIS should discuss the socioeconomic impacts of repository closure. The Department has added a discussion of such impacts to the socioeconomic environment in the region of influence from the extended monitoring and closure of the repository.

1.7.7 (3371)

Comment - RRR001011 / 0001

The commenter asked if the project would produce jobs.

Response

The Proposed Action should result in thousands of direct and indirect jobs. It would result in jobs in almost all employment sectors and occupations. It would employ approximately 2,600 workers during the peak period of construction. This would represent approximately 1,100 new jobs. During the peak employment period of the emplacement period, the project would directly employ an estimated 2,700 workers.

1.7.7 (3590)

Comment - RRR000176 / 0007

The commenter stated that the Yucca Mountain Repository and the "transportation enhancement project" will mean thousands of good science, engineering, construction, and related jobs for Nevada.

Response

The Proposed Action should result in thousands of direct and indirect jobs. It would result in jobs in almost all employment sectors and occupations. It would employ approximately 2,600 workers during the peak period of construction. This would represent approximately 1,100 new jobs. During the peak employment period of the emplacement period, the project would directly employ an estimated 2,700 workers.

1.7.7 (3629)

Comment - RRR000737 / 0020

Under the "no-action" alternative it is stated:

Loss of approximately 4,700 jobs (1,800 person workforce for decommissioning and reclamation, 1,400 person engineering and technical personnel in locations other than the repository site, and 1,500 indirect jobs)in the socioeconomic region of influence. DOE/EIS-0250F-SID, pg. 2-67.

This is an improper impact assessment. Under the "No-Action" there would not be any of these jobs to loose. One could also speculate on job "losses" from lack of shipping waste. Following the analysis job losses should also be counted under the preferred action due to lack of construction of extensive and ongoing on-site storage facilities.

Response

DOE currently employs individuals in research and preparatory work for the Proposed Action. If DOE dropped the Proposed Action from consideration, there would be no need for ongoing research, study, and other preparatory activities. In the absence of a project-related mission, there would be no work and no need for workers. The estimated loss of jobs under the No-Action Alternative includes direct and indirect workers.

1.7.7 (3724)

Comment - RRR000994 / 0001

The commenter stated that the Repository SEIS should consider potential impacts to the dairy industry in Amargosa Valley.

Response

The computer program DOE used to develop baseline estimates and projections for each of the five socioeconomic variables captured the dairy industry, which is part of the "Farm" industrial sector, as an input variable. The program aggregates impacts for the entire industry. Thus, the program outputs account for potential project-related impacts.

1.7.7 (4048)

Comment - RRR000671 / 0067

Page 3-68 3.1.7.5.3—Law Enforcement—The text limits its analysis to the Las Vegas Metropolitan Police Department and Nye County Sheriff's Department. There is no discussion about tribal police departments and those officers commissioned through the Bureau of Indian Affairs. The text should be expanded to include these entities including the number of employees and ratios, etc. so that a proper analysis can be made.

Response

Although there are several tribal police departments elsewhere in Nevada, there is none in the region of influence. The Bureau of Indian Affairs does not have commissioned officers in the region of influence.

1.7.7 (4049)

Comment - RRR000671 / 0068

Page 3-69 3.1.7.5.4—Fire Protection—The text only identifies the [Cities] of Las Vegas, North Las Vegas, Boulder City and the Clark and Nye County Fire Protection District Department. There is no mention of information from the National Park Service Fire Department in Death Valley or Volunteer Fire Departments that work in various tribal and/or smaller communities within the Area of Potential Effect. Therefore, the text should be expanded to include this information.

Response

Death Valley is outside the socioeconomic region of influence; therefore, DOE did not include the National Park Service Fire Department in the Repository SEIS analysis. Volunteer fire departments, which often protect small communities, are not required to report or provide information to national data-gathering agencies or to the State Fire Marshall. Because reporting is voluntary, an analysis might not capture information on some smaller fire departments.

1.7.7 (4140)

Comment - RRR000524 / 0024

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

Response

DOE has expanded the discussion of Payments-Equal-To Taxes to present the contribution of such payment in Nye County better. In 2005, Nye County had budgeted expenditures of approximately $28.3 million and estimated revenues of $29.5 million. In the same year, Payments-Equal-To Taxes to the County totaled $10.5 million.

1.7.8 Occupational and Public Health and Safety

1.7.8 (268)

Comment - RRR000330 / 0003

The commenter stated that it is important that DOE use the reference family rather than the reference man. The reference family would not emphasize a middle-aged man but rather a woman and fetus, which are the most at-risk part of the human species.

Response

The EPA regulation requires that DOE use data from a survey of local inhabitants and lifestyles to develop the characteristics of the reasonably maximally exposed individual (RMEI). The RMEI represents a hypothetical individual who would be most at risk (see Chapter 5) because of the characteristics of the RMEI's lifestyle which are established by regulation (40 CFR 197.21). The RMEI provides the basis for the calculation of projected dose. The conversion to health effects using standards established by the International Council on Radiation Protection accounts for details on specific sensitivities of members of the population. This conversion is conservative. However, the estimated impacts of postclosure performance, even for the 95th percentile (only 5 percent of the doses would be higher), indicate the probability of an individual health effect of less than 1 in 100,000. In other words, small differences for specific sensitive individuals would amount to small changes in an already very small number.

1.7.8 (326)

Comment - RRR000095 / 0001

The commenter expressed the need for a notification/emergency response system in the event of leaks.

Response

DOE would develop an Emergency Plan, consistent with 10 CFR 72.32(b), and submit it to the NRC no later than 6 months before the submittal of the updated application for a license to receive and possess spent nuclear fuel and high-level radioactive waste. The criteria established by 10 CFR 72.32(b) include specific requirements related to the notification and response associated with various potential accidents and incidents.

1.7.8 (410)

Comment - RRR000329 / 0003

The Yucca Mountain plan proposal presents an additional threat to human health and life through its transportation plan. If the current stock of commercially generated nuclear waste is shipped by truck to a repository like Yucca Mountain, one shipment every four hours, twenty-four hours a day for thirty-eight years, at least, would cross the United States through forty-five states. The draft supplemental environmental impact statement that we're speaking about today estimates that if there were no major

accidents, five people, one member of the public and four transportation workers, would die of cancer from the transport of this radioactive waste within fifty years. However, DOE assures us in this statement that, "This number of fatalities, which would occur over as many as fifty years, would not be discernable from the 600,000 people who would die from cancer every year in the United States." I assure you that to PSR, every loss of life is discernable and matters. A policy that allows for loss of life is not ethical.

Response

The NWPA finds that the Federal Government has the responsibility to transport and dispose permanently of spent nuclear fuel and high-level radioactive waste to protect public health and safety and the environment. The Department takes the protection of the public and worker health and safety very seriously and conducts all activities in accordance with applicable regulations and best management practices, including as-low-as-reasonably-achievable radiation protection practices. The SEIS discusses mitigation measures, including administrative controls, to provide further protection to members of the public and workers.

1.7.8 (412)

Comment - RRR000329 / 0005

It is ... critical that I bring to the attention of DOE and to the public that recent research on the effects of ionizing radiation ... prove that very small doses of radiation from the storage or transport of this waste could lead to fatal cancers that once were thought to result only from high level doses of radiation.

Ionizing radiation in high level doses produced immediate damage, like skin burns, hair loss, and bone marrow destruction. But low doses are less predictable. The effects are not immediately visible, and involve the cancerous transformation of cells. Seven reports since 1956 have been published by the National Research Council's Committee on Biological Effects of Ionizing Radiation. The reports address the potential health effects from exposure to low doses of radiation.

Since 1990, the committee has supported the linear no-threshold model hypothesis. This hypothesis states that all exposure to radiation, no matter how small the dose, presents some risk to human health. The most recent committee report BEIR 7, calculated the expected cancer risk from a singular exposure of .1 sievert. The committee found that in a lifetime, approximately forty-two of one hundred people will be diagnosed with cancer, and one cancer of these one hundred people will result from a single exposure of .1 sievert over low level radiation above background. There is still a lack of scientific certainty over what level of radiation exposure leads to cancer. Mostly due to difficulty in proving causal link between a specific radiation exposure and adverse health effects. However, the likely risk is sufficient reason to prevent the Yucca Mountain policy from moving forward, since it will likely expose workers and hundreds of US communities to low levels of radiation.

Response

The Repository SEIS describes the potential impacts of the Proposed Action. DOE has described those impacts throughout the document and provided information on which an informed decision can be made. The Department conducts all activities in accordance with applicable regulations and best management practices, including as-low-as-reasonably-achievable radiation protection practices. Where appropriate, DOE has identified mitigation measures, including administrative controls, to provide further protection to members of the public and workers. The health and safety impacts presented in the Repository SEIS are based on the linear no-threshold model hypothesis.

1.7.8 (918)

Comment - RRR000662 / 0010

The Draft SEIS makes no mention of a detailed radiological survey of the entire proposed land withdrawal area. Since much of the land is in Area 25 of the Nevada Test Site which was previously used to test experimental nuclear rocket engines, DOE should provide current data and analyses demonstrating that there is no residual contamination of the site before it is separated from the Nevada Test Site, whose responsibility it would be to carry out any needed decontamination. Offsite gamma contamination from a rocket motor test is known from at least one test in 1968, and there was a later report in the media that some irradiated rocket fuel had been buried somewhere in Area 25. At the time, DOE deferred any search for the missing material.

Response

DOE recently investigated residual radioactive materials that could be present from historical test activities. The survey results indicate that there is no residual radioactive material in the proposed land withdrawal area at levels that would exceed health and safety guidelines or preclude project activities (DIRS 184239-BSC 2006, all).

1.7.8 (942)

Comment - RRR000454 / 0001

In February 2002, DOE submitted 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 (FEIS). Since 2002, DOE has continued developing the Yucca Mountain repository design, construction, and operation plans. The SEIS is meant to supplement the FEIS by considering the potential environmental impacts of the current design parameters. The SEIS also updates the impact of transporting spent nuclear fuel and high-level radioactive waste to the repository based on DOE decisions made after completion of the FEIS.

The entire project is expected to last 105 years including 5 years of construction, 50 years of operation, 50 years of monitoring and a 10 year closure period which will overlap the 50 year monitoring period.

The primary changes in the SEIS compared to the FEIS are:

- The population projections have changed. The SEIS assumes operations will begin in 2017 and continue 50 years; therefore, the population projection was updated to the year 2067. The FEIS population projection was for the year 2035.

- The SEIS used CAP88-PC Version 3 to calculate collective dose to the public and dose to the maximally exposed individual. CAP88-PC has been approved and validated by EPA.

- In the SEIS, DOE used a latent cancer fatality conversion factor of 0.0006 per person-rem. This conversion factor is recommended by the Interagency Steering Committee on Radiation Standards which is composed of several federal and state agencies including the CDC. In contrast, the FEIS used two conversion factors: 0.0004 per person-rem for workers and 0.0005 per person-rem for the public. The resulting health impact in the SEIS is greater than that estimated by the FEIS.

- DOE used a conservative approach in determining the potential doses to the public. For example, it was assumed that the maximally exposed member of the public would reside continuously for 70 years at the site boundary in the prevailing downwind direction.

- Doses and health impacts were estimated for the entire 105 year project period.

  - The highest estimated dose in any one year to the maximally exposed member of the public is 6.8 millirem. This is less than 4 percent of the annual 200 millirem average background dose to the public from ambient levels of naturally occurring radon-222 and its decay products.

  - The collective dose for the projected population of 17,000 persons within 80 kilometers of the repository is 13,000 person-rem. The SEIS projects this population will receive 2.5 million person-rem during the same 105 year period due to natural background radon exposure. Therefore, about 99 percent of the potential population dose will result from exposure to naturally occurring radioactive materials.

- DOE identified and analyzed 14 accident scenarios which could happen during the 105 year project period. The accident scenario that would result in the highest offsite population impact would be the drop and breach of a canister containing spent nuclear fuel assemblies. The estimated health impact to the offsite population in this scenario would be less than 1 additional latent cancer fatality.

- DOE analyzed hypothetical sabotage events and determined the scenario resulting in the greatest public health impact involved a high energy density device penetrating a rail or truck cask. There would be 28 latent cancer fatalities in an exposed urban population. If the event occurred in a rural area, the probability of a single latent cancer fatality in the exposed population is estimated to be 0.055.

- DOE estimated the health impact to the population from exposure to spent nuclear fuel and high-level radioactive waste during transport to the repository.

  - For incident-free transport, there would be about 1 latent cancer fatality among members of the public. The maximally exposed member of the public is considered to be a service station attendant who could receive 0.21 rem over 50 years of shipments. This is based on very conservative assumptions.

  - The worst case transportation scenario would involve a high-temperature, long-duration fire that engulfs a cask. For an urban area, the population dose would be about 16,000 person-rem resulting in an estimated 9 cancer fatalities. For a rural area, the population dose would be about 21 person-rem with an estimated likelihood of a latent cancer fatality of 0.012. In a fire scenario, the maximally exposed member of the public (urban or rural) could receive 34 rem resulting in a probability of latent cancer fatality of 0.02.

- The SEIS provided projections of doses and radionuclide concentrations for two postclosure periods:

- The period up to 10,000 years after repository closure would result in a mean and median annual individual dose that would not exceed 0.24 millirem and 0.12 millirem respectively to the reasonably maximally exposed individual (REMI).

- The post-10,000-year period would result in a mean and median annual individual dose that would not exceed 2.3 millirem and 0.98 millirem respectively to the REMI.

Conclusion: The public health impacts estimated by the SEIS are minimal and based on conservative assumptions. The methods used to calculate these results are widely accepted by advisory groups and federal regulatory agencies.

Response

Comment noted. Thank you for your comment.

1.7.8 (965)

Comment - RRR000617 / 0019

The Repository DSEIS fails to fully disclose potential repository system impacts. For example, the DSEIS analyzes radiological health impacts through atmospheric pathways only in those locales and to the extent thought by DOE to be required by NRC and fails to disclose similar potential effects to populations living [within] the region surrounding Yucca Mountain that may also be affected by implementation of a implement rail-dependent TAD-based repository system.

Response

DOE has established the appropriate radiological region of influence in its SEIS (see Appendix D). Outside of that region, airborne concentrations from any release would have decreased to a value indistinguishable from background.

1.7.8 (1482)

Comment - RRR000737 / 0018

The commenter suggested that DOE evaluate radiological impacts in addition to latent cancer fatalities.

Response

The risk for nonfatal cancers or sickness is about 2 times that of fatal cancers. The Yucca Mountain FEIS and Repository SEIS provide information on nonfatal cancer risks in addition to latent cancer fatalities (see Appendix D, Section D.1.10).

1.7.8 (1574)

Comment - RRR000690 / 0043

Potential contamination of traditional food sources such as wood, grasses, pinion nuts, animal protein.

Response

In the Final SEIS, the biosphere model parameters developed for the entire Amargosa Valley are used to calculate estimated dose to the maximally exposed member of the public at Amargosa Valley (see Appendix D, Section 4.1.1 and DIRS 177399-SNL 2007, all). Potential ingestion dose from consumption of contaminated foods includes eggs, fruit, grain, leafy and root vegetables, meat, milk, and poultry. The Yucca Mountain FEIS evaluated Additional unique pathways and resources, although none revealed a

potential for disproportionately high and adverse impacts. For example, DOE estimated the potential health impacts from a subsistence diet based primarily on game taken from lands near the repository exclusion areas and concluded that high and adverse health and safety impacts would be unlikely.

1.7.8 (1610)

Comment - RRR000690 / 0016

Although the SEIS assumes that the exposure to radiation both by non-workers and workers will be low, the SEIS is absent any information concerning indigenous peoples perspectives concerning their view of radiation in general and or what irradiation (exposure) to plants, game and minerals exposure means to them. For example, many indigenous cultures believe the concept of irradiation includes the release of "angry powers" that can only be satisfied by a return of the power to its original release point. In addition, indigenous cultures also believe that they can neither eat game, plants nor use minerals in areas exposed to these powers, therefore making it impossible to perform religious, cultural or gathering activities in the areas of exposure. Additional studies concerning indigenous peoples perceptions concerning radiation are required to be conducted to acquire the complete perspective concerning occupational health and safety impacts.

Response

Section 4.1.7.2.6 of the Repository SEIS points out that preclosure radiation dose to the maximally exposed member of the public as a result of the proposed project would be small, with 99.8 percent of the dose attributable to exposure to naturally occurring inert radon-222 gas and its short-lived decay products in air. Accumulation of radioactive contamination on the ground or vegetation would be extremely small, if any.

In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the FEIS, DOE committed to continue the Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. The FEIS reported that construction activities would have no direct impacts on several delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. However, because of the general level of importance that American Indians attribute to these places, which they believe are parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. Based on tribal update meetings for members of the Consolidated Group of Tribes and Organizations held since the completion of the FEIS, the American Indian viewpoint is unchanged (see Repository SEIS section 4.1.5.1.2, American Indian Viewpoint).

1.7.8 (1690)

Comment - RRR000836 / 0010

If new, increased health risks from radiation exposure or residual radiation exposure are found during the life of the repository and rail line, by what process will shipment and storage policies be amended?

Response

Repository operations would be conducted pursuant to the regulatory authority of the NRC. DOE would assess as necessary any change in its policies on transportation of radioactive materials to the Yucca Mountain Repository.

1.7.8 (1757)

Comment - RRR000657 / 0044

Comment: Sections 10.1.2.1.1 and 10.1.2.1.2, page 10-6: These sections discuss radiation dose to workers who load transportation casks and to the public from incident free transportation.

Resolution: These discussions should acknowledge conservative inputs such as the assumption of the regulatory limit radiation doses at 2 meters from the transportation casks. It should also be acknowledged that the resulting consequences would be lower than the estimates presented.

Response

Section 6.2 of the Repository SEIS describes the analysis for loading impacts.

1.7.8 (1796)

Comment - RRR000622 / 0010

On page 31 of the SEIS summary radiation doses are discussed saying: "The highest annual dose would be 6.8 millirems, less than 4 percent of the annual average 200-millirem dose to members of the public from ambient levels of radon-222 and its decay products." This is misleading. Doses from Yucca Mountain or casks on the way to the site are in addition to background or ambient levels of radiation. To receive the same dose at a doctor's office, a person must sign a consent form.

Response

DOE agrees that the potential exposure would be in addition to exposure from background radiation. DOE provided the comparison to background radiation to provide perspective.

1.7.8 (1810)

Comment - RRR000620 / 0004

It is particularly notable that, as discussed in Section 4.1.7.2.6, page 4-65, about 99.9 percent of radiation related preclosure health impacts would be from exposure to naturally occurring radon and its decay products. A point of comparison should be made to other ongoing activities that cause radon exposure such as mining operations throughout the State of Nevada and how much radon radiation dose is caused by such ongoing operations for the same period as repository construction. Such a comparison would provide valuable information to demonstrate the low and routine nature of these impacts.

The postclosure impacts described in the DSEIS were also shown to be small, with mean radiation doses over the first 10,000 years projected to be less than 0.24 millirem per year to "reasonably maximally exposed" residents who may be located 18 kilometers from the repository and radiation doses over the entire 1 million year period evaluated less than 2.3 millirem per year at the same point. These peak doses are far below regulatory limits proposed by the Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) and represent less than a 1 percent increase in the annual radiation exposure to any person living in the vicinity of Yucca Mountain.

In determining these results, DOE is to be commended for incorporating a number of analytical improvements in its postclosure TSPA—four examples of which are listed below.

Section 5.1.1. DOE should be commended for incorporating analytical improvements identified in the proposed revision to EPA's Yucca Mountain radiation protection standard into this DSEIS. Specifically, the improved approach to modeling long-term climate change and the use of revised International Commission on Radiation Protection weighting factors for calculation of individual doses provide a much more credible, transparent and reasonable evaluation of the potential radiological impacts of the repository beyond 10,000 years. In the latter case, the application of more up-to-date biosphere dose conversion factors for neptunium (Np) is particularly significant and is more consistent with independent performance assessments such as that performed by the Electric Power Research Institute (EPRI).

Table 5-1, pages 5-7 and 8. DOE should be commended for updating its performance assessment models in several areas to provide more realistic results. For example, the in-drift chemistry modeling that constrains in situ water chemistry and the inclusion of thermal dependency in general corrosion rates are more realistic than previous model inputs.

Section 5.1.2, page 5-10 regarding chemical toxicity of repository releases is improved over the FEIS analysis by using more reasonable inputs regarding the oxidation state chemistry and aqueous speciation of dissolved chromium. DOE is commended for removing unreasonable conservatism from previous analyses.

Section F.4.1.2.1 describes the role that radionuclide solubility plays in the contribution that each radionuclide makes to long-term postclosure radiological impacts. Our review of reference materials for DOE's performance assessment indicates that in the TSPA prepared for this DSEIS, DOE has revised its Np solubility parameters to provide a more realistic assessment of Np mobility in the subsurface. DOE is to be commended for doing this as it eliminates excessive conservatism in the analysis and establishes improved consistency between DOE's performance assessment and independent performance assessments such as that conducted by the Electric Power Research Institute (EPRI).

While these improvements provide for a much more realistic assessment of the likely future performance of Yucca Mountain, we still believe that DOE's analysis is highly conservative. In Comment IV we have identified a number of conservatisms that DOE should further address as it proceeds with the design and licensing of the repository.

Response

Comment noted. DOE has addressed concerns about conservative assumptions in other comment responses.

1.7.8 (1814)

Comment - RRR000657 / 0034

Comment: Section 6.3.1, page 6-12: This section discusses methods to estimate transportation impacts. One of the assumptions is that the radiation levels emitted from transportation casks would be at the regulatory limit of 10 millirem per hour at a distance of 2 meters for every transportation cask.

Resolution: This assumption should be recognized as very conservative. Either replace it with an estimate using statistical average radiation limits from previous shipments or at least include the more realistic estimate as a point of reference. The use of grossly conservative input assumptions should be

avoided to the extent practical because overestimates of consequences provide misinformation to the public and decision makers.

Response

As noted by the commenter, the radiological impact analysis for spent nuclear fuel and high-level radioactive waste transportation assumed that the external radiation levels emitted from each transportation cask would be at the regulatory limit of 10 millirem per hour at a distance of 2 meters (6.6 feet). This assumption would tend to overestimate radiation dose to workers and the public because not all casks would be loaded with spent nuclear fuel or high-level radioactive waste with characteristics that resulted in the cask external dose rate being at the regulatory limit. The Electric Power Research Institute report "Assessment of Incident Free Transport Risk for Transport of Spent Nuclear Fuel to Yucca Mountain Using RADTRAN 5.5," noted that more than 40 percent of the shipped spent nuclear fuel would probably have cooled for more than 20 years and would be less radioactive (DIRS 185330-EPRI 2005, all). Therefore, external dose rates for most casks shipped would be lower than the regulatory limit.

Incident-free dose would be directly proportional to the cask external dose rate; therefore, if the external dose rate was 30 percent lower than the regulatory limit, the estimated incident-free dose would be 30 percent lower than that estimated assuming the regulatory limit for each cask. Appendix J. Section J.1.2.3.4 of the Yucca Mountain FEIS discussed this issue. The FEIS analysis estimated that the dose rate would be 50 to 70 percent of the regulatory limit. As a result, radiological risks to workers and the public from incident-free transportation are likely to be no more than 50 to 70 percent of the values estimated using the regulatory dose rate.

1.7.8 (1816)

Comment - RRR000657 / 0033

Comment: Section 6.2.3, page 6-9, Table 6-2: This section states that the maximally exposed individual repository worker would receive 25 rem based on an assumption that he would receive an annual administrative limit of 500 millirem per year for a 50-year working life. Even though page 6-10 recognizes this is "unlikely," such grossly conservative assumptions serve no useful purpose and should be avoided.

Resolution: Instead of making the assumption that the same person would receive the maximum allowed dose for 50 consecutive years, only the maximum annual results should be presented. Use of administrative controls to reduce the actual worker dose should also be acknowledged.

Response

The sections in which DOE presents the analyses address the conservative nature of these analyses. For transportation impacts, Chapter 6 of the Repository SEIS presents this analysis.

1.7.8 (1887)

Comment - RRR000479 / 0004

Shipment would cause cumulative routine radiation exposures to the public. Approximately 50 million people in 44 states would live within the potential exposure zone.

Response

Sections 6.2 and 6.3 of the Repository SEIS discuss national impacts from loading (Section 6.2.2) and transporting (Section 6.3.2) spent nuclear fuel and high-level radioactive waste to the proposed repository.

1.7.8 (1899)

Comment - RRR000525 / 0014

Radiological risk representation seems to be one of those specialized areas of science and public health in which technical specialists in the field have developed and use measures that are undoubtedly suitable for their use, but which do not translate well to the general public. Section S.3.1.7.2 has a discussion on updated latent cancer fatality conversion factors and indicates that DOE has used the conversion factor of 0.0006 latent cancer fatality per person-rem. In the text (Page 4-60) that is repeated and the reader is given several references to "DOE guidance" but no translation of what a person-rem is.

Response

Appendix D, Section D.1.3 of the SEIS describes person-rem, which is a unit for population dose. The radiation dose to an individual or to a group of people is expressed as the total received dose or as a dose rate, which is dose per unit time (for example, a year). Population dose is the total dose to an exposed population; person-rem is the unit. Population dose (or collective dose) is the sum of the individual dose to each member of a population. For example, if 100 workers each received 0.1 rem, the population dose would be 10 person-rem.

1.7.8 (1905)

Comment - RRR000677 / 0014

DOE will be conducting subsurface excavation activities for the underground repository while it is operating the surface facilities at the geologic operation area (GROA). DOE will use high explosives, stored on-site, for tunnel blasting and road construction. SEIS at 2-22, 2-40, 4-17 and 4-115. Consequently, GROA operations may include storage, handling and repackaging of SNF [spent nuclear fuel] and HLNW [high-level nuclear waste] in proximity to the use and storage of high explosives.

The SEIS should contain an analysis of the risks of storing and handling explosives when spent nuclear fuel and high-level radioactive waste are onsite. It should also address whether the use of underground explosives impact the active faults in the area.

Response

The industrial safety incident rates DOE used for the Repository SEIS discussion of nonradiological occupational and public health and safety include incidents that involve mining activities, which commonly involve the use of explosives. Therefore, the use of explosives in an industrial environment has been addressed by the method used to estimate industrial safety impacts. Waste handling operations would occur in buildings behind 4- to 5-foot-thick reinforced concrete walls that would resist any missile or shock wave from unintentional detonation of onsite explosives. As indicated in Appendix E, Section E.2.1.2.1 of the SEIS, these walls would be sufficient to resist the impact of a military jet aircraft. Waste that moved in the geologic repository operations area would be in transportation casks or TAD canisters. These containers would resist the impact of onsite explosions. Appendix E discusses the drop and breach of these containers. DOE would excavate the repository by mechanical means that would not affect the faults. For excavation using explosives, controlled blasting techniques designed to limit damage to the rock would ensure that the potential for impacting faults would be very low.

1.7.8 (1923)

Comment - RRR000861 / 0006

Physicians for Social Responsibility would like to bring to the attention of DOE, and to the public, that recent research on the effects of ionizing radiation prove that very small doses of radiation from the transport of this waste could lead to fatal cancers that once were thought to result only from high level doses of radiation. Ionizing radiation in high-level doses (exposure to over 1 Sievert) produce immediate damage like skin burns, hair loss, and bone marrow destruction. Low doses (exposures under .1 Sievert or 40 times the average yearly background exposure) are less predictable, the effects are not immediately visible, and involve the cancerous transformation of cells. Seven reports since 1956 have been published by the National Research Council's Committee on Biological Effects of Ionizing Radiation (BEIR). The reports address the potential health effects from exposure to low doses of radiation. Since 1990, the committee has supported the "linear no-threshold model" hypothesis. This hypothesis states that all exposure to radiation, no matter how small the dose, presents some risk to human health. The most recent committee report (BEIR VII) calculated the expected cancer risk from a singular exposure of 0.1 Sievert. The committee found that in a lifetime approximately 42 out of 100 people will be diagnosed with cancer and one cancer out of these 100 people could result from a single exposure to 0.1 Sievert of low-level radiation above background. There is still a lack of scientific certainty over what level of radiation exposure leads to cancer, mostly due to the difficulty in proving a [causal] link between a specific radiation exposure and adverse health effects, however the likely risk is sufficient reason to prevent the Yucca Mountain policy from moving forward, since it will likely expose workers and hundreds of U.S. communities to low-levels of radiation.

Response

The Repository SEIS describes the potential impacts of the Proposed Action. DOE has described those impacts throughout the document and provided information on which an informed decision can be made. The Department conducts all activities in accordance with applicable regulations and best management practices, including as-low-as-reasonably-achievable radiation protection practices. Where appropriate, DOE has identified mitigation measures, including administrative controls, to provide further protection to members of the public and workers. The health and safety impacts presented in the Repository SEIS are based on the linear no-threshold model hypothesis.

1.7.8 (1948)

Comment - RRR000861 / 0004

Physicians for Social Responsibility is extremely concerned with the grave danger that the Yucca Mountain repository plan poses to human life and health in the United States. For example, look at the transportation plan for this radioactive waste. If the current stock of commercially generated nuclear waste is shipped by truck to a repository like Yucca Mountain, one shipment every four hours, 24-hours a day for 38 years would cross the United States through 43 states. DOE prepared a Draft Supplemental Environmental Impact Statement for Yucca Mountain in October 2007. In the Statement, DOE estimates that, if there were no major accidents, 5 people (one member of the public and four transportation workers) would die of cancer from the transport of this radioactive waste within 50 years. However, DOE assures us that, "this number of fatalities, which would occur over as many as 50 years, would not be discernable from the 600,000 people who die from cancer every year in the United States."

I assure you that every lost life is discernable and matters. A policy that allows for loss of life is not ethical.

Response

The purpose of the Repository SEIS is to describe potential impacts of the proposed project. DOE describes those impacts throughout the document to provide information from which it can make an informed decision. The Department takes the protection of the public and worker health and safety very seriously and conducts all activities in accordance with applicable regulations and best management practices, including as-low-as-reasonably-achievable radiation protection practices. The SEIS discusses mitigation measures, including administrative controls, to provide further protection to members of the public and workers.

1.7.8 (2131)

Comment - RRR000657 / 0020

Comment: Section 4.1.7.2.6, page 4-65 and Section 8.3.2, page 8-27: About 99.9 percent of preclosure health impacts would be from exposure to naturally occurring radon and its decay products, according to this section. Without real life comparisons, it is difficult for the public and decision makers to be informed.

Resolution: A point of comparison should be made to other ongoing activities that are readily accepted in Nevada that also release naturally-occurring radon. For instance, comparison of radon releases from a Nevada mining operation would be informative.

Response

Radon releases from Nevada mining operations have not been studied extensively. However, there have been extensive studies of background radon concentrations in homes of Nevada including those concentrations contributed by the mining operations if any. The use of natural background radiation is considered to be a valid measure for providing perspective for the estimated doses. The potential radiation doses resulting from the proposed action and the naturally occurring background radiation in the YMP area were compared to illustrate the relative level of radiation doses.

1.7.8 (2146)

Comment - RRR000657 / 0019

Comment: Section 4.1.7, page 4-59: A text box that describes conservative assumptions used in the Draft Repository SElS radiological impact analysis is shown in this section. Assumptions are the following: Workers would work 50 years in the same job handling used nuclear fuel; All fuel would be at the radioactive design basis limit; No radiation protection administrative limits would be applied; and the most exposed member of the public would stand at the site boundary for 70 consecutive years. These assumptions are grossly conservative.

Resolution: Results should be presented using more reasonable assumptions; otherwise, the public and decision makers are being misinformed which could result in overestimates of radiological consequences and poor decision-making. Such conservative analyses also complicate [Nye] County's risk-communication efforts.

Response

The sections in which DOE discusses the analyses address the conservative nature of these analyses. The SEIS provides a cautious but reasonable evaluation of the impacts of the Proposed Action. The evaluation models and assumptions in the SEIS are appropriate for the purpose of providing a basis for

performing compliance and impact evaluation. In the SEIS, there is no instance where conservatism is of significant importance with respect to the final results and conclusions of the SEIS.

1.7.8 (2321)

Comment - RRR000836 / 0011

You have not provided baseline health data, including cause of death analysis, for the communities surrounding the affected area, for the purpose of future comparison. Are such health analyses being planned by any agency in order to monitor changes in health related to exposure? Without these studies, illnesses and changes in health will not be able to be linked to the proposed actions.

Response

During the preclosure period of the repository, environmental monitoring program and radiation/radiological monitoring system (DIRS 173623 BSC-2005, all) would be designed and implemented to ensure worker and public doses below regulatory limits and ALARA. Radiation levels such as gamma and neutron in surface and subsurface process areas and airborne radioactivity in effluents from various exhaust systems would be monitored over the duration of the repository. Radiation worker doses would be monitored and recorded.

1.7.8 (2604)

Comment - RRR000241 / 0007

The commenter stated that DOE should base the analysis of human health on "Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2" (DIRS 181250-National Research Council 2006).

Response

As indicated in D.1.7, the health effect conversion factor of 0.0006 used in the SEIS is consistent with the conversion factors from the National Research Council in Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2 (DIRS 181250-National Research Council 2006, p. 15), which range from 0.00041 to 0.00061 latent cancer fatality per person-rem for solid cancers and 0.00005 to 0.00007 latent cancer fatality per person-rem for leukemia.

1.7.8 (2892)

Comment - RRR000688 / 0030

The commenter stated the need for more study of cristobalite.

Response

Cristobalite is a naturally occurring form of silica (silica dioxide) that occurs in Yucca Mountain tuffs; the common mineral quartz is a naturally occurring form of silica. Cristobalite is principally a concern for workers who could inhale the particles as dust during subsurface excavation operations. Prolonged high exposure to crystalline silica dust might cause silicosis, a disease characterized by scarring of the lung tissue. Section 4.1.2.1 and Appendix B of the Repository SEIS discuss the characteristics of and problems from cristobalite. They describe, respectively, its maximum concentrations in the air and its associated percent of the benchmark limit for air quality impacts and occupational and public health and safety impacts.

1.7.8 (2893)

Comment - RRR000688 / 0029

The commenter questioned the statements on safety analysis when the repository lacks a TAD design, a pad design, soil testing for the pad, long-term testing of actual spent nuclear fuel in a "real" waste package, and an emergency plan.

Response

DOE has developed and documented the design criteria for TAD canisters and the repository components including the Aging Facility in "Project Design Criteria Document" (DIRS 179641-BSC 2007, all). DOE would use the design criteria in this document to ensure safe operation of the repository. DOE has also developed a "Performance Confirmation Plan" (DIRS 172452-BSC 2004, all) for testing and monitoring repository components including waste package to ensure meeting their design criteria. Soil properties of the repository area have been documented in a Soil Report (DIRS 184595-BSC 2007, all).

DOE would develop an emergency plan, consistent with 10 CFR 72.32(b), and would provide the plan to the NRC no later than 6 months prior to the submittal of the updated application for a license to receive and possess spent nuclear fuel and high-level radioactive waste. The criteria established by 10 CFR 72.32(b) include specific requirements related to the notification and response associated with various potential accidents and incidents.

1.7.8 (2945)

Comment - RRR000688 / 0014

The commenter wants to know what the plan is if the placement of fans does not work over time. The commenter wants to know what the actual "emergency plan" is.

Response

Plans call for fans to be placed in a dual-fan configuration at the ventilation shafts to maintain continuous operation in the event that one fan has to be turned off for maintenance or replacement. DOE will maintain the fans, as required, during active ventilation. DOE would maintain the subsurface ventilation system routinely over the project duration from construction to closure. DOE would develop an emergency plan, consistent with 10 CFR 72.32(b), and provide the plan to the NRC no later than 6 months prior to the submittal of the updated application for a license to receive and possess spent nuclear fuel and high-level radioactive waste. The criteria established by 10 CFR 72.32(b) include specific requirements related to the notification and response associated with various potential accidents.

1.7.8 (2951)

Comment - RRR000688 / 0007

The commenter stated a concern about TAD canister integrity when it has yet to be produced.

Response

DOE developed TAD canister design criteria, which are described in Project Design Criteria Document (DIRS 179641-BSC 2007, all). The Department would use these criteria to ensure the safe operation of the repository.

1.7.8 (3041)

Comment - RRR000681 / 0045

Another example is where the DOE discusses: "The data source [for non-radiological impacts to workers] is the DOE Computerized Accident/Incident Reporting System (CAIRS). A compilation of data from DOE and DOE contractor operations, CAIRS contains annual numbers of total recordable cases and lost workday cases and the incidence rates per 100 full-time equivalent worker years (DSEIS Summary, pg. 9)." No justification for the applicability to Yucca Mountain operations is provided.

Response

Appendix F of the Yucca Mountain FEIS discusses the applicability of the CAIRS database DOE used to represent repository activities.

1.7.8 (3043)

Comment - RRR000681 / 0047

The section on Radiological Impacts gives two reasons for modifying the FEIS analyses and both lead to an increase in radiological consequences. It is strange then that some of the results in the Rail SEIS go down (DSEIS Section 3.1.7.2 and DSEIS Summary, pg. S-30).

Doses are provided without a calculational basis (DSEIS Summary, pg. S-31). Scenarios are described with no basis for their selection provided (DSEIS Summary, pg. S-32).

The calculational or theoretical or judgmental bases for the conclusions of this section are not provided for section S.3.2.2.1 Human Intrusion (DSEIS Summary, pg. S-40).

Response

The estimated mean annual radiation dose presented in the Draft SEIS represents the potential radiological impact from the enhanced repository design for LA and therefore the dose result is different from the FEIS, which was based on the preliminary design information. The basis of dose calculation is provided in Appendix D of the SEIS. Accident scenarios are described in Appendix E and the basis for human intrusion is described in Chapter 5, Section 5.8.

1.7.8 (3126)

Comment - RRR000524 / 0029

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

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

Response

Tables 7-1 and 7-2 of the Repository SEIS summarize estimated impacts that DOE identified in the Yucca Mountain FEIS. Chapter 7 of the FEIS contains detailed discussion and support for the estimates.

Regarding the change between the FEIS and the SEIS in radiological health impacts to the public during the 10,000-year period, Section 7.1.1 of the Repository SEIS explains that DOE used International Commission on Radiological Protection inhalation and ingestion dose coefficients from the "Database of Dose Coefficients: Workers and Members of the Public," and groundshine and immersion dose coefficients from Federal Guidance Report 13 to estimate radiation doses. Some dose coefficients increased and some decreased. For the radionuclides that would contribute the most to long-term dose in the No-Action Alternative, the coefficients decreased, resulting in an overall decrease in estimated long-term radiological consequences.

1.7.8 (3200)

Comment - RRR000121 / 0020

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Impacts to access of land outside of reservation boundaries which are secured to under the 1863 Treaty of Ruby Valley that may be damaged or otherwise removed from use by tribal members by radioactive contamination;

Damage to resources used by tribal members such as wood, grasses, pinion nuts, plant for food and medicinal uses by radiation exposure;

Adverse health effects from exposure to radiation through exposure pathways unique to Native Americans lifestyle.

Response

Section 4.1.7.2.6 of the Repository SEIS states that radiation doses to the most exposed individual as a result of the proposed project would be a small fraction of the dose from naturally occurring background radiation, with 99.9 percent of the dose from exposure to naturally occurring radon-222 and its short lived decay products in air. Radioactive contamination from these nuclides would be very small because there are short lived.

The Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them land rights to approximately one-third of the State of Nevada (including the Yucca Mountain region), along with portions of California, Utah, and Idaho. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury. DOE is aware that in the American Indian community there is significant disagreement with the Court rulings.

Potential doses to life forms other than persons in the vicinity of the project site would be a very small fraction of that from exposure to natural background radiation. There is no evidence that other living organisms are more susceptible to injury from radiation than are humans.

The Yucca Mountain FEIS (Section 4.1.13.2) evaluated potential exposure pathways unique to American Indians such as those mentioned by the commenter and found no additional impacts.

1.7.8 (3543)

Comment - RRR000929 / 0010

The commenter stated that the analysis of human health should be based on BEIR 7 (Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2, National Research Council 2006).

Response

As indicated in Appendix D, Section D.1.7 of the Repository SEIS, the health effect conversion factor of 0.0006 that DOE used in the SEIS is consistent with the conversion factors from the BEIR VII report (DIRS 181250-National Research Council 2006, p. 15), which range from 0.00041 to 0.00061 latent cancer fatality per person-rem for solid cancers and 0.00005 to 0.00007 latent cancer fatality per person-rem for leukemia.

1.7.8 (3602)

Comment - RRR000142 / 0002

The EISs leave many concerns unaddressed. The lack of emergency planning along the transportation routes.

Response

Appendix H, Section H.6 of the Repository SEIS discusses transportation emergency response, including roles, responsibilities, and federal coordination.

1.7.8 (3609)

Comment - RRR000142 / 0009

The EISs leave many concerns unaddressed. Health impacts short of latent cancer deaths. The EISs estimate the number of people who die but there is no data about the number of people who are sick.

Response

The risk for nonfatal cancers or sickness is about 2 times that of fatal cancers. The Yucca Mountain FEIS and Repository SEIS provide information on nonfatal cancer risks in addition to latent cancer fatalities (see Appendix D, Section D.1.10).

1.7.8 (3680)

Comment - RRR000930 / 0007

The commenter stated that the analysis of human health should be based on BEIR 7 (Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2, National Research Council 2006).

Response

As indicated in D.1.7, the health effect conversion factor of 0.0006 used in the SEIS is consistent with the conversion factors from the National Research Council in Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2 (DIRS 181250-National Research Council 2006, p. 15), which range from 0.00041 to 0.00061 latent cancer fatality per person-rem for solid cancers and 0.00005 to 0.00007 latent cancer fatality per person-rem for leukemia.

1.7.8 (3793)

Comment - RRR000935 / 0005

The commenter stated that the analysis of human health should be based on BEIR 7 (Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2, National Research Council 2006).

Response

As indicated in Appendix D, Section D.1.7 of the Repository SEIS, the health effect conversion factor of 0.0006 that DOE used in the SEIS is consistent with the conversion factors from the BEIR VII report (DIRS 181250-National Research Council 2006, p. 15), which range from 0.00041 to 0.00061 latent cancer fatality per person-rem for solid cancers and 0.00005 to 0.00007 latent cancer fatality per person-rem for leukemia.

1.7.8 (3936)

Comment - RRR000953 / 0001

The commenter stated that DOE based the rationale for centralized geologic disposal of spent nuclear fuel on a premise that the risks associated with transportation and geologic disposal are less than the risks of continued storage at nuclear power plants. He called this rationale fallacious because DOE has not made a comparative risk assessment available to the public. Such a risk comparison would show that continued storage at nuclear power plants results in a lower risk and centralized geologic disposal is not necessary.

Response

The Yucca Mountain FEIS and the Repository SEIS provide the analysis requested by the commenter under the No-Action Alternative, which provides a comparison with the potential impacts of the Proposed Action. Chapter 7 provides the results of continued storage at the 76 sites.

1.7.8 (4097)

Comment - RRR000837 / 0005

The commenter stated that the NEPA analyses do not include adequate consideration of risks from radiological exposures. The commenter referred to the National Academy of Sciences and the Biological Effects of Ionizing Radiation (BEIR) VII study, and suggested that to "more honestly assess the likely risks from exposures—even low ones—to vulnerable populations DOE should stop using models based on 'Standard or Reference Man' and instead base estimates on 'Standard or Reference Pregnant Woman.'"

Response

The EPA regulation requires that DOE use data from a survey of local inhabitants and lifestyles to develop the characteristics of the reasonably maximally exposed individual (RMEI). The RMEI represents those few individuals most at risk from the repository, and provides the basis for calculation of exposure. At present, there is no complete set of dose conversion factors acceptable to the scientific community other than Standard Man. DOE used the dose conversion factors developed based on Standard Man in determining the dose to the Reasonably Maximally Exposed Individual (RMEI) and the conformance with the radiation protection guidance and standards issued by federal regulatory agencies. The conversion to health effects using standards set by the International Council on Radiation Protection account for details regarding specific sensitivities of various members of the population. This conversion is consistent with EPA and BEIR VII study (see Appendix D, Sections D.1.6 through D.1.11) and is a

conservative one. However, note that the estimated impacts of postclosure performance even for the 95th percentile (only 5 percent of the doses would be higher) indicate the probability of an individual health effect of less than 1 in 100,000. Therefore any small differences for specific sensitive individuals would amount to small changes in an already very small number.

1.7.9 Noise and Vibration

1.7.9 (2685)

Comment - RRR000688 / 0070

The commenter is concerned that vibration from construction and emplacement activities could cause rockfall and cause emplaced waste packages to fail.

Response

Before emplacing waste packages, DOE would install ground support to provide tunnel stability and prevent rockfall. Ground support for emplacement drifts would consist of friction rock bolts and perforated metal sheets, described in Section 2.1.2.2 of the Repository SEIS. Section 2.1.2.2.1 of the SEIS describes the construction of the emplacement panels. DOE would excavate the emplacement panels in rock formations it selected because of their attributes for waste containment and isolation. The excavations dedicated to waste emplacement would (1) support waste emplacement and retrieval equipment, (2) contain a stable invert structure capable of holding the waste packages on their emplacement pallets and drip shields in stable positions, and (3) provide ground support systems capable of maintaining the safety and integrity of the excavations throughout the preclosure period. DOE would use three emplacement drifts for initial emplacement while development of the remaining drifts in the panel continued concurrently with that operation. The Department would construct isolation barriers to separate the initial emplacement area from the continuing construction. The waste handling structures and equipment would withstand the effects of ground motion from earthquakes and other events. Section 2.1.2.2.3 of the SEIS describes the engineered barriers that would contribute to waste containment and isolation. Engineered barriers would include the waste package, emplacement pallet, emplacement drift invert, and drip shield.

1.7.10 Aesthetics

1.7.10 (1618)

Comment - RRR000690 / 0011

The SEIS concludes that the environmental impacts upon study area aesthetic resources would be small. Specifically, the document indicates that a potential impact would exist if lighting is required to be installed at the top of YMP [Yucca Mountain Project] ventilation stacks. Indigenous persons believe it is important that their view of the YMP study area be unobstructed without the distraction of buildings, roads and other impediments to the spiritual interaction between the people and their lands. Therefore, any and all proposed modifications to the YMP area should include indigenous persons and or representatives, to assist with the design and construction of YMP facilities. Such representation will provide an opportunity for indigenous persons to voice their concerns and design YMP facilities that are the least intrusive to the surrounding landscape. Finally, the Tribe is opposed to the addition of any lighting scheme to YMP ventilation towers.

Response

DOE plans to continue the Yucca Mountain Project Native American Interaction Program throughout implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. Section 4.1.10.2 of the Repository SEIS discusses the fact that the presence of exhaust ventilation stacks on the crest of Yucca Mountain would be seen as an adverse aesthetic impact by American Indians. DOE would minimize the application of lighting on the visible facilities to that required for safety compliance.

1.7.11 Utilities, Energy, and Materials

1.7.11 (1450)

Comment - RRR000867 / 0006

All trucks should use biodiesel fuel, not from genetically modified crops, but from Las Vegas' over 130 restaurants and those along the transportation routes.

Response

The White House issued Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," on January 24, 2007, to require federal agencies to reduce greenhouse gases through a reduction in energy intensity, including the use of renewable energy. As technologies continue to evolve, DOE will continue to evaluate its options for different types of fuels as part of its efforts to decrease possible greenhouse gas emissions.

1.7.11 (1452)

Comment - RRR000867 / 0008

Do not import nickel and titanium. Get them domestically. I am opposed to mining—but keep it in America so we can see and deal with the damage we are causing to the environment instead of having another country deal with the problems left behind.

Response

Section 4.1.14.5.4 of the Repository SEIS discusses nickel and titanium availability in the "Impacts from Manufacturing Repository Components" section. As described in that section, the United States currently imports about 60 percent of the nickel and about 72 percent of the titanium that it uses. Because both nickel and titanium are world-wide commodities, DOE will by necessity obtain the nickel and titanium from where it is available on the world market.

1.7.11 (1609)

Comment - RRR000690 / 0017

The SEIS indicates that quantities of utilities, energy and materials used in support of repository construction activities will be small in comparison to regional supply capacity. The SEIS should include information concerning any potential impact to Native American use of utilities, energy and materials, i.e. whether prices or the availability of utilities, energy and materials will be impacted on or near reservation lands.

Response

Chapter 4, Section 4.1.11.1, of the Repository SEIS describes impacts to utilities, energy, and materials and concludes that the repository requirements would be a small percentage of existing regional demands. For this reason, the repository should not affect the prices and availability of utilities and energy to American Indians.

Repository facilities would not use water utilities or residential sewer, the maximum demand for electricity during operations would be about 1.2 percent of the projected peak demand of the power supply company for 2021 (based on peak demand projections made in 2007), and the maximum annual fuel use of diesel fuel and gasoline would be about 1.1 percent and 0.021 percent, respectively, of Nevada fuel use during 2004. In addition, the use of materials necessary for construction of the repository should not affect prices or availability of those materials. DOE based this conclusion on a comparison of the small percentage of repository requirements with existing regional and national demands. The average yearly concrete demand for the construction period would be less than 1 percent of the concrete used in Nevada in 2004. Because the markets for carbon steel and copper are worldwide, a national comparison for the use of these materials is appropriate. The total use of carbon steel at the repository would be less than 0.3 percent of the annual domestic production capability, and the total use of copper would be less than 0.07 percent of the annual domestic mine production.

1.7.11 (1873)

Comment - RRR000677 / 0018

DOE estimates construction of the Yucca Mountain repository would require 320,000 cubic meters of concrete and 130,000 metric tons of cement. SEIS at 4-85. DOE claims the concrete demand is less than one percent of that used in Nevada. DOE also says: "Cement would be purchased through regional markets and shipped to the site." SEIS at 4-85. Again, DOE presumes that the regional cement suppliers would have the ability to meet demand.

Response

The Repository SEIS does not attempt to identify specific resources that are necessary to meet the existing state demand for concrete and cement. The SEIS compares the repository concrete and cement requirements with existing demands in Nevada to determine the impact additional repository usage would have on existing statewide demands. The repository requirements would be a small percentage of Nevada's existing concrete and cement demands; therefore, the repository's impact on those demands should be small. Although demand for cement has briefly exceeded supplies during past construction booms in the Las Vegas region, the current supply of cement and concrete is sufficient to meet demands. For example, a single construction project in Las Vegas in 2008 will use more than 470,000 cubic meters of concrete over a 3-year period. A single company, Nevada Ready Mix, states that this is well within the scope of its capabilities. This compares with the repository's requirement of 320,000 cubic meters of concrete over a 5-year period.

1.7.11 (1903)

Comment - RRR000677 / 0016

"Energy is a critical component in sustaining Utah's vibrant economic growth and preserving our unparalleled quality of life," said Utah Governor, Jon M. Hunstman, Jr. ... The construction and operation of the repository could use up to 790,000 megawatt-hours of electricity annually. SEIS at 4-84. Yet, the

SEIS fails to discuss impacts on regional areas or neighboring states from energy use at the Yucca Mountain geologic repository.

Nevada Power and Valley Electric, which both supply power to the Nevada Test Site, will provide electrical power to Yucca Mountain. In 2005, Nevada Power purchased 61 percent of its power; Valley Electric also purchased power. SEIS at 3-81,82. The Nevada Public Utilities Commission projects that if Nevada Power does not secure additional generation facilities, it could have a power shortfall of 4,000 megawatts by 2020. Nevada's Electricity Figure: A Portfolio-Focused Approach (2007) at 3. Nevertheless, DOE assumes that Nevada Power and Valley Electric will continue to meet the electrical demands of its customers, including DOE. In addition, the SEIS for the rail corridor notes that the Lincoln County Power District No. 1, which supplies power to Lincoln County residents, "plans to increase long-term supply by buying into the planned coal-fired Intermountain Power Project (IPP) plant in Delta, Utah." SEIS Transp. at 3-313. If DOE plans to purchase power from Lincoln County Power, it should understand that IPP has abandoned its plans to build a third coal-fired power plant unit.

DOE does not explain its basis for assuming customer electrical demands will be met. This raises a number of unanswered questions. For example, do the Integrated Resource Plans for Nevada Power and Valley Electric account for the projected power usage at Yucca Mountain? ... Will these utilities continue to purchase electrical power to meet customer demand? How will the availability of electrical power impact economic development projects in Utah and other neighboring states? What [effect] will the additional electrical demands for the Yucca Mountain repository have on the regional inventory of greenhouse gas emissions?

During construction of Yucca Mountain, DOE estimates annual use of diesel fuel and gasoline at 1.5 million gallons and 47,000 gallons, respectively. SEIS 4-84. The SEIS does not address the volume of carbon emissions from the use of fossil fuel and the potential impacts on Nevada and neighboring states in their attempt to reduce regional greenhouse gas emissions in the next decade and beyond. Nor does it address the impact DOE's fuel usage will have on regional fuel stockpiles or fuel prices.

Response

As stated in Section 4.1.11.1.3 of the Repository SEIS, the repository demand for electricity would be well below the future estimated regional demand for power consumption. In 2005, Nevada Power Company estimated that its summer peak demand would be 7,511 megawatts in 2020 and that its sales that year would exceed 25 million megawatt-hours. Using the 2005 estimates, the maximum electricity demand of the repository in 2020 would be about 1.4 percent of Nevada Power's estimated summer peak demand and about 3.7 percent of Nevada Power's 2020 sales. Nevada Power Company estimates in 2007 increased the estimated peak demand in 2021 to 8,763 megawatts and the estimated yearly demand to 31 million megawatt-hours. Using the 2007 estimates, the maximum electricity demand of the repository in 2021 would be about 1.2 percent of Nevada Power's estimated peak demand and about 3.0 percent of Nevada Power's 2021 demand requirements.

Nevada Power Company has stated that a projected shortfall between demand and available resources could occur after 2011 and that additional resources would be necessary. The Repository SEIS did not attempt to identify these resources. The SEIS compares the estimated repository electricity usage with the projected electricity demands of the region to determine the impact additional repository usage would have on regional demands. Repository requirements would be a small percentage of Nevada Power Company's projected electricity demands; therefore, the repository's impact on those projected demands should be small.

DOE has added a description of greenhouse gas emissions (primarily carbon dioxide) during the repository construction and operations periods to Section 4.1.2.6 of the SEIS. DOE calculated carbon dioxide emissions from the burning of diesel fuel and gasoline during those periods and compared those amounts with existing carbon dioxide emissions from the State of Nevada and the United States. The maximum annual carbon dioxide emissions would occur during full repository operations and would be less than 0.15 percent of the 2004 State of Nevada carbon dioxide emissions.

1.7.11 (2684)

Comment - RRR000688 / 0071

The commenter wants to know how much fossil fuel will be used over time.

Response

Section 4.1.11.1.4 of the Repository SEIS describes the use of fossil fuels at the Yucca Mountain repository. Total fossil fuel use during the construction period would be about 5.0 million gallons. During this period, the estimated maximum annual use of diesel fuel and gasoline would be about 1.5 million and 47,000 gallons, respectively. This consumption would be about 0.3 percent and 0.005 percent of the 2004 Nevada-wide consumption, respectively. Total fuel use during the operations period would be about 180 million gallons. During this period, the maximum annual use of diesel fuel and gasoline would be about 5.3 million and 220,000 gallons, respectively. This consumption would be about 1.1 percent and 0.021 percent of the 2004 Nevada-wide consumption, respectively. The amount of fuel used at the repository would have a small impact on regional fossil fuel consumption, and thus a small impact on regional fossil fuel availability.

1.7.12 Waste Management

1.7.12 (134)

Comment - 2 comments summarized

RCRA Waste

The analysis did not describe how the project would comply with the requirements of the *Resource Conservation and Recovery Act* as it applies to the burial of hazardous metals.

Response

As identified in Section 11.2.4 of the Yucca Mountain FEIS, DOE would not accept hazardous waste for disposal at Yucca Mountain. Before shipping materials to Yucca Mountain, DOE would treat those that contained Resource Conservation and Recovery Act-hazardous components to eliminate the hazardous characteristics. Before shipping materials that contained hazardous components listed under Subpart D of Part 261 or applicable state requirements, DOE would process necessary delisting petitions with the appropriate regulatory authorities.

If the commenter's question is about the packaging in which DOE would manage the spent nuclear fuel and high-level radioactive waste, the metals in the packages would incorporate hazardous constituents (for example, chromium and nickel). However, these packages are not part of the waste and are not inherently waste-like. Further, DOE would select materials of fabrication for the waste packages specifically to be highly durable and resistant to corrosion. Leaching of hazardous constituents from these metals in amounts to qualify as *Resource Conservation and Recovery Act* hazardous waste would not be an issue. In spite of this regulatory classification (or lack thereof), DOE evaluated potential

impacts from the long-term post closure degradation of the waste packages, as described in Appendix F, Section F.5 of the Repository SEIS. The Department concluded that, even using conservative, bounding assumptions, concentrations of toxic materials in the receiving groundwater would never reach levels of concern.

1.7.12 (922)

Comment - RRR000662 / 0013

This Draft SEIS does not describe how DOE plans to comply with requirements of the *Resource Conservation and Recovery Act* as it applies to burial of hazardous metals that can be released to groundwater. The metals would largely be derived from corrosion of the 11,000 waste packages, and their burial is prohibited under current RCRA regulations.

Response

As identified in Section 11.2.4 of the Yucca Mountain FEIS, DOE would not accept hazardous waste for disposal at Yucca Mountain. Before shipping to Yucca Mountain, DOE would treat waste that contained RCRA-hazardous components to eliminate any hazardous waste characteristics. Before shipping waste containing hazardous components listed under Subpart D of Part 261 or applicable state requirements, DOE would process any necessary delisting petitions with the appropriate regulatory authorities. If the commenter's question is in regard to the packaging in which the spent nuclear fuel and high-level radioactive waste would be managed, it is correct that the metals used in the packages incorporate hazardous constituents (for example, chromium and nickel). However, these packages are not part of the waste and are not considered inherently waste-like. Further, materials of fabrication for the waste packages would be specifically selected to be highly durable and resistant to corrosion. Leaching of hazardous constituents from these metals in amounts to qualify as RCRA-hazardous waste would not be an issue. In spite of this regulatory classification (or lack thereof), DOE did evaluate the potential impacts from the long-term, postclosure degradation of the waste packages as described in some detail in Section F.5 of Appendix F to the Repository SEIS. DOE concluded that even using conservative, bounding assumptions that concentrations of toxic materials in the receiving groundwater would never reach levels of concern.

1.7.12 (1446)

Comment - RRR000867 / 0002

The draft SEIS states plutonium could be disposed of or used to produce mixed oxide fuel. The plutonium should be recycled into mixed oxide fuel.

Response

DOE would dispose of the plutonium as either spent mixed-oxide fuel or as an immobilized plutonium waste form in a high-level radioactive waste canister. The Repository SEIS considers disposal of both waste forms.

1.7.12 (1447)

Comment - RRR000867 / 0003

The commenter expressed opposition to the creation of a landfill for disposal of nonhazardous waste, suggesting instead the development of reuse or recycling for all wastes generated as part of the Proposed Action.

Response

As noted in Section 9.2.1 and Table 9-1 of the Repository SEIS, DOE has identified many actions as best management practices for the repository. These would include efforts to reduce waste production through recycling, encourage reuse of materials and the use of recycled materials, select low-waste producing processes, and other measures.

1.7.12 (1608)

Comment - RRR000690 / 0018

The SEIS concludes that any YMP [Yucca Mountain Project] hazardous materials and or wastes will be appropriately disposed of in regional and statewide landfills, with little or no impact to existing regional or state waste disposal requirements. However, the SEIS is absent information concerning the indigenous cultural perspective concerning how best to appropriately dispose of hazardous materials and waste. Additional studies, with the assistance of indigenous persons, should be conducted and included within subsequent environmental documents concerning the appropriate means of disposing of hazardous materials and waste. In short, indigenous persons should be included in any assessment and siting of waste disposal in general and the siting of new waste disposal facilities specifically.

Response

DOE would use existing regional or statewide disposal facilities as appropriate for the types of waste repository activities would generate. The Department does not anticipate the need to site and develop new hazardous waste facilities.

1.7.12 (1637)

Comment - RRR000550 / 0013

The nation needs new classifications for radioactive wastes.

Spent canisters used for transportation of high-level radioactive waste should not be classified or stored as low-level radioactive waste. Southern California Edison's radioactive wastes should be not be classified as "low level." Definitions of low-level radioactive waste need to be rewritten to exclude many "below class C" items such as these. Many of us who commented in 2001 raised this issue, and it still has not been addressed.

Response

The commenter's request (reclassification of low-level radioactive waste) is for rulemaking that is beyond the scope of this SEIS. There are three classes of commercial low-level radioactive waste, as defined in 10 CFR 61.55—Class A, Class B, and Class C; Class A has the lowest concentration and Class C has the highest. DOE would characterize the low-level radioactive waste properly and dispose of it to the appropriate disposal facility.

1.7.12 (1751)

Comment - RRR000550 / 0006

The supplemental documents contain references to plans to store low-level radioactive wastes resulting from the repackaging of nuclear waste at Yucca Mountain off-site. How is this possible given that the national low-level radioactive waste sites in South Carolina and Utah are reaching capacity while no new acceptable low-level radioactive storage sites have been approved, prepared or funded?

Response

Section 3.1.12.4 of the Repository SEIS describes the facilities DOE could use to dispose of low-level radioactive waste, which include a DOE low-level waste disposal site, a site in an Agreement State, or an NRC-licensed site. Though Chapters 3 and 4 of the SEIS do not describe existing low-level-waste-disposal capacities for each of the facilities, Section 4.1.12.2 does describe how the impacts to low-level waste facilities would be small because the amount generated would be small, approximately 638 cubic meters annually over the life of the Project, which, for comparison, accounts for only 0.5 percent of the low-level waste disposed of in 2005 at commercial low-level waste facilities nationwide. Although Section 3.1.12.4 identifies potential disposal sites, DOE recognizes that there are current shortfalls in licensed commercial capacity for low-level waste. Additional low-level waste disposal facilities are being developed because the nation will continue to need to dispose of low-level waste from nuclear power plants and industrial and medical wastes. It is reasonable to conclude that disposal capacity will be available.

1.7.12 (1933)

Comment - RRR000677 / 0011

The waste generated from operations at the Yucca Mountain, Nevada, repository is a connected action to the geologic disposal of SNF [spent nuclear fuel] and HLNW [high-level nuclear waste]. As such, it should be (but is not) part of DOE's NEPA analysis for the repository. DOE estimates repository operations will generate 74,000 cubic meters of low-level radioactive waste, including liquid waste. SEIS at 4-88. According to DOE, the low-level waste will be disposed in a "DOE low-level waste disposal site, a site in an Agreement State, or in an NRC-licensed site." SEIS at 2-31. Notably, the State of Nevada is a member of the Rocky Mountain Compact and sends its low-level radioactive waste to the Northwest Compact site at Hanford, Washington. Nowhere in the SEIS does DOE address whether the Compact places constraints on DOE's low-level waste disposal options. DOE should address this issue in the final EIS, as well as evaluate the risks and potential impacts from transporting low-level waste to an appropriate disposal facility. Also, approximately 8,900 cubic meters of hazardous waste will be generated at the repository. SEIS at 4-88. In the final EIS, DOE should similarly account for the risks from transporting hazardous waste to disposal facilities.

Response

Section 3.1.12.4 of the Repository SEIS lists U.S. Ecology, also known as American Ecology, in Richland, Washington, as one of the three existing commercial low-level radioactive waste disposal facilities in the United States. The U.S. Ecology site, which is on the DOE Hanford Nuclear Reservation, disposes of low-level radioactive waste from the Northwest and Rocky Mountain Compact states. Section 3.1.12.4 states that DOE has not committed to a disposal location for low-level radioactive waste. The Compact would not place a constraint on DOE's low-level radioactive waste disposal options because the Department would have the option to dispose of site-generated low-level radioactive waste in a DOE low-level radioactive waste disposal site, a site in an Agreement State, or an NRC-licensed site. The Nation's low-level radioactive waste facilities would have enough capacity to accept low-level radioactive waste from the repository because the amount of low-level radioactive waste would be small, approximately 638 cubic meters annually over the life of the Project, which, for comparison, accounts for only 0.5 percent of the low-level radioactive waste disposed of in 2005 at commercial low-level radioactive waste disposal facilities nationwide.

DOE revised Chapter 6, Section 6.4.2 of the Repository SEIS to include the radiological and nonradiological impacts of shipping projected low-level radioactive waste volumes to the Hanford Site. This potential location is representative of a potential low-level radioactive waste disposal site, which could be a DOE low-level radioactive waste disposal site, a site in an Agreement State, or an NRC-licensed site.

1.7.12 (4010)

Comment - RRR000524 / 0006

LOW-LEVEL WASTE

3. Comment:

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

Basis:

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

Response

Section 3.1.12.4 of the Repository SEIS describes the facilities that DOE could use to dispose of low-level radioactive waste, which include a DOE low-level waste disposal site, a site in an Agreement State, or an NRC-licensed site. Though Chapters 3 and 4 of the SEIS do not describe existing low-level-waste-disposal capacities for each of the facilities, Section 4.1.12.2 does describe how impacts to low-level waste facilities would be small because the amount generated would be small, approximately 638 cubic meters annually over the life of the Project, which, for comparison, accounts for only 0.5 percent of the low-level waste disposed of in 2005 at commercial low-level waste facilities nationwide. Although Section 3.1.12.4 identifies potential disposal sites, DOE recognizes that there are current shortfalls in licensed commercial capacity for low-level waste. Additional low-level waste disposal facilities are being developed because the Nation will continue to need to dispose of low-level waste from nuclear power plants and industrial and medical wastes. It is reasonable to conclude that disposal capacity will be available.

DOE has not yet determined the eligibility of specific waste to go to the identified potential disposal sites. The waste would be eligible for disposal at one or more of the general categories of disposal sites identified above.

DOE has not yet determined the volumes of specific classes of low-level waste the Proposed Action would generated. The Department would characterize the waste properly and dispose of it in accordance with applicable criteria at the appropriate disposal facility.

1.7.13 Environmental Justice

1.7.13 (171)

Comment - 10 comments summarized

Environmental Justice for American Indians

Several commenters stated that the Repository SEIS did not identify or address potential impacts to the Western Shoshone or Paiute peoples. The Western Shoshone and Paiute peoples would never be able to return to hold ceremonies or visit their dead relatives. They would be unable to harvest plant and animal medicines that grow only in these areas and that have kept them healthy in times past. These are serious violations of religious freedom and basic human rights. DOE should revise the text of the SEIS to include this information in addition to an acknowledgement by the DOE Nevada Test Site (NTS) that indicates "disproportionately high and adverse impacts from DOE/NTS activities continue to affect American Indians noted by the CGTO that need to be addressed." The text should adapt this language because the CGTO made the same recommendation to the Yucca Mountain Project and because Yucca Mountain is adjacent to the Nevada Test Site.

Response

DOE performed an environmental justice analysis in accordance with guidance from the Council on Environmental Quality (DIRS 177702-CEQ 1997, all) and consistent with policies established by the Nuclear Regulatory Commission (69 FR 52040, August 24, 2004). The Department acknowledges a difference of opinion on this issue with American Indian tribes and organizations.

DOE understands that the Yucca Mountain site is in the historic ancestral territory of the Western Shoshone and Southern Paiute Tribes and that the Western Shoshone maintain that the Ruby Valley Treaty of 1863 gives them the rights to certain lands, including the Yucca Mountain region. DOE acknowledges that people from many American Indian Tribes have used the area that DOE has proposed for the repository as well as nearby lands; that the lands around the site contain cultural, animal, and plant resources important to the tribes; and that the implementation of the Proposed Action would require continuation of restrictions on access to the repository site environs. In relation to what are "acceptable impacts" to nature, DOE understands that American Indians view the environment in holistic and integrated terms and that the repository program and its components conflict with that view.

Consistency with cultural resource and American Indian-related laws has been an integral component of the Yucca Mountain Project since the early 1980s, and the primary focus of the ongoing Native American Interaction Program. Particularly as a result of its long-term and ongoing interactions with tribal representatives on Yucca Mountain, DOE has been able to identify potential impacts to historic and other cultural resources important to sustaining and preserving American Indian cultures.

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the late 1980s. This program is part of the DOE implementation of the Council on Environmental Quality Guidance on Environmental Justice that agencies should recognize the interrelated cultural, social, occupational, historic, or economic factors that can amplify the natural and physical environmental effects of the proposed agency action. Tribes appoint representatives to sit on a DOE-funded, self-organized committee called the Consolidated Group of Tribes and Organizations. While the Group does not support the use of Yucca Mountain as a repository, it has agreed to remain involved in the process. DOE will continue to support the Group and the Native American Interaction Program. During the preparation of the Yucca Mountain FEIS, DOE interacted with American Indian Tribes on a range of topics to assess

their viewpoints and perspectives. The Department 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), which it used as a reference in preparing the FEIS and the Repository SEIS.

DOE has concluded that construction, operations, monitoring, and closure of the proposed repository would not result in any disproportionately high and adverse impacts to minority or low-income populations. DOE understands that the American Indian perspective is that it would.

1.7.13 (2145)

Comment - RRR000550 / 0002

Shipments of SNF [spent nuclear fuel]/HLW [high-level radioactive waste] would pass through the poorest and least populated portions of San Bernardino County, CA. This would represent an environment injustice for low-income communities and place an unfair burden on the affected community.

Response

DOE analyzed two categories of incident-free impacts: impacts from vehicle emissions and radiological impacts from exposure to radioactive materials during routine transport and under accident scenarios. For routine transport, the Repository SEIS reports the estimated impacts from vehicle emissions to be 1 fatality among members of the public over the course of all projected shipments along the routes to the repository. The risk to any individual would be small. DOE estimated that there would be about 1 (0.7) latent cancer fatality among all members of the public exposed to radiation as a result of all projected shipments. Because this estimate is for the entire population of exposed individuals along the transportation routes over the course of shipments to the repository, the risk to a single individual would be small. Although many people would be exposed nationwide over a long shipping campaign, the air emissions and radiation doses to any exposed individual would be low. DOE has not identified any subsection of the population that would be disproportionately affected by transportation activities under the Proposed Action. For potential impacts from accidents, it is not possible to estimate the location where an accident could occur and, therefore, it would be inappropriate to suggest that potential impacts would affect any particular community.

1.7.13 (4012)

Comment - RRR000524 / 0007

ENVIRONMENTAL JUSTICE

4. Comment:

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

Basis:

NRC’s Policy Statement on environmental justice reads, “Under current NRC staff guidance, a minority or low-income community is identified by comparing the percentage of the minority or low-income population in the impacted area to the percentage of the minority or low-income population in the County

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

Reference:

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

Response

DOE has updated Sections 3.1.13 and 4.1.3 of the Repository SEIS to reflect the current NRC Policy Statement.

1.7.14 Transportation

1.7.14 (4183)

Comment - 4 comments summarized

Salt Lake City to Wabuska

Commenters suggested that DOE examine the entire Mina rail route in more detail than the national transportation route analysis in the Yucca Mountain FEIS. Commenters stated that DOE did not evaluate the Mina route segment from Salt Lake City to Yucca Mountain in terms of the number of shipments, risk analysis, radiation exposure, impacts on existing rail operations, emergency response capabilities, and potential areas for increased accidents and derailments.

Response

DOE evaluated the rail corridor from Salt Lake City to the Hazen Siding to Wabuska and then to Yucca Mountain as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. Appendix G contains maps of transportation routes and state-level transportation impacts, for example, in Utah or Nevada. In addition, Appendix G lists the number of shipments through Utah and Nevada.

1.7.14 (4192)

Comment - 8 comments summarized

No Rail Line

Commenters wanted to know what would happen if DOE did not build the rail line from either Caliente or Mina. Some commenters thought that more truck shipments would be necessary; others thought that DOE would have to use heavy-haul trucks, which would involve an intermodal transfer in Nevada.

Response

If DOE did not select a rail alignment in the Caliente or Mina Corridor, the future course it would pursue to meet its obligations under the *Nuclear Waste Policy Act* is unclear at this time. DOE recognizes that other possibilities could be pursued, including evaluating the other three rail corridors to determine an alignment for the construction and operation of a rail line to transport spent nuclear fuel and high-level radioactive waste to the repository at Yucca Mountain; these possibilities were analyzed in the Yucca

Mountain EIS and in the Nevada Rail Corridor SEIS. Further consideration of these possibilities may require additional NEPA reviews, as appropriate.

1.7.14 (4198)

Comment - 17 comments summarized

Routes, Region of Influence, and Unique Local Conditions

Some commenters stated that the DOE had not designated specific routes into Nevada from neighboring states, or had omitted specific routes, or that the analysis of potential impacts was inadequate. Other commenters stated that the transportation analysis had underestimated impacts in specific locations, such as in Las Vegas, Reno, California, Utah, or Northern Nevada. Other commenters suggested that impacts to people in the radiological region of influence outside Nevada had not been determined. Others stated that DOE should evaluate unique local conditions.

Response

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

Section 6.3 and 6.4 of the Repository SEIS address the potential impacts of transporting spent nuclear fuel and high-level radioactive waste from generator facilities to the proposed repository. This analysis included existing rail lines in Nevada, Utah, California, and the rest of the U.S. Appendix G discusses the methods and data DOE used for these analyses and presents state-level maps of the representative routes and the number of shipments in each state.

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

For incident-free transportation impacts, the radiological region of influence would be 0.5 mile on either side of the railroad or highway. For radiological impacts of transportation accidents or sabotage events, the region of influence would be 50 miles from the railroad or highway. DOE used these regions of influence to estimate transportation impacts throughout the United States.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

1.7.14 (949)

Comment - RRR000663 / 0017

The Draft EISs fail to include a comprehensive assessment of impacts to the Las Vegas metropolitan area and Clark County that result from a Caliente rail line and/or rail-to-truck intermodal operations.

DOE estimates 2,650 truck shipments through the Las Vegas metropolitan area, on Interstate Highway 15, I-215 (the Northern and Western Beltways), and US 95, under the proposed action. If there is no second repository, there would be 5,025 truck shipments. There would be 1-2 truck shipments per week, every week, for 50 years.

DOE estimates 755 rail-cask shipments (about 8 percent of the total), in about 252 trains, through Las Vegas on the Union Pacific mainline, under the proposed action. If there is no second repository, and the same percentage shipments enter NV from CA, there could be about 1,929 rail cask shipments in 647 trains through Las Vegas. The DOE estimate could result in 5-13 trains per year, for 50 years.

State of Nevada estimates up to 4,400 rail-cask shipments (45 percent of the total), in about 1,467 trains, through Las Vegas under the proposed action. If there is no second repository, there could be 10,850 rail cask shipments in 3,617 trains, through Las Vegas - or between 29 and 72 trains per year, or 2 - 6 trains per month, for 50 years.

DOE defines the radiological region of influence for incident-free transport as the area 0.8 km (0.5 mi) on either side of the rail alignments centerline, and for accidents and sabotage the area 80 km (50 mi) on either side. The affected environment for radiological impacts includes individuals and businesses within the regions of influences.

The State of Nevada has applied the radiological regions of influence to the potential DOE shipping routes through Las Vegas and Clark County, based on a half-mile buffer around highways and the UPRR [Union Pacific Railroad] mainline, using the Clark County GIS [geographic information system] Management Office “street centerline” file, and the Bureau of the Census 2005 census tract estimates. The State estimates that at least 113,000 residents of Clark County live within one-half mile of a highway route for truck shipments to Yucca Mountain while at least 95,000 residents of Clark County live within one-half mile of the Union Pacific route for shipments to Yucca Mountain via Caliente.

Based on previous studies, the State of Nevada estimates at least 40,000 nonresident visitors and workers in Clark County would likely be located within one-half mile of the highway and rail routes for shipments to Yucca Mountain at any hour of the day. Virtually all of Clark County’s 2 million residents live within the 50-mile radiological region of influence for transportation accidents and sabotage.

The Union Pacific mainline travels through the Las Vegas metropolitan area for about 36 miles. Most of the largest and best-known Las Vegas hotel-casinos are within a mile-and-a-half of the railroad. From Flamingo Road to Fremont Street, the railroad runs parallel to the world-famous Las Vegas Strip, little more than one-half mile away. Along this segment of the route, several major hotel-casinos are actually less than 400 meters (one-quarter mile) from the railroad, and some hotel-casino parking lots are within 60 meters (200 feet). The Clark County Government Center in downtown Las Vegas is located adjacent to the railroad. Two major public entrances to the county government building are less than 100 meters from the railroad, and the employee parking lot is within 20 meters of the railroad.

If DOE constructs a new rail line from Caliente to Yucca Mountain, tens of thousands of Clark County residents would be affected by the shipments. Moreover, these shipments could continue for a period of four decades or more. The potential for large-scale rail shipments through Las Vegas is a major concern for the State of Nevada, Clark County, and the Cities of Las Vegas and North Las Vegas. In addition to the potential impacts on residents, the proximity of the Union Pacific mainline to the world-famous Las Vegas Strip and to other major commercial properties create truly unique local impact conditions.

The Draft EISs, however, failed to address the full range of potential rail and truck transportation impacts to Las Vegas and Clark County.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.7.14 (971)

Comment - RRR000617 / 0025

Page 6-11, Section 6.3—The comparison of total anticipated truck and rail spent fuel and high-level radioactive waste transport miles with total miles of truck and rail transport in the U.S. is meaningless.

Recommendation: For only those routes likely to be used for shipments of spent nuclear fuel (SNF) and high-level radioactive waste (HLW), the SEIS should include a comparison of total existing truck and rail shipments versus DOE-planned truck and rail shipments.

Response

The comparison of national-level statistics is appropriate given the national character of the shipping campaign that would be necessary to transport spent nuclear fuel and high-level waste from 72 commercial and 4 DOE generator sites throughout the United States to the Yucca Mountain Repository.

1.7.14 (981)

Comment - RRR000662 / 0021

The Draft Rail Alignment EIS defines the radiological region of influence for incident-free transport as the area 0.8 km (0.5 mi) on either side of the rail alignment centerline, and defines the radiological region of influence for accidents and sabotage, the area 80 km (50 mi) on either side of the rail alignment centerline. The affected environment for radiological impacts includes individuals and businesses within these regions of influence. The Draft SEIS fails to apply the radiological region of influence concept to existing railroads and highways in Nevada and other states that would traversed by shipments to Yucca Mountain. More than 100,000 Nevadans live within the 0.5 mile region of influence for routine radiological impacts, and more than 2 million Nevadans live within the 50 mile region of influence for radiological accidents and sabotage. The Draft SEIS does not adequately assess doses to workers and the public from routine operations, and the creation of elevated exposure zones at near-route locations: accident prevention, security, and emergency response planning requirements and costs are not adequately addressed; doses to workers, responders, and public from severe accidents and successful terrorist attack or sabotage are not adequately addressed; economic losses from severe accidents and/or successful terrorist attack or sabotage, and cleanup and recovery costs resulting from release of radioactive materials are not adequately addressed; and stigma and perceived risk impacts are not adequately addressed.

Response

Contrary to the commenter's assertion, for incident-free radiological transportation impacts, the region of influence was 800 meters (0.5 mile) on either side of the railroad or highway, including those transportation routes in the State of Nevada. For the radiological impacts of transportation accidents or sabotage events, the region of influence was 80 kilometers (50 mile) from the railroad or highway. These regions of influence were used throughout the U.S. to estimate transportation impacts.

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by the DOE, NRC, U.S. Department of Transportation, the International Atomic Energy Agency, and others in the international community support the Repository SEIS analytical results.

1.7.14 (1250)

Comment - RRR000745 / 0004

For the draft NV Rail Corridor SEIS and draft Rail alignment EIS, we were greatly disappointed that the DOE did not provide adequate information (even detailed maps) on proposed nuclear waste railway routes in 45 states across the county, nor transfer stations, nor types of transport (including rail, road, waterway or some combination), nor provide opportunities for hearings on these routes from locally affected citizens put at special risks.

Response

Appendix G, Section G.11 of the Repository SEIS contains state-level maps of the transportation routes used in the analysis.

1.7.14 (1253)

Comment - RRR000745 / 0007

We were also disappointed to find little to no information on the past safety records of railway shipment of nuclear waste.

Response

Appendix J, Section J.1.4.2.3.1 of the Yucca Mountain FEIS discusses transportation accidents involving radioactive material. For perspective, for the period from 1971 through 1998, there was only one transportation accident involving a loaded rail shipment of spent nuclear fuel, and this accident did not result in a release of radioactive material from the cask.

1.7.14 (1569)

Comment - RRR000578 / 0002

The transportation system in the draft SEIS does not address transportation safety and security. It underestimates the consequences of severe accidents, as well as human error.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

Appendix G, Section G.9.6 of the Repository SEIS has been updated to provide a more-in-depth discussion of human error.

1.7.14 (1725)

Comment - RRR000682 / 0006

Transportation options for generator sites that will not use rail. DOE increased the estimates of shipments, but did not indicate where they would come from or how they would reach the proposed repository. This situation is a direct result of a decision to construct a rail line.

Response

Table G-8 in Appendix G of the Repository SEIS lists the generator sites that would ship by truck. In addition, Appendix G of the SEIS contains national- and state-level maps of transportation routes.

1.7.14 (1870)

Comment - RRR000677 / 0021

DOE should evaluate public health, safety, and infrastructure impacts along Utah highways and in Utah communities where workers or goods and materials related to rail construction may travel. In particular, DOE must, at least, assess the impacts on Utah State Road-56 to Modena and the surrounding communities.

Response

Section 6.4.2 of the Repository SEIS discusses the impacts of transporting construction materials, repository components, and consumables to the repository. These impacts would include those from commuting workers to the repository and the construction and operation of a rail line. DOE assumed that construction materials for the Caliente rail line would be available in Las Vegas.

1.7.14 (1986)

Comment - RRR000682 / 0021

S-17 The mostly rail alternative requires off-site improvements at or near reactor sites. They should be described in the EIS. The Trojan, Humboldt Bay, Rancho Seco and Diablo Canyon are not directly served by rail. How will these sites transport waste to Yucca Mountain?

Response

For generator sites without direct rail access, heavy-haul trucks could transport rail casks to a nearby rail head. Table G-7 in the Repository SEIS lists these sites. If a generator site could not handle a rail cask, a truck cask would be used. Table G-8 in the SEIS lists these sites. At this time, more than 10 years before shipments could occur, the precise nature of any near-site transportation infrastructure upgrades is uncertain and, therefore, DOE could not include the impacts of such upgrades in the SEIS.

1.7.14 (1997)

Comment - RRR000682 / 0012

The EIS recognizes that more truck shipments will occur yet the EIS did not analyze this increase in truck shipments. DOE needs to discuss the potential access points for shipments not using rail. The overall level of truck shipments appears low given the number of sites that actually have rail service.

Response

In the Yucca Mountain FEIS, DOE analyzed shipping 1,079 truck casks in the Mostly Rail Scenario. In the Repository SEIS, the number of truck shipments increased to 2,650. Chapter 6 in the Repository SEIS analyzes shipping these 2,650 truck casks.

Generator sites that could not ship spent nuclear fuel directly to the repository using rail casks would ship it to the repository in truck casks on overweight or legal-weight trucks. For these shipments, the access point would be a nearby Interstate Highway. A generator site could ship spent nuclear fuel to the repository in rail casks and would use heavy-haul trucks to move the rail casks to a nearby rail head. For these shipments, the access point would be the rail head. Table G-7 in the SEIS lists distances to these rail heads.

1.7.14 (2032)

Comment - RRR000682 / 0005

Alternative UP [Union Pacific] routes avoiding the Reno Sparks area such as the Northern UP Line which enters Nevada at the state line near Herlong (in California) and Flanigan (in Nevada) to Winnemucca ....

Response

The route mentioned by the commenter would increase the distance traveled in Nevada by about 230 miles. In addition, the quality of the track on this route would be lower than the quality of the track that passes through Reno and Sparks. Therefore, DOE did not use this route as a representative route for rail shipments to the Yucca Mountain Repository.

1.7.14 (2074)

Comment - RRR000680 / 0010

The draft EIS fails to adequately identify other shipment possibilities, including the study of viable truck transport routes, and alternative routes through neighboring states. In addition, the EIS does not adequately assess the total number of shipments that may occur from surrounding Western states.

Response

DOE addressed shipments through adjacent western states as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. The Department evaluated impacts of alternative truck routes in the Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3), and has added a summary of this analysis to Appendix A, Section A.6 of the Repository SEIS.

1.7.14 (2164)

Comment - RRR000659 / 0007

DOE did not analyze the effects of transportation accidents on commerce.

Although the NEPA Documents have some generic discussion of possible impacts on public health from rail accidents using computer modeling, there is inadequate analysis of the economic impacts, both long-term and short-term, resulting from an accidental release of radioactive material caused by a long duration fire. Recent tunnel accidents along Interstate 5 near Santa Clarita, California and the Caldecott Tunnel in the San Francisco Bay Area, resulting in long lasting fires, highlight the risk from fires in such contained circumstances. The ability of such a fire and its aftermath to interrupt and interfere with interstate transportation is a major threat to commerce that is not discussed by DOE. Such an accident, with its

attendant risk, or the public perception of risk, could shut some of the busiest rail corridors in California (such as the route over Donner Summit) for substantial periods of time, with a large economic impact. Yet, there is no analysis of the impacts on commerce from such accidents, and the failure to perform this analysis violates NEPA.

Response

Appendix G, Section G.9.4 of the Repository SEIS discusses accidents involving spent nuclear fuel casks in tunnels. Based on analyses performed by the NRC, the consequences of an accident involving a spent nuclear fuel cask in a tunnel fire such as the Baltimore Tunnel fire or the Caldecott Tunnel fire would be very small.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

1.7.14 (2239)

Comment - RRR000607 / 0001

The commenter stated that the EIS should evaluate credible worst-case transportation accidents.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decision making. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

1.7.14 (2282)

Comment - RRR000769 / 0014

The commenter stated that the analysis of transportation of construction equipment and personnel was inadequate because it did not include California.

Response

DOE assumed that construction materials would be available locally in Las Vegas or Reno, so it did not analyze the transport of these materials from California. In addition, DOE assumed that workers would choose to live in the Pahrump or Las Vegas area near the Yucca Mountain Site, rather than commute from California.

1.7.14 (2371)

Comment - RRR000681 / 0028

Significant concern exists over rail operation through Clark County. The existing UPRR [Union Pacific Railroad] main rail line that traverses Clark County already operates at maximum capacity. (Clark County Commodity Flow Study 2007.) There does not appear to have been adequate analysis of existing rail capacity in Clark County in the Draft Rail EIS, nor does there appear to have been an analysis of the current condition of the rail line. This rail line is heavily used, has been in place for over a century, and is located in close proximity to homes, businesses, public facilities, and environmentally sensitive areas, including tribal lands. There is no evidence that DOE coordinated with the UPRR in the development of the Draft Rail EIS.

Response

Based on the shipment estimates in the Repository SEIS, DOE would ship only about 2 additional rail cars through Las Vegas per day. The majority of these shipments would be construction materials, repository components, and consumables such as fuel oil. This increase in the level of traffic through Las Vegas would not result in discernible impacts on the existing rail capacity in Clark County.

1.7.14 (2461)

Comment - RRR000664 / 0035

The proposed Mina rail corridor requires analysis and evaluation of a wide range of new and substantial impacts not heretofore undertaken. Impacts in the Reno-Sparks metropolitan area, surrounding counties, and northeast Nevada have elements that are similar to yet vastly different from those in Nevada's other metropolitan area of Las Vegas and Clark County. Because the proposed Mina corridor will utilize the UP [Union Pacific] east-west mainline that parallels the I-80 corridor, dramatic, new impacts to the region and stakeholder interests in northern Nevada and California will result and require serious study. For example, shipments through Eureka County would be greater for the Mina route than the Caliente route. Impacts of shipments on existing transportation routes should be addressed.

Response

Chapter 6 and Appendix G of the Repository SEIS evaluated the existing rail corridor from Reno and Salt Lake City to the Hazen Siding and then to Yucca Mountain as part of the national transportation analysis. Appendix G of the SEIS contains maps of transportation routes and estimated state-level transportation impacts, such as those in Utah or Nevada. In addition, Appendix G lists the number of shipments through Utah and Nevada.

1.7.14 (2710)

Comment - RRR000664 / 0049

Nevada is at the draining end of the national transportation funnel. The impacts of highway transportation in Nevada have been ignored in this review process. It is reasonably foreseeable that the State of Nevada will ultimately designate highway routes that avoid Clark County. Those routes should be analyzed in these documents.

Response

DOE evaluated the impacts of alternative truck routes in The Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3), and has added a summary of this analysis to Appendix A, Section A.6 of the Repository SEIS.

1.7.14 (2839)

Comment - RRR000540 / 0003

The commenter stated that DOE has not conducted a study of national transportation safety.

Response

DOE conducted a comprehensive study of the impacts of transporting spent nuclear fuel and high-level radioactive waste for the Repository SEIS. This study examined the radiological and nonradiological impacts of shipping these materials, incident-free impacts, and the risks and consequences of potential transportation accidents. It also included the impacts of potential sabotage events. The results of this study are in Chapter 6 and Appendix G of the SEIS.

1.7.14 (2859)

Comment - RRR000661 / 0014

For national transportation purposes, the SEIS defines the "region of influence" as the area within one-half mile of the centerline of a rail or highway right-of-way, or a rail yard boundary. (Section 3.2, page 3-90) The analysis then uses RADTRAN 5 to estimate "off-link" radiation doses to "populations" within the one-half mile buffer. (Section G-3, page G-14; Section G.5, page G-34) "Populations" are based on 2000 Census data extrapolated to 2067, except in Las Vegas, where resident population is modified to include casino guests and casino workers along the Las Vegas Strip. (Section G.3, page G-6 and G-14)

These assumptions and methods may be a useful starting point for an assessment of a national transportation program involving thousands of miles of rail and highway routes in every region of the nation. However, it does not follow that the SEIS assumptions and methods constitute an adequate description of the affected environment needed for route and needs assessment in a campaign of this import. Such a description would include, not just estimated "populations," but a systematic inventory of "features" (for example, canyons and mountain passes, refineries and hazardous material industries, key infrastructure elements--for example, bridges--and current conditions, hazardous materials flow, hospitals and nursing homes, stadiums and event centers, etc.), plus an inventory of state/local capabilities for addressing potential contingencies in various route segments. Some of these features and capabilities will be found beyond the half-mile buffer applied in the SEIS assessment. The inventories of "features" and "capabilities" should be available well before Section 180c and other campaign pre-planning efforts.

Response

Defining the populations within the regions of influence provides an adequate and appropriate basis for estimating transportation impacts and is consistent with well-established approaches for conducting transportation risk analyses. For incident-free radiological transportation impacts, the region of influence was 800 meters (0.5 mile) on either side of the railroad or highway, including those transportation routes in the State of Nevada. For the radiological impacts of transportation accidents or sabotage events, the region of influence was 80 kilometers (50 mile) from the railroad or highway. These regions of influence were used throughout the U.S. to estimate transportation impacts. The 800-meter (0.5-mile) distance is based on the distance used to estimate radiation doses in *Environmental Survey of Transportation of*

Radioactive Materials to and from Nuclear Power Plants (DIRS 185281-AEC 1972, p. 110). For transportation accidents, the 80 kilometers (50 miles) distance is based on the distance used to estimate radiation doses from accidents in *Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants* (DIRS 185281-AEC 1972, p. 94).

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.7.14 (2939)

Comment - RRR000661 / 0015

Using representative routes and shipments generated by TRAGIS, and assumptions regarding “affected environment” discussed above, the SEIS uses RADTRAN 5 and RISKIND to estimate the impacts of incident-free transportation and transportation accidents. (Section G.3) Thus, “impacts” are model calculations of projected latent cancer, vehicle emission fatalities, and accident risk. (Section G.3, Tables G-4-7) In discussing the proposed action, the SEIS briefly discusses (in Section 2.4: Collection of Information and Analysis) uncertainty and perceived risk. It concludes that “sufficient information is currently available to assess the range of impacts,” that “the public is very uncertain about the risks they face,” but that “much of the uncertainty is irreducible,” that “adverse impacts from perceptions of risk would be unlikely and relatively small,” that people can be expected to become “more risk-tolerant” as the program proceeds, and that the “social costs of perceived risk “could be mitigated...through information and education programs.” (page 2-79-81) Regarding transportation, the SEIS states that DOE would “meet or exceed the requirements of 10 CFR Part 71.” More generally, DOE would “set measurable goals and targets.....(and) implement best management practices.” (page S-49)

The best possible estimates of latent cancer and vehicle emissions fatalities cannot fully describe the effects of a transportation campaign for cross-country shipment of the nation’s spent nuclear fuel and high-level waste over a 25-year period. Such estimates cannot describe the people’s perceptions of this material, their trust in agency managers and Congressional decision makers, or their response to perceived inequity or to contingencies. They do not fully explain the importance of “best management practices” regarding such a campaign, or the special relevance of “measurable goals and targets,” and implementing “programs, procedures and controls” (S-49) in this context.

The SEIS should explicitly acknowledge that RADTRAN and RISKIND, while useful, do not fully describe the effects of the prospective national transportation campaign. While information and education

programs have roles, they do not address the range of perceptions and issues triggered by this program. ... In transportation as in other program components, best management practices (in combination with measurable goals and targets, and implementing programs, procedures, agreements, technologies and controls) are crucial. Measurable goals or targets (for modal mix and other elements) combined with implementing programs and agreements, can begin to provide assurance that best management practices are indeed being applied, thus addressing program effects not measured by RADTRAN and RISKIND.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

Risk perception and stigma are discussed in Section 2.4.4 of the Repository SEIS.

1.7.14 (3032)

Comment - RRR000661 / 0020

The SEIS proposed action would remove spent nuclear fuel from 68 commercial plant origins in 2289 dedicated train shipments (assuming 3 rail casks per train). A larger number of overweight truck shipments (2646) would be required to remove SNF [spent nuclear fuel] from just seven "generator sites (that) do not have the ability to handle a rail cask at their facilities." (Section G.3, Tables G-4 and G-8) The SEIS references "revised information on the cask handling capabilities at commercial sites" (page S-20), but it does not contrast the previous and revised information. It states that, whereas the FEIS assumed that reactor sites would modify their facilities to load large rail casks, "this SEIS does not make that assumption." (Page S-20) The SEIS does not present the site-by-site modifications previously assumed, or explain why they are now abandoned.

Overweight trucks (80-115,000 pounds) are subject to permitting requirements (generally time of day or seasonal restrictions) in each state through which they travel (Section 6.1, page 6-5). The SEIS concludes that "the impacts from the use of overweight trucks for shipments of spent nuclear fuel would be similar to the impacts from the use of legal-weight trucks." (Section 6.1, page 6-5)

The SEIS finding that the impacts of overweight trucks may be similar to those of legal-weight trucks, reflects the limitations of the SEIS's assessment methods (Section 6.3.1, pages 12 and 13), not a full assessment of the impacts of large-scale use of overweight trucks for cross-country transport.

The SEIS should acknowledge that the impacts of the use of overweight trucks go well beyond those measured by the assessment methods used. We recommend ... that the Final SEIS reexamine the use of overweight trucks for cross-country transport, with the objective that overweight trucks be used only for shipment to nearby railroads, generally within the origin state. Further, plans for implementing the proposed modal mix should specifically address options to overcome the cask loading limitations of the seven commercial facilities identified in Table G-8. For any remaining cases, DOE should engage the affected states to coordinate the application of appropriate permitting requirements. The SEIS should acknowledge that the condition of bridges and other features ... may restrict the use of overweight trucks for cross-country transport.

Response

The purpose of the assumption that some generators would not modify their sites to use rail casks for shipments was to provide a realistic yet bounding estimate of transportation impacts. Between the mostly truck and mostly rail scenarios that DOE analyzed in the Yucca Mountain FEIS and the rail scenario analyzed in the Repository SEIS, DOE has reasonably bounded the number of generator sites that might use trucks for shipments, and a detailed description of site modifications or options to overcome loading limitations is not necessary to estimate the national-level impacts of shipping spent nuclear fuel and high-level radioactive waste.

DOE has updated Chapter 6, Section 6.1.6 of the SEIS to include additional information and illustrations of legal-weight, overweight, and heavy-haul trucks. This additional information includes a discussion of the results of a study of overweight trucks conducted by DOE. In this study, overweight trucks were defined as trucks that exceeded the gross vehicle weight limit of 80,000 pounds, but weighed less than 96,000 pounds, followed axle and axle group weight limits adopted by the *Surface Transportation Assistance Act of 1982*, conformed to dimensional restrictions to operate on most major highways, and complied with the Federal Bridge Formula (which relates to the number of axles, axle and axle group spacing and the weight carried on axles and axle groups). The Repository SEIS acknowledges that permit requirements would exist for overweight trucks. At this time, many years before shipments could occur, it is premature to engage affected states in the permitting process.

1.7.14 (3056)

Comment - RRR000659 / 0005

DOE has not analyzed of the risk of terrorism created by the transportation routes under consideration.

DOE fails to address the fact that trains passing through or near major California cities are likely an attractive target for sabotage by terrorists. The United States government has concluded that terrorists may want to use a radiological dispersion device (sometimes called a “dirty bomb”) in a populated area as a means of causing mass panic and economic damage even though the casualties produced by such a device may be low. [footnote 4] The Draft Repository SEIS calculates the number of cancer fatalities that could occur due to sabotage of a shipment in an urban area and concludes that the number is not great. That exposure calculation, however, does not discuss or analyze the degree to which the shipment of radioactive waste through populated areas would increase the risk of a terrorist attack.

DOE’S choice of the Caliente or Mina routes will affect the opportunities terrorist would have to conduct a radiological attack in a populated area because the routes in Nevada will dictate how frequently radioactive waste shipments will travel through which cities in California. The choice of specific routes to be actually used within California and other states—a matter not addressed by DOE—also determines the number [of] opportunities for sabotage in a populated area. In addition, a successful terrorist attack on

a rail route would make large portions of that route unusable for an unpredictable amount of time. If the tracks merely needed to be rebuilt, the route may be out of commission for weeks, but if any radiation escaped due to the event, the route might be unusable for any commerce for years. Given that the public would likely protest continued use of a route that had been targeted by terrorists (no matter how successful the attack was), DOE may never be able to use that route again. Despite these risks, DOE fails to analyze which routes within and outside of Nevada will have relatively greater risks of sabotage.

The National Academy of Sciences has also raised concerns about the security of the proposed shipments of radioactive waste. (Draft Repository SEIS at p. H-24.) The Academy recommends that an independent, non-governmental group without institutional or financial conflicts evaluate the threats to transportation, ability of the shipping containers to withstand attack, and security requirements for protecting the shipments. The Academy further recommends that the findings and recommendations of that process be made public to the fullest extent possible. DOE's response to these recommendations is merely to point out that DOE is working with other governmental bodies to assess and improve transportation security. While using the expertise of a range of other organizations is certainly a crucial aspect of security planning, DOE does not fulfill its obligations under NEPA to inform the public about impacts from sabotage when all of this analysis is done outside of public view.

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Footnote 4 – "While much less destructive than an improvised nuclear device, the dispersed radioactive material could cause radiation sickness for people nearby and produce serious economic costs and psychological and social disruption associated with the evacuation and subsequent cleanup of the contaminated areas." (United States Government Accountability Office, "Combating Nuclear Terrorism: Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Emergency Response Capabilities Could Be Strengthened" (September 2006) at p. 8.)

Response

DOE estimated that there would be 28 latent cancer fatalities in the exposed population if a modern weapon penetrated a truck cask in an urban area. If the event occurred in a rural area, the probability of a single latent cancer fatality in the exposed population would be 0.055 (1 chance in 20). For sabotage events that involved penetration of a spent nuclear fuel rail cask with a high-energy density device, DOE estimated that there would be 19 latent cancer fatalities in the exposed population if the sabotage event occurred in an urban area. If the event occurred in a rural area, the probability of a single latent cancer fatality in the exposed population would be 0.029 (1 chance in 30). Within the limits allowed by DOE classification policy, Appendix G of the Repository SEIS presents methods and data the Department used to estimate the impacts of the sabotage event.

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4 DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences "worse" than those previously estimated would be based on pure conjecture and would not be supported by credible scientific evidence.

1.7.14 (3616)

Comment - RRR000642 / 0010

The DSEIS should consider worst case credible accident scenarios to identify the maximum consequences from a potential accident involving a spent fuel or high-level radioactive waste shipment that exceeds

package performance capability. The consequences of a severe transportation accident could be much more severe than DOE estimates. The DSEIS does not consider "worst case" accidents in which "all factors combine in the most disadvantageous way," because DOE considers such combinations of factors "not reasonably foreseeable" (DSEIS, p. G-54). Moreover, the DOE accident analysis did not consider the impacts of human error in the design, fabrication, and loading of shipping casks nor did it consider unique local conditions along rail, barge or truck routes that could result in more severe accidents or consequences. However, DOE acknowledges that clean-up costs after a very severe transportation incident involving a repository shipment resulting in the release of radioactive material could range from $300,000 to $10 billion (DSEIS, p. G-54). Having identified the upper range of clean-up costs, the DSEIS should evaluate the impacts from a credible worst case transportation accident or terrorist attack that led to the high cost estimate.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decision making. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

Section 6.3.4 of the SEIS discusses the consequences of sabotage events. The estimated consequences of a sabotage event that involved a truck cask would be 0.055 latent cancer fatality for the population in rural areas or 28 latent cancer fatalities for the population in urban areas. The estimated consequences of a sabotage event that involved a rail cask would be 0.029 latent cancer fatality for the population in rural areas or 19 latent cancer fatalities for the population in urban areas.

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

DOE also updated Section G.9.6 to provide a more-in-depth discussion of human error.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of

$300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

1.7.14 (3661)

Comment - RRR000642 / 0011

The DSEIS should examine unique local conditions or credible accident or terrorist attack scenarios that could result in conditions that exceed packaging performance standards.

Should an accident or terrorist attack occur along certain segments of possible routes in California, a resulting fire could exceed the limits of the spent fuel package to contain the radioactive materials under accident conditions. For example, two recent major highway accidents on California highways (one in the Bay Area in northern California and a tunnel fire in Santa Clarita) are being investigated to determine whether these accidents may have resulted in conditions, in particular fire temperatures and fire durations, which approached or exceeded the limits of packaging performance requirements. The potential for highway and rail accidents resulting in severe conditions in California should be evaluated considering that nearly half of the 16 historic severe accident scenarios that were examined in the National Academy of Sciences' 2006 spent nuclear fuel transport study occurred in California [footnote 1]. These accidents included extreme truck fires in highway tunnels, train derailments, and a rail accident involving a gas pipeline rupture.

The National Academy of Sciences' study recommended that detailed surveys of transportation routes for spent fuel be done to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration and fully engulfing fires and further recommended that steps be taken to avoid or mitigate such hazards. We fully concur. To be comprehensive, the DSEIS should identify the likely shipping corridors and include route-specific analyses that identify potential hazards along shipment routes. It is vital that the risk analyses should include the potential consequences of a severe accident or terrorist attack involving extreme, long duration fire conditions that exceed package performance limits.

DOE should conduct a systematic inventory of local conditions along the preferred routes that could exacerbate the consequences of a severe accident or attack, for example, tunnels, bridges, refineries, stadiums, congested urban areas, proximity to flammables or explosives in storage or transit. DOE also should conduct an inventory of state/local capabilities along route segments for handling potential consequences of a major accident. This inventory of route segment characteristics and response capability should be available before Section 180c planning and assessment efforts begin.

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Footnote 1 – "Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States." National Research Council of the National Academies, 2006

Response

Appendix G, Section G.9.4 of the Repository SEIS discusses accidents involving spent nuclear fuel casks in tunnels. Based on analyses performed by the NRC, the consequences of an accident involving a spent

nuclear fuel cask in a tunnel fire such as the Baltimore Tunnel fire or the Caldecott Tunnel fire would be very small.

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decision making. As discussed in Section 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

Section 6.3.4 of the SEIS discusses the consequences of sabotage events. The estimated consequences of a sabotage event that involved a truck cask would be 0.055 latent cancer fatality in rural areas or 28 latent cancer fatalities in urban areas. The estimated consequences of a sabotage event that involved a rail cask would be 0.029 latent cancer fatality for the population in rural areas or 19 latent cancer fatalities for the population in urban areas.

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

1.7.14 (3662)

Comment - RRR000642 / 0012

DOE should evaluate the potential for human error and intentional noncompliance with federal packaging safety standards in exacerbating the consequences of a severe accident or terrorist attacks.

DOE has concluded that regulations and regulatory practices of the NRC and the US Department of Transportation address the design, manufacture, and use of transportation packaging and that the regulations and regulatory practices are effective in preventing human error by requiring independent NRC review and approval of package design to ensure compliance and NRC's approval and audited quality assurance programs for design, manufacturing and the use of transportation packages. (DSEIS, p. G-52). DOE also said that timely and effective actions to identify and initiate corrective actions for undetected design or manufacturing defects provide assurances that undetected deficiencies would not lead to a meaningful reduction in package performance under normal or accident conditions of transportation. However, human error, for example, an undetected major flaw in the design and

certification of transportation packaging (casks) for radioactive material shipments, hidden or undetected defects in the manufacture of these packages, and error in the preparation of these packages for shipment could severely compromise packaging performance during an accident or during routine transport.

DOE should consider the potential consequences of a package not meeting federal packaging safety requirements, for example, due to a manufacturer's intentionally falsifying records in meeting these requirements. In December 2007, the Nuclear Regulatory Commission proposed a civil penalty against Alpha Omega Services, Inc., of Bellflower, California and barred the company president from NRC-licensed activity for deliberately falsifying an inspection report on a Type B package used for transporting radioactive materials. The company was charged with stating in a report of an inspection that the transportation package met NRC requirements even though the company knew the package had been modified and no longer met the specification in its certificate of compliance from the NRC. As a result of the falsified information, the NRC licensee made at least three exports of radioactive material outside of the US in violation of NRC and U.S. Department of Transportation regulations. Although the NRC was not aware of actual safety consequences, NRC considered the potential safety consequences to be significant considering the "potential adverse impact of shipping radioactive materials in the modified and unapproved package design that no longer met transportation package approval standards for both normal and hypothetical accident conditions."

Response

Appendix G, Section G.9.6 of the Repository SEIS has been updated to provide a more-in-depth discussion of human error.

1.7.14.1 National

1.7.14.1 (992)

Comment - RRR000662 / 0033

The reduced TAD use option (75 percent of commercial spent fuel) may be more realistic than the proposed action (90 percent TAD use), based on current transportation constraints at one-third of the reactor shipping sites, but this does respond to Nevada's contention that large numbers of legal-weight truck shipments will likely be required under any realistic modal mix. The national rail route option (pages A-5 to A-8) is a self-serving response to Nevada's concerns that a wide variety of factors (not just "heavy traffic congestion along northern cross-country rail corridors") could result in large numbers of rail shipments being routed through Las Vegas if the Caliente rail line is developed. The TRAGIS route analyses (shown in DIRS 181377) used for this option are clearly constrained, by blocking certain rail routes in Illinois, to prevent the model from routing traffic to the BNSF [Burlington Northern Santa Fe] system via Kansas City, which could route shipments to Caliente through California and Las Vegas. Moreover, the discussion in Appendix A ignores recent upgrading of the Union Pacific mainline between El Paso, Texas, and West Colton, California, ("the New Sunset Route") which will make that route more attractive for spent fuel shipments from current and new reactor sites in the Southeast.

Response

The transportation impacts presented in Chapter 6 of the Repository SEIS are based on a scenario where DOE based the transportation impacts in Chapter 6 of the Repository SEIS on a scenario in which it received approximately 90 percent of spent nuclear fuel at the repository in TAD canisters. Appendix A, Section A.2 presents the transportation impacts based on a scenario in which the Department received

approximately 75 percent of spent nuclear fuel at the repository in TAD canisters. The results of these analyses show that there would be very little change in the national transportation impacts if 75 percent of spent nuclear fuel arrived at the repository in TAD canisters rather than 90 percent.

If DOE selected the Caliente rail alignment, the representative rail routes analyzed in the Repository SEIS do not show large numbers of shipments through Las Vegas. The representative rail routes in Appendix G would result in DOE shipping 755 casks through Las Vegas. The representative rail routes in Appendix A would result in DOE shipping 825 casks through Las Vegas.

1.7.14.1 (2742)

Comment - RRR000661 / 0010

Regarding the (RADTRAN and RISKIND) methods used to assess the impacts of the proposed national transportation campaign, we find that they do not measure or even address the dimensions that make cross-country transport of high-level radioactive wastes the complex issue and concern that it obviously is. [footnote 2] We do not suggest abandonment of these methods, but we do recommend that their limitations be explicitly acknowledged, and we recommend that DOE then focus on the assessments and agreements needed to implement a truly "best practices" national transportation campaign. Precisely because current assessment methods do not address the full scope of impacts of a national campaign for cross-country transport of spent nuclear fuel and high-level waste, the mitigations discussed in the Draft SEIS Section S.6 (measurable goals and targets; implementing programs, procedures, and controls; and best management practices) have particular application in this context.

Footnote 2 These dimensions include issues of distribution of impacts (for example, the concerns of those that expect they may be—seemingly arbitrarily or unfairly--more affected than others), institutions (challenges to the roles, capabilities and/or traditional practices of institutions ranging from Congress to federal agencies to commercial carriers to state and local governments), societal risk (special perceptions of highly radioactive materials—not fully resolvable by scientific information and education—and the resulting behaviors), and contingency (the response of individuals and institutions to unexpected events, accidents, or institutional failure).

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.7.14.1 (2773)

Comment - RRR000523 / 0009

The EIS recognizes that more truck shipments will occur yet the EIS did not analyze this increase in truck shipments.

Response

In the FEIS, DOE analyzed shipping 1,079 truck casks in the Mostly Rail Scenario. In the Repository SEIS, the number of truck shipments increased to 2,650. Chapter 6 in the Repository SEIS analyzes shipping these 2,650 truck casks.

1.7.14.1 (2794)

Comment - RRR000679 / 0001

The focus of the Commonwealth's comments is on the transportation of nuclear materials through the Commonwealth of Virginia. The reviewing agencies did not comment on either the potential environmental impacts from the construction, operation, monitoring and eventual closure of the facility or the potential long-term impacts from the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain.

1. Natural Heritage Resources.

1(a) Agency Jurisdiction. The mission of the Virginia Department of Conservation and Recreation (DCR) is to conserve Virginia's natural and recreational resources. DCR supports a variety of environmental programs organized within seven divisions including the Division of Natural Heritage (DNH). The Natural Heritage Program's (DCR-DNH) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The Virginia Natural Area Preserves Act, 10.1-209 through 217 of the Code of Virginia, was passed in 1989 and codified DCR's powers and duties related to statewide biological inventory: maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (the habitats of rare, threatened, and endangered species, significant natural communities, geologic sites, and other natural features).

1(b) Agency Comments. DCR's Division of Natural Heritage searched its Biotics Data System for occurrences of natural heritage resources within a 2-mile radius from the representative rail and truck transportation routes displayed in Figure 6-1 (Page 6-14). Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

1(c) Findings. According to the information currently in DCR's files, there are several occurrences of natural heritage resources along the transportation corridors in Virginia that could potentially be impacted (see tables attached to DCR's comments).

In addition, the project area either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, disappearing streams and large springs. Discharge of runoff to sinkholes or sinking streams, filling of sinkholes and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination and degradation of subterranean habitat.

1(d) Threatened and Endangered Plant and Insect Species. Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and DCR,

DCR has the authority to report for VDACS on state-listed plant and insect species. DCR found that the current activity will not affect any documented state-listed plant and insect species.

VDACS has regulatory authority to conserve rare and endangered plant and insect species through the Virginia Endangered Plant and Insect Species Act. VDACS reviewed the document and stated that the document identifies endangered plant and insect species along the proposed transportation routes. Although uneventful transportation of materials should have no adverse impact on protected species, accidental or intentional disruption of transport routes could adversely impact listed species.

1(e) Recommendations. DCR has the following recommendations:

Conservation sites that are located around natural heritage resources should be incorporated into emergency response plans developed for the transportation corridors. Conservation sites are areas located around one or more rare plant, animal or natural communities which are designed to include the species and its habitat in order to allow for the species conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality and number of element occurrences they contain; on a scale of 1-5, 1 being most significant.

If karst features are encountered during transportation, please coordinate with Wil Orndorff (telephone, (540)831-4056 or Wil.Orndorff@dcr.virginia.gov) to document and minimize adverse impacts.

Since new and updated information is continually added to Biotics, please contact DCR's Division of Natural Heritage at (804)786-7951 if a significant amount of time passes before the project is implemented.

In addition, VDACS recommends that the Final Supplemental EIS include a discussion of the location of and the protocol to preserve the threatened and endangered species should disruption of transportation routes occur.

2. Wildlife Resources.

2(a) Agency Jurisdiction. The Department of Game and Inland Fisheries (DGIF), as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects (Virginia Code Title 29.1). DGIF is a consulting agency under the *U.S. Fish and Wildlife Coordination Act* (16 U.S.C. sections 661 et seq.) and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts. For more information, see the DGIF website at www.dgif.state.va.us

2(b) Agency Comments. DGIF supports the use of railways for transportation of the spent nuclear fuel to Nevada. It appears that both Virginia facilities are within close proximity to rail lines that allow for transportation to Nevada. However, DGIF states that the Draft Supplemental EIS is unclear as to whether trucks will be used to transport the materials to the rail. Also, the document is lacking in detail regarding the effects that exposure may have on wildlife, waterways and other natural resources.

2(c) Additional Wildlife Information. DGIF maintains a data base of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters. The data base is at the following web site: http://www.dgid/virginia.gov/wildlife/info_map/index.html

Questions on the data base may be directed to the Department of Game and Inland Fisheries (Shirl Dressler, telephone, (804)367-6913).

2(d) Recommendations. DGIF recommends that if trucks are used to transport the spent nuclear fuel to the rail lines that appropriate safety precautions be in place to minimize the possibility of accidents or spills. Also, if improvements or additions to the rail lines are needed, DGIF recommends that these projects be reviewed by DGIF for possible impacts upon wildlife.

3. Solid and Hazardous Wastes and Hazardous Materials.

3(a) Agency Jurisdiction. Solid and hazardous wastes in Virginia are regulated by the Virginia Department of Environmental Quality, the Virginia Waste Management Board (VWMB) and the U.S. Environmental Protection Agency. They administer programs created by the federal Resource Conservation and Recovery Act, Comprehensive Environmental Response Compensation and Liability Act, commonly called Superfund, the VWMB and reviews permit applications for completeness and conformance with facility standards and financial assurance requirements. All Virginia localities are required, under the Solid Waste Management Planning Regulations, to identify the strategies they will follow on the management of their solid wastes to include items such as facility siting, long-term (20-year) use, and alternative programs such as materials recycling and composting.

3(b) Recommendations. DEQ-Waste Division recommends that for each area in Virginia where transportation of nuclear materials will occur, DOE conduct an environmental investigation on and near the areas to identify any solid or hazardous waste sites or issues before transportation commences. The investigation should include a search of waste related databases.... For additional information, contact DEQ-Waste Division (Paul Kohler, telephone (804) 698-4208).

4. Transportation Impacts.

4(a) Agency Comments. The Virginia Department of Transportation (VDOT) states that while the project should not produce adverse traffic impacts, it is essential that the local routes used are investigated and coordinated with local agencies to accommodate critical issues such as restricted bridge weight, height restrictions, pavement width or time of travel restrictions through densely populated areas. VDOT encourages compliance with all applicable practices and standards to limit long-term environmental consequences and promote safety.

Also, as noted by the Virginia Department of Health, the proposed rail corridor from North Anna Nuclear Power Plant goes to Washington D.C., then west. Although this proposed rail corridor would avoid the Richmond Metropolitan area, it goes through D.C., which is an even larger metropolitan area.

4(b) Agency Findings. VDOT reviewed the Six Year Plan, the 2026 Plan and the Draft 2030 Long Range Plan concluded that there are no conflicts with current or future construction projects.

4(c) Recommendations. Prior to the transportation of hazardous waste through Virginia, notify the appropriate localities and contact the Virginia Department of Emergency Management at (804) 897-6500.

Also, any land use requirements, lane closures, traffic control, or work zone safety issues should be closely coordinated with VDOT's Waverly Residency (telephone, (804)524-8427) and the Louisa Residency Office (telephone, (540) 967-3710).

5. Geologic and Mineral Resources.

5(a) Agency Jurisdiction. The mission of the Department of Mines, Minerals and Energy (DMME), Division of Mineral Resources (DMR) is to enhance the development and conservation of energy and

mineral resources in a safe and environmentally sound manner to support a more productive economy in Virginia. Serving as Virginia's geological survey, DMME-DMR generates, collects, compiles, and evaluates geologic data, creates and publishes geologic maps and reports, works cooperatively with other state and federal agencies, and is the primary source of information on geology, mineral and energy resources, and geologic hazards for both the mineral and energy industries and the general public. DMME-DMR also provides the necessary geologic support for those divisions of DMME that regulate the permitting of new mineral and fuel extraction sites, miner safety, and land reclamation.

5(b) Agency Comments. The DMME states that they do not anticipate impacts to geology or mineral resources as a result of this proposed project.

6. Regional Comments. The Hampton Roads Planning District Commission states that the proposed plans are generally consistent with local and regional plans and policies.

Response

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4. It is in these more detailed plans that DOE would incorporate in its transportation plans the items identified by the Commonwealth of Virginia, such as conservation sites, karst features, transportation safety precautions, presence of solid or hazardous waste sites, prenotification before shipments through Virginia, and land use requirements, lane closures, traffic control, or work zone safety issues.

1.7.14.1 (2799)

Comment - RRR000538 / 0001

The commenter stated that the current rail infrastructure is in poor repair and subject to failure or just too dangerous.

Response

DOE disagrees with this comment. Railroad safety has continued to improve over the years. For example, in its *Overview of America's Freight Railroads* (DIRS 185501-AAR 2008, p. 6) the Association of American Railroads commented that "from 1980 to 2006, railroads reduced their overall train accident rate by 68 percent and their rate of employee casualties by 81 percent. Preliminary data indicate that safety improvements continue in 2007."

However, because of a high degree of public awareness and concern about the safety and integrity of spent nuclear fuel and high-level radioactive waste shipments by rail, the U.S. Department of Transportation Federal Railroad Administration issued its *Safety Compliance Oversight Plan for Transportation of High-Level Radioactive Waste and Spent Nuclear Fuel* (DIRS 156703-DOT 1998, all). The Safety Compliance Oversight Plan establishes the policy to address the safety of rail shipments of spent nuclear fuel and high-level radioactive waste. The plan enables the Federal Railroad Administration to:

- Continue its existing policy for routine track and signal system inspections
- Have a track geometry car operate over the selected rail route

- Implement its Bridge Inspection Policy to ensure inspection of bridges along the routes for structural soundness

- Review the carrier's rail flaw detection vehicle data to ensure integrity of the rail along the selected route

DOE acknowledges that, regardless of the measures it took or improvements in railroad safety that could occur, accidents could happen during almost 3,000 rail shipments of spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository. However, it is extremely unlikely that such accidents would be severe enough to cause a release of radioactive material from a shipping cask. Many tests, demonstrations, and studies have shown that shipping casks that are designed, manufactured, tested, certified, and operated in accordance with the rigorous standards of the NRC are robust and provide a high level of public safety for the transport of spent nuclear fuel. The NRC would certify the casks DOE would use for shipments to Yucca Mountain. For perspective, for the period from 1971 through 1998, there was only one transportation accident involving a loaded rail shipment of spent nuclear fuel, and this accident did not result in a release of radioactive material from the cask.

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.7.14.1 (2961)

Comment - RRR000655 / 0007

Inspections: On page H-6, following a reference to the CVSA [Commercial Vehicle Safety Alliance] inspection procedures, the SEIS says, "Under these procedures, each state through which a shipment passed would inspect each shipment to the repository, and a shipment would not begin or continue until inspectors determined that the vehicle and its cargo were free of defects." This is wrong and needs to be corrected.

In section H.4.9 (p. H-12), there is no mention of point of origin inspections to be done by the states. DOE's Radioactive Material Transportation Practices Manual specifies that shipments will be made available to the states for such inspections. For truck shipments, in fact, only a duly certified state inspector can apply the CVSA Level VI sticker. DOE's analysis should therefore assume that each shipment will be subject to a point of origin inspection conducted by a state inspector.

If DOE's analysis did not consider state inspections at the point of origin, then it is possible the worker exposure values are seriously underestimated. As DOE notes on p. 6-16, "escorts and inspectors would receive the highest estimated radiation doses." If DOE's analysis considered the exposure only to its own inspectors at the point of origin, then the department should redo the analysis to double the number of inspectors and their exposure at the point of origin.

Also on p. H-12, DOE says it will inspect rail shipments in accordance with, among other things, the FRA's [Federal Railroad Administration] Safety Compliance Oversight Plan (SCOP). The SCOP's references to preshipment inspections address the responsibilities of FRA or FRA-certified state inspectors. None of the inspection provisions are to be performed by the shipper. It could therefore be misleading for the SEIS to say that DOE will inspect rail shipments "in accordance with" the SCOP (p. H-12).

Because the shipper has very little role in inspecting rail shipments, the Midwestern states urge DOE to adopt and support the development of rail inspection procedures as recommended by the Rail Topic Group of the Transportation External Coordination Working Group (TEC/WG). The states that participate in the FRA's State Safety Participation Program are gearing up to pilot test these procedures. Because of its strong interest in ensuring safe shipments of spent fuel and high-level waste, DOE should support the efforts of the states and the topic group members to institutionalize these uniform procedures.

Related to truck inspections, the reference to CVSA's "enhanced standards" should be changed to "Level VI inspection procedures" (p. H-12). Also in this section, it says that "under federal regulations states and tribes could order additional inspections when shipments entered their respective jurisdictions." A subsequent reference to "crew change locations" makes it appear that the states may only conduct en route inspections of rail shipments. DOE should clarify that en route inspections could be required for truck shipments, too. DOE should also clarify that, while it will strive to arrange en route inspections of rail shipments at crew change locations, it may not always be possible to do so. Other stops for en route inspections may therefore be necessary.

Response

DOE has corrected Appendix H of the Repository SEIS in relation to Commercial Vehicle Safety Alliance inspections and railroad inspections. DOE based the transportation impact assessment on two inspections, one in the origin state and one in the destination state. However, Appendix J, Section J.1.3.2.2 of the Yucca Mountain FEIS analyzed a sensitivity case in which, under the mostly truck scenario, all shipments of spent nuclear fuel and high-level radioactive waste entering a state were inspected. Under this scenario, the annual dose to inspectors in a state that inspected all incoming legal-weight truck shipments containing spent nuclear fuel or high-level radioactive waste would be as much as 40 person-rem. Over 24 years, the population dose for these inspectors would be about 950 person-rem. This would result in about 0.38 latent cancer fatality (this is equivalent to a 47-percent likelihood that there would be 1 additional latent cancer fatality among the exposed group).

1.7.14.1 (2962)

Comment - RRR000655 / 0006

Section H.6.2 also makes mention of the National Response Plan and "Incidents of National Significance." The Department of Homeland Security is in the process of replacing the "National Response Plan" with the "National Response Framework". The "National Response Framework" document is in a pre-decisional and deliberative draft dated July 2007. According to DHS, "This Framework, upon full implementation, supersedes the National Response Plan (NRP). The Section H.6.2

also makes mention of the National Response Plan and "Incidents of National Significance." The Department of Homeland Security is in the process of replacing the "National Response Plan" with the "National Response Framework". The "National Response Framework" document is in a pre-decisional and deliberative draft dated July 2007. According to DHS, "This Framework, upon full implementation, supersedes the National Response Plan (NRP). The NRP was understood by many readers to suggest that deployment of Federal assistance or interagency incident management coordination would only follow declaration or an "Incident of National Significance" by the DHS Secretary of a formal emergency or disaster declaration by the President. In practice, many incidents call for an earlier and more effective start by DHS in coordinating and supporting response, either to forestall the incident from becoming worse or to surge more aggressively to contain it. This document therefore has eliminated "Incident of National Significance" declarations from the Framework's formal vocabulary and operational plan. Section H.6.2 should be updated accordingly.

Response

DOE has updated Appendix H, Section H.6.2 of the Repository SEIS to reflect the National Response Framework.

1.7.14.1 (3008)

Comment - RRR000655 / 0005

Emergency response: The discussion of "Unified Command" in section H.6.2 (p. H-17) should include an explicit statement that a local official would be the incident commander in most cases. The draft SEIS makes this point earlier on page H-16, but it bears repeating.

Also, in section H.8, DOE mentions the key role of emergency response capabilities in assuring shipment security: "The key elements of a secure transportation program include physical security systems, information security, materials control and accounting, personnel security, security program management, and emergency response capabilities" (H-19). Because emergency response is such an important component of shipment security, DOE must make sure to share detailed security-related information with appropriate emergency management points of contacts within the states.

Response

The Repository SEIS is not a planning document for emergency response activities. Rather, emergency response planning could use resources such as *Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents* (DIRS 156110-FEMA 2000, all) and the *National Response Framework* (DIRS-DHS 2008, all).

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4.

As DOE will describe in the National Transportation Plan and as discussed in Appendix H, Section H.4 of the Repository SEIS, for its transportation activities the Department would follow established practices in DOE M 460.2-1 (DIRS 171934-DOE 2002, all). In addition, DOE would build on and borrow from the experience and successes of the Naval Nuclear Propulsion Program and other DOE programs such as those for Foreign Research Reactor Spent Fuel and the Waste Isolation Pilot Plant to ensure that its record of safety, environmental compliance, public involvement, and operations merits public confidence. The

National Transportation Plan will discuss provisions for sharing detailed security-related information with appropriate emergency management points of contact for states and tribes.

1.7.14.1 (3048)

Comment - RRR000522 / 0002

There can be substantial impacts on White Pine County, its residents, society and local economy resulting from the Yucca Mountain repository system if constructed and made operational. A primary concern is centered on extensive and long-term transportation of spent nuclear fuel and other high-level waste by legal and overweight truck through the County on US 93/93Alt./6. Under DOE mostly rail modal preference, as many as 2,700 shipments of high level waste could move through White Pine County over a 50-year period as a result of the Yucca Mountain repository system. Should direct rail to Yucca Mountain not be available, the number of legal and overweight truck shipments through White Pine County could exceed 90,000.

DOE did not include analysis of the US 93/93Alt./6 highway route as an analyzed alternative in the Repository SDEIS. Should this route be selected for use, there would likely be quantifiable impacts to White Pine County resulting from Yucca Mountain destined high level waste transportation. Because it is possible, if not likely, that the Governor of Nevada will designate US 93/93Alt./6 through White Pine County as Nevada's preferred route for spent nuclear fuel shipments (as the state has done for LLW [low-level waste] shipments), the County would be impacted.

A study commissioned by White Pine County to assess the radiological risk to residents in the event of a severe accident which results in the breach of a containment cask finds the risk substantially greater than the risks outlined in DOE's DEIS (Radioactive Waste Management Associates, 2001). This analysis assumed an accident at the base of Murry Summit on U.S. 6 (.6 mile from the populated area of Ely), where the road conditions are steep enough to generate a severe accident. The analysis further accounted for location specific conditions to estimate exposure risk to the population and the community water system. This included, evacuation procedures and routes and local meteorological conditions for plume dispersion of the radioactivity. This study found that such an accident would result in a latent cancer risk to the local population of between 30 to 300 fatalities. Accident related radiation exposure would also cause genetic effects, such as birth defects and other non-cancerous diseases, which were not calculated for this report. The study found that a populated area of 4.5 km^2 would be contaminated, as well as a 70 km downwind area of approximately 220 km^2. Although the study did not evaluate costs of clean-up, and losses due [to] lost business and property devaluation, the study found that the whole town would have to be decontaminated, including buildings, streets, grass, etc. Further, this study found that the Ely water supply would be contaminated in concentrations high enough to require that the community utilize an alternative water supply. None of these issues have been addressed within the Repository DSEIS.

In the Repository FSEIS, DOE needs to make a realistic assessment of the risks to communities potentially bisected by both rail and highway transport routes for the spent nuclear fuel and provide appropriate mitigation efforts to reduce the risk and provide compensation for otherwise unmitigable effects.

Response

DOE evaluated the impacts of alternative truck routes in The Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3), and has added a summary of this analysis to Appendix A, Section A.6 of the Repository SEIS. The State of Nevada has not designated U.S. Highway 93, 93 Alternate, or U.S.

6 as alternate preferred routes; DOE does not intend to use these routes unless the State of Nevada designates them as alternate preferred routes.

1.7.14.1 (3348)

Comment - RRR000642 / 0008

DOE has failed to adequately evaluate the major potential transportation impacts in California from these shipments.

Under the Proposed Action, approximately 9,500 rail casks and 2,700 truck casks would be transported in California to Yucca Mountain over a period of about 50 years (DSEIS, p. 8-32). Under the "representative routes" evaluated in the DSEIS, 755 rail cask shipments (about 8 percent of the total) would enter Nevada from California and travel through downtown Las Vegas to the Caliente rail line; and 857 truck cask shipments (about 32 percent of the total) would enter Nevada from California on Interstate-15, then travel through western Las Vegas, on Interstate-215 to US Highway 95 (See p. 2-43, 2-44, and G-64). Under the expanded repository capacity scenario (143,000 metric tons and 2,303 canisters of Greater-than-Class C waste) about 24,112 rail cask shipments and 5,025 truck cask shipments would be transported through California (See p. 8-30).

If the Mina rail corridor is constructed and used, an estimated 1,963 rail casks (21 percent of the total) and 857 truck shipments (32 percent of the total) would be transported through California. These would likely include shipments of spent fuel through Sacramento, including shipments possibly from Oregon and Washington, over the Union Pacific Rail Line over the Sierra Nevada mountains through Donner Pass to Reno, Nevada. Nevada's spent fuel transportation experts have estimated a potential for even larger numbers of rail cask shipments through California to Yucca Mountain for both the Caliente and the Mina rail routing options (greater than 4,400 rail casks or more than 45 percent of the total shipments).

The DSEIS fails to fully evaluate the potential transportation impacts in California from the proposed shipments. Instead of providing more clarity and description of the routes and transportation modes to be used, the DSEIS and RA DEIS raise additional transportation uncertainties. Since 1989 the State of California has urged DOE to identify the national highway, railway and barge shipping routes for transporting the thousands of tons of high-level waste from reactor locations throughout the country to the proposed repository. However, the transportation analyses provided in Volume I, Chapter 2 and in Appendix G of the DSEIS do not identify the routes to be used. The failure to identify these transportation routes effectively keeps federal, state and local jurisdictions from identifying potentially hazardous conditions along these routes and evaluating the potential for exacerbating the consequences from an extreme accident or terrorist attack.

Although the DSEIS identifies "representative" rail and truck routes, the cross-country rail routes shown in Figure S-9 (p. S-19) are not consistent with the routes that the major railroads have identified for these shipments. For example, the rail routes in Figure S-9 show rail routes through Nebraska. However, the Union Pacific has indicated it would route cross-country rail repository shipments across Kansas, rather than Nebraska, because of more rail traffic through Nebraska compared with Kansas. The railroad believes that DOE shipments could interfere with the flow of traffic on the more congested rail line. Similarly, the Burlington Northern Santa Fe (BNSF) railroad indicated that it would not route DOE shipments on certain heavily traveled lines during high priority United Parcel Service Christmas traffic. Rail routes shown in the DSEIS do not include routes already identified by Union Pacific and BNSF as "preferred routes" to Caliente. The revised DSEIS should show the likely preferred truck and rail roads.

The DSEIS ignores the potential for rail shipments on the BNSF railroad to San Bernardino. Major transportation impacts from repository shipments are projected for Barstow and San Bernardino County as well as large numbers of potential shipments over the Cajon Pass and Donner Pass. Nevada's spent fuel transportation experts have estimated a potential for approximately 300 rail casks on about 300 barges for shipments from Diablo Canyon to Port Hueneme. DOE's Final EIS issued in 2002 for the repository, however, estimated the potential for 121-132 barge shipments from Diablo Canyon to Port Hueneme.

Nevada's transportation experts estimate the potential for large numbers of legal-weight truck shipments through California if no rail access to Yucca Mountain is developed (over 24,000 shipments or more than 45 percent of the total number of shipments). A 1996 report by the Planning Information Corporation (PIC) out of Denver, Colorado showed a southern consolidated routing scenario for East-West shipments to Yucca Mountain via California using the Interstate-40 highway and BNSF Railroad. Using this southern consolidated routing scenario, the PIC report estimated that more than 45 percent of the repository shipments could be transported through California. The DSEIS ignores the potential for more rail cask shipments through California on the Caliente or Mina rail options (more than 4,400 rail casks or more than 45 percent of the total).

The PIC 1996 report concluded that as many as 79,300 truck shipments would be required to move spent fuel and highly radioactive wastes from reactor sites around the country to a waste facility in Nevada. The report examined "current capabilities" with regard to reactor sites, equipment (for example, the containers or casks that would be used to transport deadly spent fuel and high-level waste), and the existing transportation system. PIC used this information to project transport modes, shipment numbers, and potential routes. Unlike DOE's more optimistic scenarios which assume that spent fuel and HLW [high-level radioactive waste] can readily be shipped in large rail casks, thereby limiting the number of shipments and the numbers of communities affected, the PIC report examined the capabilities that actually exist with regard to: (a) the availability of rail and highway shipping casks; (b) the ability to handle different size containers at reactor locations; (c) rail access to originating sites for spent fuel shipments; (d) which reactors would ship waste in the first three years and what their capabilities are for handling casks, (e) rail access, and other variables; and (f) mode (rail vs. truck) and routing realities as they exist today. This report concluded that a southern consolidated routing scenario using the Interstate-40 and BNSF corridors for East-West shipments to Yucca Mountain via California, would result in more than 45 percent of the repository shipments potentially being transported through California.

The potential implications and costs to California state and local jurisdictions as a result of the proposed action are significant, considering the large number of potential shipments by truck, rail and/or barge over the state's transportation corridors. The EISs fail to adequately assess the risk and impacts to state and local jurisdictions from these shipments. California's emergency response training and equipment needs to prepare for these proposed shipments, including accident prevention measures necessary to ensure their uneventful, safe transport (for example, shipment inspections and escorts) will be significant. This is particularly true for major urban areas such as Sacramento, Fresno, Bakersfield, and Los Angeles, and major rail hubs in California, such as Barstow and San Bernardino.

Under DOE's proposed policy (180c policy) for funding states to assess emergency response preparation needs along routes, states would be provided a one-time planning grant of $200,000. This amount likely would not be sufficient to assess emergency response preparation needs along the lengthy potential rail, truck and barge shipment routes in California, particularly through heavily populated large metropolitan areas such as Los Angeles County. Significant training and coordination will be required for the large

number of emergency care facilities, emergency centers, fire stations, and police stations located near possible routes in California. For example, within 10 miles of potential rail routes in California are an estimated 33 emergency care facilities, 19 emergency centers, 282 fire stations, 424 police stations and 5740 schools. (Bob Halstead, Nov. 9, 2007; FEMA MH-HAZUS Data base).

The DSEIS should identify the generator sites from which the waste would be shipped along either corridor. The DSEIS should state whether the Donner Pass route or the Feather River Canyon route would be used/preferred for connecting with the Mina Route and whether one route would be a backup for the other route. The DSEIS should describe how the operating parameters imposed on the railroads to ensure shipment safety would be monitored and enforced.

The impacts on tribal lands in California could also be significant. Eight tribes in California would be potentially impacted by rail shipments (Halstead, Nov. 9). Routine radiation exposure to populations within 1600 meters of the rail route would impact approximately 3.4 million people (Source: Halstead, Nov. 9; census 2005 Block group update). Radiation doses to workers and the public from routine operations, particularly in congested areas where shipments may be delayed, should be evaluated. The DSEIS should also consider the impacts and costs to the state from civil unrest, for example, demonstrations or protests against shipments, or acts of terrorism directed against these shipments. Potential adverse economic impacts from proposed shipments, for example, adverse impacts on tourism in national parks including the Death Valley National Park, should be considered as well.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

At this time, many years before shipments could begin, it is impossible to know the highway routes or rail lines DOE would use. States and tribes might designate alternate preferred highway routes, and there may be construction or modification of highways and rail lines in the interim. Therefore, for the Repository SEIS analysis, 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, or state or tribal designated alternate) that reduce time in transit. Federal rules do not prescribe specific routes for shipments of radioactive materials by rail. DOE based its identification of representative rail routes on current rail practices, which include consideration of a variety of factors. These factors are discussed in Appendix G, Section G.2.

DOE also conducted two sensitivity analyses related to routing. The first sensitivity analysis examined alternative rail routes to the repository and the second sensitivity analysis examined alternative highway routes used to access the repository. The results of these sensitivity analyses are contained in Appendix A, Sections A.3 and A.6 of the Repository SEIS, and show that there would be very little change in the national transportation impacts based on using alternative rail or truck routes.

The Yucca Mountain FEIS analyzed the mostly truck scenario in which DOE would ship more than 99 percent of the spent nuclear fuel and high-level radioactive waste by truck. The impacts of this scenario and the scenario in the Repository SEIS in which DOE would ship about 10 percent of the spent nuclear fuel and high-level radioactive waste by truck, would account for any increase in truck shipments caused by lack of rail access.

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4.

As DOE will describe in the National Transportation Plan and as discussed in Appendix H, Section H.4 of the Repository SEIS, for its transportation activities the Department would follow established practices in DOE M 460.2-1 (DIRS 171934-DOE 2002, all). In addition, DOE would build on and borrow from the experience and successes of the Naval Nuclear Propulsion Program and other DOE programs such as those for Foreign Research Reactor Spent Fuel and the Waste Isolation Pilot Plant to ensure that its record of safety, environmental compliance, public involvement, and operations merits public confidence.

Chapter 6 of the Repository SEIS discusses impacts of sabotage events. In the Yucca Mountain FEIS, DOE evaluated perceived risk and stigma from construction and operations of a repository at Yucca Mountain and from transportation of spent nuclear fuel and high-level radioactive waste. In the FEIS, DOE recognized that nuclear facilities can be perceived as positive or negative, depending on the underlying value systems of the individual forming the perception. Thus, perception-based impacts would not necessarily depend on the actual physical impacts or risk of repository operations, including transportation. In addition, people do not consistently act in accordance with negative perceptions, so the connection between public perception of risk and future behavior would be uncertain or speculative at best.

The FEIS concluded that, although it could measure public perception about the proposed repository and transportation of spent nuclear fuel and high-level radioactive waste, there is no valid method to translate these perceptions to quantifiable economic impacts. Researchers in the social sciences have not found a way to reliably forecast linkages between perceptions or attitudes reported in surveys and actual behavior. At best, only a qualitative assessment is possible about the broad outcomes that seem most likely. The Yucca Mountain FEIS identified studies that reported, at least temporarily, a small relative decline in residential property values could result from the designation of transportation corridors in urban areas.

The Yucca Mountain FEIS presented the following conclusions about perceived risk and stigma:

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 quantified 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.

An independent economic impact study (DIRS 172307-Riddel et al. 2003, all) conducted since the publication of the Yucca Mountain FEIS examined, among other things, the social costs of perceived risk to Nevada households living near transportation routes. The study developed such an estimate in terms of households with a willingness to accept compensation for different levels of perceived risk and a willingness to pay to avoid risk. The results of the study indicated that during the first year of transport, net job losses (and associated drop in residential real estate demand and decreases in gross state product) in relation to the baseline would occur in response to people moving to protect themselves from transport risk. However, the initial impact would be offset rapidly as the population shifted to a more risk-tolerant base. The results of this study are similar to those in the studies DOE identified in the Yucca Mountain FEIS.

Other conclusions of this study are that the public and DOE have widely divergent risk beliefs and that the members of public are very uncertain about the risks they face. At the same time, more than 40 percent of the respondents in a public survey conducted as part of this study felt that DOE information is reliable or very reliable, while another 40 percent feel that DOE information is somewhat reliable. These results suggest that DOE could mitigate social costs by reducing the risk people perceive from transport through information and education programs that are well-researched and effectively presented.

While some scenarios can envision the stigmatization of southern Nevada, it is not inevitable or numerically predictable. Any such stigmatization would probably be an aftereffect of unpredictable future events such as serious accidents, which might not occur. As a consequence, DOE did not quantify the potential for impacts from risk perception or stigma in the Repository SEIS.

For incident-free radiological transportation impacts, the region of influence is 0.5 mile on either side of the railroad or highway. For the radiological impacts of transportation accidents or sabotage events, the region of influence is 50 miles from the railroad or highway. DOE used these regions of influence throughout the United States, including California, to estimate transportation impacts. Chapter 6 of the Repository SEIS summarizes national-level transportation impacts and Appendix g summarizes state-level impacts.

DOE analyzed the existing rail corridors in California and Utah as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. Appendix G contains maps of transportation routes and state-level transportation impacts, such as those in Utah or California. In addition, Appendix G lists the number of shipments through Utah and California.

1.7.14.1 (3615)

Comment - RRR000642 / 0009

DOE has failed to describe potential major route-specific impacts in California and identify mitigation for these impacts.

There is a risk of a major, possibly long-term, disruption of transportation systems and hubs in California, for example, rail ways, rail hubs, and major interstate highways, should a major accident occur along any of California's major transportation corridors. The potential impact on California's rail and highway materials transport system from a major accident should be evaluated in the DSEIS. Rail capacity is already heavily impacted by goods being transported through California's major ports (Oakland, Los Angeles, Long Beach) from overseas. Capacity improvements that the Union Pacific and BNSF

[Burlington Northern Santa Fe Railway] are making are intended to serve intermodal and international commerce, especially in California. The DSEIS should evaluate the impact of Yucca shipments, including the use of dedicated trains, on rail service and truck transport of goods in California, in particular, the impact on rail or highway freight transport capacity. Are there assurances that commercial use of rail lines would not be adversely impacted by waste shipments? Would waste trains have priority over commercial shipments? Would waste shipments occur at times and intervals that could disrupt regular commercial traffic patterns? If waste trains travel at reduced speeds, how would this affect commercial railroad traffic, including shipping rates, as well as passenger trains?

The risk assessment of potential transportation impacts should consider route-specific conditions along any likely shipment corridors in California. These route-specific conditions include: (1) increasing rail freight traffic in California due to the increasing flow of goods and imports from Asian countries through the Ports of Oakland, Long Beach and Los Angeles, (2) California's heavily populated and congested major urban areas including Los Angeles, Sacramento, the Central Valley (Los Angeles is the second largest metropolitan region in the country), (3) the steep terrain and heavily weather-impacted rail and truck routes over the Donner Summit to Reno, Nevada, as well as corridors through southeastern California that could be heavily impacted by these shipments, for example, Cajon Pass, San Bernardino County and Barstow, and (4) certain high risk sections of track in California with prior major derailments and hazardous materials spills. The DSEIS should identify the likely rail and truck routes needed to access the Mina and Caliente routes, as well as communities and environmental resources in California potentially impacted by these shipments, so that any route-specific concerns can be addressed.

The DSEIS should describe how DOE would handle stranded/stalled nuclear waste trains, for example, during bad weather, floods causing derailments, or periods of service interruption.

DOE defines the radiological region of influence for incident-free transport as .5 miles on either side of the rail alignments centerline. For accidents and sabotage, the region of influence area is defined as 50 miles on either side. The potentially affected environment for transportation radiological impacts, including individuals, businesses, agriculture, and the natural environment should be described and impacts assessed for the region of influence along potential shipping routes in California, including through major urban areas in Los Angeles, Sacramento, and the Central Valley. DOE should estimate the number of people living, commuting, and working within the region of influence for the proposed rail, truck and barge shipment routes in California and evaluate these impacts.

The DSEIS should evaluate route-specific analyses of the companion rail segments to the proposed Caliente and Mina rail corridors. For example, the Caliente corridor could use the Union Pacific mainline that extends from Ogden, Utah, through southern Nevada to southern California. The Mina corridor could extend to Hazen and the impact analysis should include Union Pacific mainline tracks in northern Nevada from Hazen westward to Sacramento. The DSEIS should examine the full range of impacts to all affected communities in California from waste shipments to Yucca Mountain, considering the maximum shipment scenarios and likely truck shipments of waste. The potential impacts of transporting waste on lines shared by passenger service (Amtrak) should also be analyzed.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as numerous risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and*

High-Level Waste in the United States (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). The potential impacts were estimated using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

The Yucca Mountain FEIS analyzed the mostly truck scenario in which DOE would ship more than 99 percent of the spent nuclear fuel and high-level radioactive waste by truck. The impacts of this scenario and the scenario in the Repository SEIS in which DOE would ship about 10 percent of the spent nuclear fuel and high-level radioactive waste by truck, would account for any increase in truck shipments caused by lack of rail access.

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4.

As DOE will describe in the National Transportation Plan and as discussed in Appendix H, Section H.4 of the Repository SEIS, for its transportation activities the Department would follow established practices in DOE M 460.2-1 (DIRS 171934-DOE 2002, all). In addition, DOE would build on and borrow from the experience and successes of the Naval Nuclear Propulsion Program and other DOE programs such as those for Foreign Research Reactor Spent Fuel and the Waste Isolation Pilot Plant to ensure that its record of safety, environmental compliance, public involvement, and operations merits public confidence.

Chapter 6 of the Repository SEIS discusses impacts of sabotage events. In the Yucca Mountain FEIS, DOE evaluated perceived risk and stigma from construction and operations of a repository at Yucca Mountain and from transportation of spent nuclear fuel and high-level radioactive waste. In the FEIS, DOE recognized that nuclear facilities can be perceived as positive or negative, depending on the underlying value systems of the individual forming the perception. Thus, perception-based impacts would not necessarily depend on the actual physical impacts or risk of repository operations, including transportation. In addition, people do not consistently act in accordance with negative perceptions, so the connection between public perception of risk and future behavior would be uncertain or speculative at best.

DOE concluded that, although it could measure public perception about the proposed repository and transportation of spent nuclear fuel and high-level radioactive waste, there is no valid method to translate these perceptions to quantifiable economic impacts. Researchers in the social sciences have not found a way to reliably forecast linkages between perceptions or attitudes reported in surveys and actual behavior. At best, only a qualitative assessment is possible about the broad outcomes that seem most likely. The Yucca Mountain FEIS identified studies that reported, at least temporarily, a small relative decline in residential property values could result from the designation of transportation corridors in urban areas.

The Yucca Mountain FEIS presented the following conclusions about perceived risk and stigma:

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 quantified 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.

An independent economic impact study (DIRS 172307-Riddel et al. 2003, all) conducted since the publication of the Yucca Mountain FEIS examined, among other things, the social costs of perceived risk to Nevada households living near transportation routes. The study developed such an estimate in terms of households with a willingness to accept compensation for different levels of perceived risk and a willingness to pay to avoid risk. The results of the study indicated that during the first year of transport, net job losses (and associated drop in residential real estate demand and decreases in gross state product) in relation to the baseline would occur in response to people moving to protect themselves from transport risk. However, the initial impact would be offset rapidly as the population shifted to a more risk-tolerant base. The results of this study are similar to those in the studies DOE identified in the Yucca Mountain FEIS.

Other conclusions of this study are that the public and DOE have widely divergent risk beliefs and that the members of public are very uncertain about the risks they face. At the same time, more than 40 percent of the respondents in a public survey conducted as part of this study felt that DOE information is reliable or very reliable, while another 40 percent feel that DOE information is somewhat reliable. These results suggest that DOE could mitigate social costs by reducing the risk people perceive from transport through information and education programs that are well-researched and effectively presented.

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For incident-free radiological transportation impacts, the region of influence is 0.5 mile on either side of the railroad or highway. For the radiological impacts of transportation accidents or sabotage events, the region of influence is 50 miles from the railroad or highway. DOE used these regions of influence throughout the United States, including California, to estimate transportation impacts. Chapter 6 of the Repository SEIS summarizes national-level transportation impacts and Appendix G summarizes state-level impacts.

DOE analyzed the existing rail corridors in California and Utah as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. Appendix G contains maps of transportation routes and state-level transportation impacts, such as those in Utah or California. In addition, Appendix G lists the number of shipments through Utah and California.

1.7.14.1 (3706)

Comment - RRR000642 / 0017

The DSEIS fails to adequately evaluate the potential impacts from a terrorist attack on spent fuel shipments to the proposed repository.

The consequences of a successful terrorist attack could be much more severe than DOE estimates. For example, the National Academies' 2006 spent fuel transport study noted that malevolent acts against

spent nuclear fuel and high-level waste shipments are a major concern, especially following 9/11 terrorist attacks. NAS [National Academy of Sciences] recommended an independent examination of the security of spent nuclear fuel and high-level waste transportation including the threat environment, the response of spent fuel packages to credible malevolent acts, and operational security requirements for protecting spent fuel and high-level waste while in transport.

DOE acknowledges in the DSEIS that both truck and rail casks are vulnerable to terrorist attacks or sabotage involving certain types of military and commercial explosive devices. Nevada-sponsored studies have concluded that a credible attack scenario in an urban area could release enough radioactive material to cause thousands of latent cancer fatalities and require cleanup and recovery costs exceeding $10 billion. However, DOE has chosen not to consider attack scenarios involving a combination of multiple weapons that could. The DSEIS should examine, to the extent possible without exposing classified information, the bounded consequences of a terrorist attack against these shipments. The DSEIS should explain how the consequences of a severe attack or terrorist attack can be mitigated through, for example, additional security measures or emergency responder preparedness, that is, how emergency responder professionals responding to an event or escorting the shipments can respond effectively and in a timely manner to a major terrorist event involving spent fuel and high-level waste shipments.

Response

Section 6.3.4 of the Repository SEIS discusses the consequences of sabotage events. The estimated consequences of an event involving a truck cask would be 0.055 latent cancer fatality for the population in rural areas or 28 latent cancer fatalities for the population in urban areas. The estimated consequences of an event involving a rail cask would be 0.029 latent cancer fatality for the population in rural areas or 19 latent cancer fatalities for the population in urban areas.

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4 DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences “worse” than those previously estimated would be based on pure conjecture and would not be supported by credible scientific evidence.

Appendix H, Section H.6 of the Repository SEIS provides more information on transportation emergency response, Section H.8 provides more information on transportation security, and Section H.10 provides more information on the NAS recommendations. Appendix G, Section G.9.7 discusses cleanup costs.

1.7.14.1 (3744)

Comment - RRR000642 / 0018

DOE’s National Transportation Plan, for transporting spent nuclear fuel and high-level radioactive waste to the repository. At a minimum, DOE’s National Transportation Plan for repository shipments should incorporate recommendations by the National Academy of Sciences (2006) to enhance the safety and security of these shipments.

The revised DSEIS should describe DOE’s National Transportation Plan for transporting spent fuel and high-level radioactive waste to the repository in sufficient detail to provide assurances that these shipments will be transported safely and uneventfully. This transportation plan should be heavily based upon the successful transportation safety plan and program for shipments to the Waste Isolation Pilot Plant that was developed in cooperation with western states and DOE. In addition, DOE should

incorporate the following National Academy of Sciences' recommendations for enhancing the safety and security of spent fuel and high-level waste shipments from their 2006 study of spent fuel and high-level radioactive waste transport:

- An independent examination of the security of spent fuel and high-level waste transportation should be conducted before large quantity repository shipments to a repository begin including an evaluation of the threat environment, response of packages to credible malevolent acts, and operational security requirements for protecting spent fuel and high-level waste in transport.

- Transportation planners and managers should conduct detailed surveys of transportation routes to identify potential hazards that could lead to or exacerbate extreme accidents involving very long duration, high temperature, fully engulfing fires; planners should take steps to avoid or mitigate such hazards before shipments begin.

- Full-scale package testing should continue to be used as part of the analytical and testing programs to validate package performance.

- DOE should continue to ensure effective involvement of states and tribes in routing and scheduling of DOE spent fuel shipments.

- DOE should fully implement its dedicated train and mostly rail decision before DOE begins transporting nuclear waste to the repository to avoid the need for a stopgap shipping program using general trains.

- DOE should identify and make public its suite of preferred highway and rail routes for transporting spent fuel and high-level waste to a repository as soon as practicable to support state and local planning, especially emergency response planning and follow the foreign research reactor spent fuel program in involving states and tribes in these route selections to obtain access to their familiarity with accident rates, traffic and road conditions and emergency preparedness.

- There are clear safety advantages from shipping older (radiologically and thermally cooler) spent fuel first. The radiological risk from spent fuel transport drops sharply depending upon the age of the spent fuel. Therefore, the risk from these shipments would drop dramatically as well if the spent fuel generators and owners could be persuaded by DOE to ship their older fuel first. DOE should negotiate with commercial spent fuel owners to ship the older fuel first except where spent fuel storage risks at specific plants dictate the need for immediate shipments;

- DOE should begin shipments through a pilot program involving relatively short, logistically simple movements of oldest fuel from closed reactors to demonstrate the ability to transport this waste in a safe and operationally effective manner.

- DOE should immediately begin to carry out its emergency responder preparedness responsibilities defined in Section 180(c) of the NWPA. DOE should establish a cadre of professional of emergency responders to work with the Department of Homeland Security to provide consolidated "all-hazards" training materials and programs for first responders, include trained emergency responders on the shipment escort teams, use emergency responder preparedness programs for community outreach along planned routes.

- DOE should work with the Department of Homeland Security, Department of Transportation, and NRC to develop, apply, and disclose consistent, reasonable and understandable criteria for protecting sensitive information about spent fuel and high-level waste shipments. They should commit to the open sharing of information that does not require protection and should facilitate timely access to such information.

- DOE and Congress should examine options for changing the organizational structure of DOE's spent fuel transportation program to give the transportation program greater planning authority, greater flexibility to support future transportation programs and make the multiyear commitments needed to plan for, procure and construct the necessary transportation infrastructure.

In addition, the DSEIS should commit to developing a schedule, identifying routes and shipment modes and order for shipments from specific sites and how states and local jurisdictions will be notified sufficiently in advance of shipments and provided assistance to allow states, tribes and local jurisdictions to plan, train and prepare for these shipments. If DOE follows the shipment order queue as currently envisioned, there will be a hodgepodge of repository shipments from various sites with spent fuel owners and generators having the option of trading places in the shipment queue with other shipping generators/sites. Routes could open for a few years for a few shipments and then possibly close again for a few more years, with the result that state and local planning and emergency response preparation for these shipments would occur in fits and starts with potential lapses in funding and resources available for retraining and maintaining emergency response equipment appropriate for responding to accidents involving these shipments.

DOE should work with the utilities and affected states and tribes to develop a national transportation plan for repository shipments that includes a reasonable shipment schedule and site shipping priorities taking into consideration state and local needs for an overall predictable schedule and sufficient advance notification of shipments to allow adequate state and local jurisdictions to prepare adequately for these shipments.

Response

Appendix H, Section H.10 of the Repository SEIS contains the DOE position on or approach to the findings and recommendations in the National Academy of Sciences report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all).

As discussed in Appendix H, Section H.4, DOE is preparing a National Transportation Plan for developing, implementing, and operating a transportation system to move spent nuclear fuel and high-level radioactive waste from 76 generator sites in 34 states to the Yucca Mountain Repository. DOE will

also prepare more detailed plans, such as the Transportation Operations Plan and individual site plans. These plans are also discussed in Appendix H, Section H.4.

1.7.14.1 (3746)

Comment - RRR000642 / 0019

If DOE plans to use State Route 127 as an access route for repository shipments by truck, the Draft SEIS should carefully assess the risks and potential impacts from using this route for shipments as well as its potential use for heavy trucks needed for repository construction and operations activities and rail line construction.

California officials have expressed concern that DOE will route spent fuel and high-level waste shipments on California roads not designated for heavy truck traffic, such as State Route 127 in southern California for spent fuel shipments from eastern states to the proposed repository. SR 127 is the major access route to the Death Valley National Park and is not approved for highway-route-controlled quantity shipments, such as spent nuclear fuel. Concerns about the use of SR 127 for Yucca Mountain shipments include its road conditions, periodic flash floods, seasonal peaks in tourists (Death Valley National Park has approximately 800,000 to 1.25 million visitors each year), the scarcity and remoteness of emergency responders in the region, and the impacts on the road from increased heavy truck traffic.

However, there are limited southern access routes to Yucca Mountain. Concern in California increased with DOE's decision to reroute through California via SR-127 a major portion of DOE's nuclear waste shipments to and from the Nevada Test Site (NTS) through California via SR 127. Beginning in January 2000, DOE began using SR-127 for a major portion of thousands of low-level radioactive waste shipments to NTS. Later DOE transported transuranic waste shipments on SR 127 from NTS to WIPP, although there were shorter, more direct routes in Nevada. U.S. Senators Dianne Feinstein and Barbara Boxer, the California Congressional chairs Sam Farr and Jerry Lewis, as well as Inyo and San Bernardino counties, and the Cities of Needles and Barstow, strongly objected to rerouting these shipments from eastern states through California over greater distances.

SR 127 was analyzed in the Draft EIS (2002) as part of an alternate route for repository shipments. U.S. Department of Transportation regulations restrict DOE shipments to interstate highways, bypasses or beltways or routes designated by a state or tribe. SR 127 was proposed by the State of Nevada as an alternate route and was included for analysis in the Draft EIS (2002) as part of a sensitivity analysis of potential routes. The sensitivity analysis concluded in the EIS that routes using SR-127 (Cases 2 and 3) as comparing favorably to the base case. It appears that California's concerns about the use of SR 127 were not adequately incorporated in the EIS evaluation. If DOE contemplates using SR 127 as an access route for spent fuel shipments by truck to the repository, the revised DSEIS should carefully assess the potential risks and impacts, including the impacts from heavy truck use along this route during repository construction as well as the construction of the rail alignment to the Yucca site.

Response

DOE evaluated the impacts of alternative truck routes in The Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3), and has added a summary of that analysis to Appendix A, Section A.6 of the Repository SEIS, which includes California State Route 127. The representative truck routes that DOE presented in the Repository SEIS follow U.S. Department of Transportation routing regulations (49 CFR 397, Part D) for highway-route-controlled quantities of radioactive material, which limit shipments to preferred routes such as Interstate Highways and bypasses and beltways around cities. DOE does not intend to use State Route 127 unless the State of California designates it as an alternate preferred route.

1.7.14.1 (3747)

Comment - RRR000642 / 0020

DOE should provide details for how it plans to achieve its objective of transporting 90 percent of the shipments by rail in TADS and explain to what extent truck shipments may be used, as opposed to rail, during the initial years of shipment pending construction, completion and operation of a rail line to Yucca Mountain.

The DSEIS should describe how DOE will make-up its dedicated trains at reactor shipment origin sites or nearby rail yards and how it will address infrastructure limitations at reactor sites (for example, sites which lack spent fuel repackaging facilities and equipment or rail access, etc.). The possibility of shipment mostly by truck should be fully evaluated as an alternative in the DSEIS including truck shipments to Yucca Mountain from all waste generator sites over the life of the project in the event that a rail line is not constructed to Yucca Mountain. DOE should describe the likely ratio of rail use to heavy-haul truck use, describe the procedures and locations for the intermodal transfer of waste, needed safety measures and routes, and assess the impacts. DOE should also describe the possibility of a northern and southern approach to Yucca Mountain that would accommodate seasonal weather or road/rail conditions. DOE should present a range of TAD implementation scenarios and not rely solely on a "90 percent use of TADs", since there are uncertainties associated with use of TAD at each reactor site (for example, some sites lack cask handling capabilities; more than 10 percent of the spent fuel may already be packaged and sealed in dual-purpose canisters.)

The DSEIS should describe the safety record of rail transport of hazardous and radioactive materials in the US.

Response

DOE based the transportation impacts in Chapter 6 of the Repository SEIS on a scenario in which it received approximately 90 percent of spent nuclear fuel at the repository in TAD canisters. Appendix A, Section A.2 presents the transportation impacts based on a scenario in which the Department received approximately 75 percent of spent nuclear fuel at the repository in TAD canisters. The results of these analyses show that there would be very little change in the national transportation impacts if 75 percent of spent nuclear fuel arrived at the repository in TAD canisters rather than 90 percent.

Appendix J, Section J.1.4.2.3.1 of the Yucca Mountain FEIS discusses transportation accidents involving radioactive material. For perspective, for the period from 1971 through 1998, there was only one transportation accident involving a loaded rail shipment of spent nuclear fuel, and this accident did not result a release of radioactive material from the cask.

1.7.14.2 Nevada

1.7.14.2 (4162)

Comment - RRR000682 / 0002

Impacts to Public Health not Evaluated along UPRR in Northern Nevada and Utah

Impacts to Public Health not Evaluated along Union Pacific Railroad in Northern Nevada and Utah

The commenter stated that the Repository SEIS did not examine potential direct, indirect, and cumulative impacts to public health associated with transportation impacts along the northern Union Pacific Railroad

in Nevada and Utah, and that DOE has never examined this route in any of the EISs it has prepared for Yucca Mountain.

Response

DOE evaluated the existing rail corridors from California and Salt Lake City to the Hazen Siding and then to Yucca Mountain as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. Appendix G of the SEIS contains maps of transportation routes and state-level transportation impacts that could occur in Utah or Nevada. In addition, Appendix G lists the number of shipments through Utah and Nevada.

1.7.14.2 (4180)

Comment - 2 comments summarized

Critical Infrastructure - Reno Trench

Commenters suggested that DOE analyze impacts to critical infrastructure. They cited the Reno ReTRAC rail corridor that runs through the middle of the city, along the major transportation corridor, Interstate Highway 80, and within several hundred feet of the Truckee River (which provides drinking water for the entire northern Nevada region). Commenters stated that the Rail Alignment EIS fails to study adequately the viability and safety of the Union Pacific rail corridor and ReTRAC trench as a possible terrorist sabotage target, with dozens of large hotel/casino properties lining the rail corridor. Commenters also stated that radiological impacts would be severe under the Mina alternative with the region of influence for radiological impacts to members of the public during incident-free transportation at 0.5 mile on either side of the rail line. They stated that this would encompass more than 6,700 hotel rooms (not including motels) and nearly 2,000 residential condominium units in the downtown core. Commenters also stated that, in a worst-case radiological accident or sabotage, populations within 50 miles of either side of the centerline would be affected (which would include all of Reno, Sparks, and Carson City among other large population centers).

Response

The impacts for a person who lived near the Reno Trench are listed in Chapter 6, Table 6-15 of the Repository SEIS. The estimated probability of a latent cancer fatality for this person would be 0.0000029 over the entire duration of the shipping campaign.

DOE has updated Section G.9.8 of the SEIS to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations. For these specific locations, the maximum reasonably foreseeable transportation accident (with an annual probability greater than 1×10^{-7}) would not result in any release of radioactive material from the interior of the cask. It would result in some additional exposure to surface radiation emitted from the cask, resulting in an impact of less than 1 latent cancer fatality.

1.7.14.2 (1046)

Comment - RRR000663 / 0027

The evaluation of alternative highway routes is inadequate, incomplete, and relies on numerous questionable assumptions. The most likely alternative highway route (the NDOT “B” route from I-80 to US 93 to US 6 to US 95) is not analyzed at all; the primary route (Interstate Highway 15 to US 95) assumes infrastructure (the I-215 beltway) that may not be useable given uncertainties over its status as

part of the interstate highway system, and ignores the current HM 164 default route (Interstate Highway 15 connecting directly with US 95 in Las Vegas).

Response

The Yucca Mountain FEIS (DIRS 155970-DOE 2002, Appendix J, Section J.3.1.3) evaluated the impacts of alternative truck routes in Nevada. DOE has added a summary of this evaluation to Appendix A, Section A.6 of the Repository SEIS. This evaluation includes a route that connects Interstate Highway 15 directly to U.S. Highway 95 at the Las Vegas Spaghetti Bowl.

1.7.14.2 (1432)

Comment - RRR000656 / 0033

Traffic accidents are a concern due to the increase in the volume of both automobile and truck traffic.

Every effort should be made to upgrade the existing highways in the vicinity of the repository and along other transportation routes. Nye County expects that such upgrades will occur before YMP rail or repository construction begins. In particular, Highway 95 must be expanded to four lanes from Mercury to Lathrop Wells.

Response

Roadway performance can be characterized in terms of level of service, which consists of a qualitative ranking of traffic conditions experienced by users of a roadway facility. There are six levels of service that characterize the performance of roadways; ranging from level of service A, which represents the best operating conditions (that is, free flow), to level of service F (the worst) (DIRS 176524-Transportation Research Board 2001, p. 2-3). The determination of the level of service of a given roadway is based on factors that affect how users perceive the quality of service they are receiving on a roadway, such as speed, travel time, freedom to maneuver, traffic interruptions, and comfort.

In the area of the intersection of Nevada State Route 373 and U.S. Highway 95 near Gate 510 to the Nevada Test Site, the existing level of service is B, which represents almost free flow (DIRS 185463-Facanha 2008, all). During the construction and operations analytical periods of the repository, traffic would increase in this area. As a result of this traffic increase, the level of service at the intersection of Nevada State Route 373 and U.S. Highway 95 near Gate 510 to the Nevada Test Site would drop from level of service B to level of service D, which indicates high density traffic but still stable conditions (DIRS 185463-Facanha 2008, all). If U.S. Highway 95 were widened to four lanes, the level of service would improve to A.

1.7.14.2 (2034)

Comment - RRR000682 / 0003

The EIS ignored potential impacts and analysis of transporting spent nuclear fuel and high-level nuclear waste through northern Nevada along the existing Union Pacific rail line.

Response

DOE analyzed the existing rail corridors from California and Salt Lake City to the Hazen Siding to Yucca Mountain as part of the national transportation analysis in Chapter 6 and Appendix G of the Repository SEIS. Appendix G contains maps of transportation routes and state-level transportation impacts that could occur in Utah or Nevada. In addition, Appendix G lists the number of shipments through Utah and Nevada.

1.7.14.2 (2072)

Comment - RRR000680 / 0009

Failure to adequately assess noise and vibration—Any increase in the volume of trains in the ReTRAC trench (DOE estimates as many as 20 trains per week) would substantially lead to more noise and vibration in the downtown hotel core, which makes our tourist destination less desirable.

Response

If the Caliente rail alignment were chosen, there would likely be no shipments through Reno. If the Mina rail alignment were chosen, only about two additional rail cars would be shipped through Reno per day. The majority of these shipments would be construction materials, repository components, and consumables such as fuel oil. This increase in the level of traffic through Reno would not lead to substantially more noise and vibration in the downtown hotel core.

1.7.14.2 (3988)

Comment - RRR000014 / 0004

The commenter cites the Draft Repository SEIS, Section 6.4.1.11.2, Other Nevada Transportation Impacts, and interprets the last bullet to mean that 1 out of 8 people in Nevada will die. The commenter asks why DOE thinks this would be a small impact.

Response

In Chapter 6, Section 6.4.1.11.2, the SEIS states that "The total number of radiological and nonradiological fatalities from truck shipments of spent nuclear fuel and high-level radioactive waste within Nevada would be 0.12 (about 1 chance in 8)." This means that the probability of a single fatality during the entire duration of the project is 0.12 (about 1 chance in 8), not that 1 in 8 people in Nevada will die.

1.7.14.2 (4098)

Comment - RRR000175 / 0003

The commenter asked what happens when a container of spent nuclear fuel and high-level radioactive waste spills enroute to Yucca Mountain and provides ideas about dire consequences that could occur. She stated that she does not know about any workable large-scale plans for evacuation and/or treatment of exposed victims, and posed several questions regarding how such a spill would be handled. She asserted that DOE has fought past efforts by "downwinders" to gain assistance from the Department.

Response

Appendix H, Section H.8 discusses transportation emergency response, including the roles and responsibilities associated with emergency response and federal coordination involving emergency response. States and tribes along shipping routes have the primary responsibility for the protection of the public and environment in their jurisdictions. If an emergency that involved a DOE radioactive materials shipment occurred, incident command would be established based on the procedures and policies of the state, tribe, or local jurisdiction. When requested by civil authorities, DOE would provide technical advice and assistance including access to teams of experts in radiological monitoring and related technical areas. DOE staffs eight Regional Coordinating Offices 24 hours a day, 365 days a year with teams of nuclear engineers, health physicists, industrial hygienists, public affairs specialists, and other professionals. Under NWPA Section 180(c), DOE must provide technical assistance and funds to states for training for public

safety officials of appropriate units of local government and American Indian tribes through whose jurisdiction DOE plans to transport spent nuclear fuel or high-level radioactive waste. Training must cover procedures for safe routine transportation of these materials as well as for emergency response situations.

DOE would require selected carriers to provide drivers and train crews with specific written procedures that defined detailed actions for an emergency or incident that involved property damage, injury, or the release or potential release of radioactive materials. Procedures would comply with U.S. Department of Transportation guidelines for emergency response in the 2004 Emergency Response Guidebook (DIRS 175728-DOT 2004, all) and would address emergency assistance to injured crew or others who were involved in identification and assessment of the situation, notification and communication requirements, securing of the site and controlling access, and technical help to first responders.

1.7.15 Accidents

1.7.15 (411)

Comment - RRR000329 / 0004

The commenter pointed out that there are drastically different cancer and casualty predictions from DOE and the State of Nevada estimates, even though they use the same computer programs.

Response

The State of Nevada has estimated the drastically different cancer and casualty predictions using computer programs that DOE developed and uses. However, the state's analysis used values for parameters that would be at or near their maximum values. DOE guidance for the evaluation of accidents in environmental impact statements (DIRS 172283-DOE 2002, p. 6) specifically cautions against the evaluation of scenarios for which conservative (or bounding) values are selected for multiple parameters because the approach yields unrealistically high results. DOE believes the State of Nevada estimates are unrealistic and that they do not represent the reasonably foreseeable consequences of severe transportation accidents or sabotage events.

1.7.15 (606)

Comment - RRR000015 / 0004

The commenter expressed a preference for the Mina alternative alignment because the route would not enter Meadow Valley Wash, a tributary to the Colorado River. Should an accident and release of radioactive material occur on the Caliente alignment, the drinking water supply for 20 million people could become contaminated.

Response

This Repository EIS does not specifically analyze a transportation accident involving contamination of surface water or groundwater. Analyses in previous EISs 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 such 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, all) showed that the impacts of the water contamination scenario were about one-fiftieth of the impacts of a comparable accident in an urban area.

In addition, the shipping casks DOE would use 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 ensured the casks performed their safety functions even when damaged. The casks would be designed to be watertight even after a severe accident. Further, the high-level radioactive waste would be in a solid form that would not be easily dispersed (ceramics, metals, or glasses).

1.7.15 (917)

Comment - RRR000662 / 0009

In the Draft SEIS, DOE describes the airspace restriction that it believes will reduce the probability of a military aircraft crash impacting the repository facilities to below the level at which consequences need to be analyzed. Although DOE states that it has "controlling authority" over most of the airspace analyzed, it has not been able to reach any agreement with the Air Force over the specific restrictions it wants to apply. Further, the "controlling authority" is not vested in the Yucca Mountain program, but rather seems to accrue to the Nevada Test Site. DOE must obtain a Congressional Land Withdrawal for the Yucca Mountain site in order to comply with the NRC requirement to demonstrate ownership and control of the site. There is no certainty that "controlling authority" would transfer to the Office of Civilian Radioactive Waste Management with a land withdrawal, and thus there is no certainty that the airspace restrictions on Air Force flights DOE says it needs will be realized and implemented.

For the remaining portion of the airspace analyzed, DOE must obtain special-use airspace permission from the Federal Aviation Administration to apply the same needed flight restrictions. It is also uncertain whether this can be accomplished.

With no certainty that any of the conditions necessary for DOE to be able to apply the flight restrictions it says it needs, for purposes of this SEIS DOE should have provided a comprehensive consequence analysis of military aircraft crash events at the repository site, including [ordnance] scenarios. We note that such an analysis was done in summary form in regard to a sabotage scenario involving a commercial aircraft.

Response

NEPA does not require that all permits or approvals be acquired before an EIS is finalized. DOE has identified the permits and approvals it would need to implement the Proposed Action, which is consistent with its obligations under NEPA. The overflight restriction is an analytical assumption to determine aircraft crash frequency estimates. The potential for crashes involving ordnance is addressed in *Frequency Analysis of Aircraft Hazards for License Application* (DIRS 180122-BSC 2007, all) and summarized in Appendix E, Section E.2.1.2.1 of this Repository SEIS. The impacts associated with the sabotage event involving a commercial aircraft analyzed in Section E.7 of the SEIS would be similar to those for a military aircraft crash.

1.7.15 (1454)

Comment - RRR000867 / 0010

The draft SEIS states if there would be an earthquake, radioactive materials could be released from the HEPA [high-energy particulate air] system and the Low Level Radioactive Waste Facility. Since a potential release has been identified, please try to redesign and construct the HEPA system and Low Level Radioactive Waste facility so it would not be possible.

Response

Chapter 4, Section 4.1.8 of this Repository SEIS identifies an accident scenario involving a release from the high-energy particulate air filter system and the Low Level Radioactive Waste Facility resulting from an earthquake. The probability of this event would be low, and the offsite impacts in terms of radiation dose would be minimal.

1.7.15 (1575)

Comment - RRR000690 / 0042

Potential damage to the health and safety of tribal members from possible exposure to radiation due to a depository or rail accident or terrorist attack.

Response

Section 4.1.8 and Appendix E of this Repository SEIS discuss health impacts from repository accidents and a potential sabotage event. Section 6.4.1.11 of the SEIS discusses health impacts from transportation accidents and a potential transportation sabotage event in Nevada. These results show that accidents resulting in a release of radioactivity would have low probabilities and the health impacts to the general public, including tribal members, would be small.

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as many risk assessments, such as the impact analyses in Chapter 6 and Appendix G of this Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

1.7.15 (1581)

Comment - RRR000690 / 0036

Potential impacts to infrastructure such as roads and power lines and to emergency response in case of an accident on the reservation or within the tribal emergency response area. Potential impacts to land use outside the 50-mile radiological region, due to the possibility of a transportation accident or accident at the Yucca Mountain site.

Response

Accident impacts outside the 50-mile radius of the repository would be negligible due to atmospheric dispersion of, and radionuclide deposition from, the radioactive plume. If there was a transportation accident on the reservation or within the tribal emergency response area, there would be no release of radioactive material from the transportation cask in 99.99 percent of accidents; in only 1 out of 10,000 accidents would a release of radioactive material from a transportation cask occur. Therefore, it is likely that there would be no impacts to land use, roads, or power lines from a transportation accident.

1.7.15 (1593)

Comment - RRR000325 / 0005

DOE needs to fully analyze the earthquake risks at its proposed interim storage site at Yucca, especially considering the earthquake fault line recently discovered directly underneath DOE's original aging pad location.

Response

DOE is not proposing an interim storage site at Yucca Mountain. The Department was aware of the earthquake fault mentioned by the commenter, but new data show it in a slightly different location. Appendix E, Section E.3.5 of this Repository SEIS discusses accidents involving seismic events at the repository. Appendix E of the SEIS includes the results of the *Seismic Event Sequence Quantification and Categorization Analysis* (DIRS 183621-BSC 2008, all).

1.7.15 (1681)

Comment - RRR000620 / 0016

Table 4-25, page 4-71, states the maximally exposed offsite individual would receive 23 rem under 95th-percentile meteorological conditions. The corresponding table in Appendix F also has this value. This value is likely much lower and a misprint in both tables based on the corresponding latent cancer fatality probability. Summary section, S.3.1.8.l says the value is 23 millirem. The value should be corrected.

Response

DOE has renamed the accident referred to by the commenter as "seismic event resulting in LLWF collapse and failure of high-energy particulate air filters and ductwork in other facilities," and has updated the radiation dose associated with the accident.

1.7.15 (1682)

Comment - RRR000620 / 0015

Section 4.1.8.1.4 and Appendix E.3.3.1: Oxidation rates are strongly dependent on temperature, among other factors; accordingly the SEIS should indicate the elevated temperature considered in the development of the 30-day release period.

Response

If a canister containing commercial spent nuclear fuel is breached as a result of a Category 2 event sequence, spent fuel can be exposed to air and begin to oxidize if the cladding has failed. DOE conservatively assumed that fuel oxidation begins immediately and continues unabated for 30 days. The spent fuel in the canister would oxidize at a steady rate, based on the maximum allowable cladding temperature of 400 degrees Celsius for spent nuclear fuel handled in the surface facilities, and 100 percent of the oxidation release would occur in 30 days.

Although recovery actions can realistically occur much more quickly to limit oxidation (cooling, confinement, etc.), DOE has taken no credit for reducing or stopping the oxidation of the spent fuel.

The 30-day release period has typically been used as a licensing precedent in estimating design-basis accident doses involving spent nuclear fuel releases under 10 CFR Part 72, and long-term reactor accident releases under 10 CFR Part 100 (DIRS 181818-BSC 2007, p. 4).

Appendix E, Section E.3.3.1 of the SEIS discusses fuel oxidation.

1.7.15 (1766)

Comment - RRR000657 / 0022

Comment: Section 4.1.8.2, page 4-69: This section states, "The analysis assumed neither DOE nor other government agencies would implement mitigation measures, such as evacuation, to limit long-term radiation doses." This is an unreasonable assumption for accident analyses.

Resolution: At a minimum, the accident scenarios with the highest consequences should be reevaluated using reasonable assumptions regarding evacuation and other factors and state those results along with the grossly conservative (bounding) analysis results.

Response

DOE has updated Appendix E, Section E.4.3 of this Repository SEIS to include an evaluation of the effects of evacuation and interdiction on the consequences of accidents.

1.7.15 (1924)

Comment - RRR000861 / 0005

The commenter pointed out that there are drastically different cancer and casualty predictions between DOE and the State of Nevada estimates, even though they use the same computer program.

Response

The State of Nevada has estimated the drastically different cancer and casualty predictions using computer programs that DOE developed and uses. However, the state's analysis used values for parameters that would be at or near their maximum values. DOE guidance for the evaluation of accidents in environmental impact statements (DIRS 172283-DOE 2002, p. 6) specifically cautions against the evaluation of scenarios for which conservative (or bounding) values are selected for multiple parameters because the approach yields unrealistically high results. DOE believes that the State of Nevada estimates are unrealistic and that they do not represent the reasonably foreseeable consequences of severe transportation accidents or sabotage events.

1.7.15 (1936)

Comment - RRR000677 / 0008

DOE assumes the specifications for the storage (aging) overpacks would allow them to withstand the crash of an F-15 fighter aircraft with an impact speed of 150 meters per second. SEIS at E-11, E-12 and E-30. The State begs to differ. Using DOE-STD 3014-96, the State of Utah has modeled and analyzed the impact of an F-16 fighter jet into a Holtec HI-STORM 100, Rev. 0, overpack, stored on a 3 foot thick concrete pad. The State's analysis is relevant to an aircraft crash into overpacks stored on the proposed aging pads at the repository. Unfortunately, the State is prohibited from releasing the report because it submitted the analysis to the NRC in the Private Fuel Storage LLC ISFSI licensing proceeding, Docket No. 72-22, and NRC classified it as safeguards information. Utah urges DOE to obtain a copy of Utah's modeling and analysis from the NRC. After reviewing Utah's analysis, DOE should find that it cannot exclude the overpacks from the aircraft crash frequency evaluation.

Response

At the proposed repository, nearly all commercial spent fuel aging would occur with the fuel in TAD canisters with an associated overpack system. The design-specifications for the TAD aging overpack require that the design be able to withstand the impact of an F-15 aircraft.

1.7.15 (1937)

Comment - RRR000677 / 0007

DOE should conduct a dynamic accident analysis. A comprehensive assessment of the environmental impacts of the TAD canisters, the shipping casks, and the aging casks cannot be made without actual stress/strain failure data for high load, instantaneous, three dimensional dynamic impacts. Without such

data there are too many uncertainties in the applicable static test data for that data to be reliable. Uncertainties arise from the residual stresses, high strain rates, large strain gradients in the failure area and from the cask welding and fabrication process.

Response

The NRC would certify the casks used to transport radioactive materials to Yucca Mountain. The certification process, which includes dynamic accident analysis, ensures that casks used to transport radioactive materials would be protective of public health even in the unlikely event of a very severe accident. Spent nuclear fuel and high-level radioactive waste are transported in very robust casks, designed to withstand the impact forces and fires that could occur with very severe transportation accidents. Further, the casks are designed to be watertight following severe accidents. Many 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. A Sandia National Laboratories study for the NRC (DIRS 152476-Sprung et al. 2000, all) concluded that casks would continue to contain spent nuclear fuel in more than 99.99 percent of all accidents. See Section H.5 of this Repository SEIS for additional information on the safety and testing of transportation casks. Appendix E, Section E.4.2 of the SEIS discusses impacts from drops of TAD canisters and shipping casks during repository operations.

1.7.15 (2129)

Comment - RRR000657 / 0021

Comment: Section 4.1.8.4, page 4-67: This section discusses a conservative assumption regarding consequence mitigation. No interdiction is assumed after a severe accident. Bounding analyses may be adequate for regulatory purposes, but they far overstate consequences in environmental impact assessments.

Resolution: A more reasonable scenario should also be analyzed, and its results should be presented.

Response

DOE has updated Appendix E, Section E.4.3 of this Repository SEIS to include an evaluation of the effects of evacuation and interdiction on the consequences of accidents.

1.7.15 (2278)

Comment - RRR000769 / 0010

The commenter stated that the analysis of accidents related to aircraft crashes was inadequate.

Response

DOE is not proposing to operate the repository unless the overflight restrictions referred to in this Repository SEIS were in place and operating. The overflight restriction is an analytical assumption to determine aircraft crash frequency estimates. Probability assessments have shown (see Appendix E, Section E.2.1.2.1) that the probability of an accidental crash of an aircraft into the repository is below NRC requirements and also below the frequency threshold recommended by DOE under NEPA. Appendix E, Section E.7 of the SEIS evaluates a sabotage event involving a commercial air crash into a building, which would produce the most damage to the waste packages, and provides estimated impacts. A military aircraft crash into the same building would produce essentially the same impacts.

1.7.15 (2677)

Comment - RRR000688 / 0077

The commenter stated that the TAD canisters need more study in relation to accidents.

Response

The NRC would license TAD canisters in accordance with 10 CFR Parts 71 and 72. The canisters would be able to withstand the accident conditions.

1.7.15 (2807)

Comment - RRR000712 / 0010

The commenter stated that the analysis of accidents related to aircraft crashes was inadequate.

Response

DOE is not proposing to operate the repository unless the overflight restrictions referred to in this Repository SEIS are in place and operating. The overflight restriction is an analytical assumption to determine aircraft crash frequency estimates. Probability assessments have shown (see Appendix E, Section E.2.1.2.1) that the probability of an accidental crash of an aircraft into the repository is below NRC requirements and below the frequency threshold recommended by DOE under NEPA. Appendix E, Section E.7 of the SEIS evaluates a sabotage event involving a commercial air crash into a building, which would produce the most damage to the waste packages, and provides estimated impacts. A military aircraft crash into the same building would produce essentially the same impacts.

1.7.15 (2885)

Comment - RRR000688 / 0035

The commenter wants to know the risks from sabotage to ventilation fans, generators, cooling towers and air conditioners.

Response

Loss of ventilation fans, generators, cooling towers, or air conditioners, even if deliberate, would not result in a release of radioactive material. Ample time would be available to restore or replace this equipment before overheating of the waste could occur. Further, such an event would be very unlikely due to access restrictions and other security measures at the repository, as described in Appendix E, Section E.7 of this Repository SEIS.

1.7.15 (2888)

Comment - RRR000688 / 0034

The commenter wants to know if DOE would put fire barriers in place, and what is the emergency fire plan.

Response

The requirements for fire barriers and fire protection will meet DOE and NRC requirements. As discussed in Chapter 2, Section 2.1.2.3.6 of the Repository SEIS, a fire protection and firefighting services facility is part of the repository design. DOE will develop emergency firefighting plans to ensure that any fires would be adequately controlled.

1.7.15 (2890)

Comment - RRR000688 / 0032

The commenter stated that if the maximum accident would be a breach of a dual-purpose canister with 36 pressurized-water reactor assemblies, these canisters should not be allowed.

Response

Even though the analysis assumed a dual-purpose canister drop with 36 pressurized-water reactor assemblies would result in a breach, the probability of the event is low, and the consequences would be well within NRC dose requirements (10 CFR 63.2) for repository accidents.

1.7.15 (3040)

Comment - RRR000681 / 0009

It appears that the risk assessment in the two EIS documents has been internally evaluated against DOE criteria. There are many other guidelines for risk assessment (for example, USNRC, US Army, National Research Council, NASA, ASME, ANS, AIChE, and others nationally and internationally) and the analysis, as presented, will not stand up as well to those criteria. While the analyses appear to follow standard modeling approaches, there are errors in the presentation, missing units in tables of results in the Summaries, errors in the example calculations provided in the Appendices, and a lack of consideration of uncertainties. Rather than a full spectrum of accident scenarios, DOE has often selected a representative scenario. There are statements of assumptions, without justification or consideration of the extent of possible error. There are claims of conservatism in a calculation, when one aspect is treated conservatively and others have wide potential uncertainty that is not acknowledged. Such problems do not mean that the risk is high; however, they do not enhance confidence in the analysis.

Response

DOE has used risk assessment methods well accepted by the risk assessment technical community, including the NRC. The Department based the risk assessments in this Repository SEIS on approaches for evaluating scenarios that could affect an engineered structure. Appendix E, Section E.2 of the SEIS describes these fault tree approaches, which consider uncertainty. Uncertainties are generally accounted for by use of conservative assumptions that bound the results. The use of representative scenarios is appropriate provided the analysis addresses potential consequences. The criteria DOE used to evaluate impacts are from EPA and NRC regulations.

1.7.15 (3084)

Comment - RRR000681 / 0010

The most complete presentation of the approach to risk assessment appears in Appendix E of the Repository EIS. However, the introductory paragraphs call the relevance of the reported analysis into question:

“Since the completion of the Yucca Mountain FEIS, the Department has modified the design and operating philosophy for the repository. DOE would now use phased construction of multiple surface facilities, and most of the commercial spent nuclear fuel would arrive in transport, aging, and disposal (TAD) canisters. DOE has reevaluated the potential for repository accidents for this Repository SEIS. In addition, the Department has identified accident scenarios based on the current design and operating philosophy (1) to evaluate their impacts to support the application for construction authorization and (2) to assess whether the repository would comply with regulatory limits on radiation exposure to workers

and the public from accidental releases of radionuclides. *To meet licensing requirements, the results from the accident analysis will be more specific and comprehensive than those in this appendix and they will reflect a more fully developed repository design and operational details*. [italics added] To be consistent with the current design and operating philosophy, DOE revised the Yucca Mountain FEIS accident analyses, which now reflect the data and accident modeling changes."

Thus it appears that DOE has revised the analyses for the repository beyond that reported in the DSEIS. If so, that information is required before the work can be evaluated. In addition, there are a number of places in Appendix E, where DOE claims redesign will eliminate risk; a method to track this later to ensure that it is accomplished would increase confidence that this is the case. Some of these claims seem to assume that once a policy or procedure is in place, no one will ever violate it intentionally or accidentally. For example, a flight-restricted airspace around the repository does not ensure any aircraft with or without weapons will fly there; it simply reduces the likelihood of such an event.

In addition, decreases in risk are not fully explained in the DSEIS, although increases are. Risk calculations use simplified average techniques that might not properly represent the risk in populated vs. open country. Some methods, for example, human reliability analysis, may not be appropriate for processing facility applications. Further, it is unclear how the median total dose was determined in Section F.4.3. Section 4.2.1.2 notes that the dose under the igneous intrusion scenario has increased from the FEIS but there is limited discussion and no documentation as to the reduction of the dose under the extrusive scenario.

The treatment of scenarios in the repository does not appear to include possible human interactions and errors. Experience in other hazardous material processing facilities (for example, the U.S. Army's chemical weapons destruction program) has demonstrated problems with remote handling equipment that have required human intervention and maintenance and, during restoration from such intervention, errors have led to accidents and serious events. No descriptions of such considerations have been provided.

Response

At the time DOE prepared the Draft Repository SEIS, accident analyses were not complete. Appendix E of this Final SEIS discusses these analyses, which are now complete. The results incorporate the results of the repository accident analyses that serve as a basis for DOE's application for construction authorization.

DOE has used risk assessment methods well accepted by the risk assessment technical community, including the NRC. DOE based the risk assessments in the SEIS on approaches for evaluating scenarios that could affect an engineered structure. Appendix E, Section E.2 of the SEIS describes these fault tree approaches, which consider uncertainty. Uncertainties are generally accounted for by the use of conservative assumptions that bound the results. The use of representative scenarios is appropriate provided the analysis addresses potential consequences. The criteria DOE used to evaluate impacts are from EPA and NRC regulations.

The accident scenarios incorporate human error by including human error contributions to the failure modes. For example, the analysis based the failure rate of handling equipment (cranes, etc.) leading to drops on data that include human error contributions. Many of the analyzed accidents involve drops of waste containers or drops of equipment on the containers.

1.7.15 (3195)

Comment - RRR000121 / 0017

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

- Impacts to lands held in trust for the tribe that may be damaged by transportation accident or an accident at the proposed Yucca Mountain site;
- Impacts to land outside the reservation boundaries arising from a congressionally ratified treaty may be damaged by transportation accident or an accident at the proposed Yucca Mountain site;
- Impact to extant cultural relationship to land outside of the reservation boundaries that may be removed from use and access by transportation accident or accident at the proposed Yucca Mountain Site.
- Impacts to lands held in trust for tribe that may be damaged or made uninhabitable by a transportation accident or accident at the proposed Yucca Mountain site;
- Damage to the health of tribal members from possible exposure to radiation through exposure pathways unique to tribal lifestyle from an accidental release in transportation or at the proposed Yucca Mountain site;
- Involuntary tribal community risk from radiological accident in transportation of nuclear waste by highway or rail.

Response

Section 4.1.8 and Appendix E of this Repository SEIS discuss health impacts from repository accidents and a potential sabotage event. Section 6.4.1.11 of the SEIS discusses health impacts from transportation accidents and a potential transportation sabotage event in Nevada. These results show that accidents resulting in a release of radioactivity have low probabilities and the health impacts to the general public, including tribal members, would be small.

If there was a transportation accident, there would be no release of radioactive material from the transportation cask in 99.99 percent of accidents; in only 1 out of 10,000 accidents would a release of radioactive material from a transportation cask occur. Therefore, it is likely that there would be no impacts to tribal lands or tribal members from a transportation accident.

1.7.15 (3738)

Comment - RRR000317 / 0011

The Study fails to address the fact that the Caliente Rail Alignment will result in all toxic, high-level radioactive materials to be transported on the proposed DOE railroad to enter the Colorado River drainage tributary to the lower Colorado River. The lower Colorado River is the drinking water supply for 20+ million people from San Diego to Orange County to Los Angeles, and from Phoenix to Tucson, and in Las Vegas, with additional persons relying on Colorado River water located in Mexico. It is also the

irrigation supply for over 1 million acres of prime farmland. The Study includes no consideration or statement as to the potential risks to and effects on the Colorado River, its flora and fauna, people, cities, settlements and farms, or its potential effects on Mexico, or implications for U.S. treaty obligations to Mexico. It is important to keep in mind that both the Mina Rail Alignment and Carlin Rail Alignment, for example, do not involve bringing all such toxic, high-level radioactive materials into the Colorado River drainage.

Response

The Repository EIS does not specifically analyze a transportation accident involving contamination of surface water or groundwater. Analyses in previous EISs 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, all) showed that the impacts of the water contamination scenario were about one-fiftieth of the impacts of a comparable accident in an urban area.

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

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as many risk assessments, such as the impact analyses in Chapter 6 and Appendix G of this Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). DOE estimated the potential impacts using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, the U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

1.7.15 (3785)

Comment - RRR000549 / 0006

The commenter stated that the Draft Repository SEIS does not consider worst-case scenarios or accidents and underestimates the consequences of severe accidents involving long-duration fires.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Sections 6.3.3.2 and G.7

of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accidents" DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

1.7.15 (3907)

Comment - RRR000239 / 0006

The Draft SEIS does not consider "worst-case" accidents in its NEPA analysis because such combinations of factors were considered "not reasonably foreseeable." Yet, the Draft SEIS acknowledges that clean-up costs after a very severe transportation incident involving a repository shipment resulting in the release of radioactive material could range from $300,000 to $10 billion. The Final SEIS should evaluate the impacts from a credible worst-case transportation accident or terrorist attack, as well as other accidents scenarios caused by human error.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As discussed in Sections 6.3.3.2 and G.7 of the SEIS, however, DOE has evaluated "maximum reasonably foreseeable accident." DOE based the analysis of severe accidents on the 20 rail accident severity categories in Sprung et al. (DIRS 152476-Sprung et al. 2000, pp. 7-73 and 7-76). Many of these scenarios involved long-duration fires or exceeded the cask performance standards. The estimated consequences of the maximum reasonably foreseeable transportation accident would be 0.012 latent cancer fatality for the population in rural areas and 9.4 latent cancer fatalities for the population in urban areas.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

DOE has updated Appendix G, Section G.9.6 of the SEIS to provide a more-in-depth discussion of human error.

1.7.15 (3993)

Comment - RRR000071 / 0004

The commenter expressed concern about the risks of biological and environmental contamination associated with the off- and onsite packaging and unpackaging of spent nuclear fuel, and the transportation of those fuels to the proposed repository. The commenter noted that the Draft Repository SEIS specifies how to minimize potential accidents or events, but not how to deal with them if they occur along the proposed transportation routes, and that the SEIS does not guarantee that emergency management would be either swift or effectively coordinated between the various agencies and the public.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as many risk assessments, such as the impact analyses in Chapter 6 and Appendix G of the Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). DOE estimated the potential impacts using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, the U.S. Department of Energy, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

Appendix H.6 of the SEIS discusses emergency response and preparedness procedures and protocols and the roles and responsibilities of emergency responders in federal, state, and local levels.

1.7.15 (3994)

Comment - RRR000091 / 0005

The commenter stated Death Valley is a major tourist stop and supplies a lot of tax money to Inyo County. If there is an “upset” in a trucking campaign up through Death Valley, the economic impacts to Inyo County will be significant and could “break” the county.

Response

The representative truck routes that DOE presented in the Repository SEIS follow U.S. Department of Transportation routing regulations (49 CFR 397, Part D) for Highway Route-Controlled Quantities of radioactive material, which limit shipments to preferred routes such as Interstate Highways and bypasses and beltways around cities. DOE does not intend to use State Route 127 through Death Valley unless the State of California designates it as an alternate preferred route.

1.7.15 (4054)

Comment - RRR000212 / 0002

The commenter asked what is the probability (not possibility) of anything going wrong at Yucca Mountain, on a scale of 1 to 100, where 1 is a massive radiation leak.

Response

Appendix E of the Repository SEIS discusses the probability of accidents at the repository and the consequences of such accidents in terms of radiation doses. The accident probabilities range from 0.006 to less than 0.000002 per year. Estimated doses from such accidents would be well within NRC limits as specified in 10 CFR Part 63.

1.7.15 (4056)

Comment - RRR000270 / 0002

The commenter noted the current and increasing population of Clark County, Nevada, and asserted that because the draft Repository SEIS does not address worst-case scenarios, it has greatly underestimated potential consequences of both accidental and intentional incidents that could occur during rail and highway transportation of spent nuclear fuel and high-level radioactive waste. The commenter further noted that the City of Las Vegas has 250,000 visitors on any given day, and that the draft Repository EIS might not adequately address impacts to airport operations in case of a transportation incident.

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as many risk assessments, such as the impact analyses in Chapter 6 and Appendix G of this Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). DOE estimated the potential impacts using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, the U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the Repository SEIS analytical results.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

1.7.15 (4058)

Comment - RRR000479 / 0007

The commenter stated that by DOE's own analysis, there could be 150 to 400 accidents over the 20-to 30-year shipping period, depending on the method of transportation and routing, that many people could die or receive serious injuries, and cleanup would cost tens of billions of dollars and take months or years to complete. The commenter further stated that this does not include the millions to billions of dollars lost to the local economy from the effects of stigma.

Response

As demonstrated by the safety record of shipping spent nuclear fuel and high-level radioactive waste, as well as many risk assessments, such as the impact analyses in Chapter 6 and Appendix G of this Repository SEIS, and the results in Chapter 6 and Appendix J of the Yucca Mountain FEIS, spent nuclear fuel and high-level radioactive waste can be safely transported to Yucca Mountain. The National Academy of Sciences in its report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-National Research Council 2006, all), reached the same conclusion.

The analysis in the SEIS includes the characteristics of spent nuclear fuel and high-level radioactive waste, the integrity of the shipping casks DOE would use for transportation, and the regulatory and programmatic controls on shipping operations (see Appendix H). DOE estimated the potential impacts using widely accepted analytical tools, the latest reasonably available information, and cautious but reasonable assumptions. In addition, many technical and scientific studies performed over decades of research and development by DOE, NRC, the U.S. Department of Transportation, and the International Atomic Energy Agency and others in the international community support the SEIS analytical results.

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

For perspective, the current insured limit of responsibility for an accident that involves releases of radioactive materials to the environment is $10.26 billion (see Section H.9.2 of the SEIS).

Chapter 2, Section 2.4.4 of the SEIS discusses perceived risk and stigma.

1.7.15 (4143)

Comment - RRR000524 / 0027

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

Potential Accidents during Repository Operations

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

  The draft SEIS addresses airborne activity releases by radionuclide for drops of commercial spent nuclear fuel, naval spent fuel, and high-level waste glass, but does not address DOE-owned spent

nuclear fuel. Although section E.2.1.1 states that a safety strategy would preclude a breach of DOE canisters, it is not clear why this statement bounds potential impacts associated with DOE-owned spent nuclear fuel.

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

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

Response

DOE designed the repository surface facilities so waste handling operations for spent nuclear fuel or high-level waste would occur remotely. Nonremote waste handling operations would occur only for low-level radioactive waste, and most accidents involving this material would be unlikely to exceed normal operational doses. For serious accidents involving low-level waste (seismic event and fire), Appendix E, Section E.4.2 of this Repository SEIS discusses doses to workers at a distance of 60 meters.

In addition to the data in NUREG-1774 involving heavy lifts with cranes, DOE examined extensive nuclear power plant data involving drops of individual fuel assemblies at nuclear power plants. The drop rates for the individual fuel assemblies were similar to the heavy lift drop rates. Accordingly, the heavy lift drop rate was used for all lifts. *Yucca Mountain Critical Decision-1, Preliminary Hazards Analysis* (DIRS 176678-DOE 2006, Section 4.4.2) contains details of the drop rate assessments.

A drop during preclosure operations would be the most severe challenge identified for DOE Standardized canisters. Based on extensive analysis and testing, DOE has determined that breach (release of radioactive material) of a DOE Standardized canister due to a drop is a Beyond-Category-2 event and would be unlikely to produce large consequences; therefore, it does not require analysis (see Appendix E, Sections E.2.1.1 and E.2.1.1.7).

Analysis of seismic events is in the report *Seismic Event Sequence Quantification and Categorization* (DIRS 183621-BSC 2008, all), which was prepared after publication of the Draft Repository SEIS. This report shows that seismic events with potentially significant consequences are low-probability events (Beyond Category 2). Appendix E, Section E.2.1.2.2 of the SEIS discusses this issue.

Appendix E of the Repository SEIS does not indicate that the aircraft crash bounds impacts. As indicated in Section E.2.1.2.1, DOE determined that the probability of an accidental aircraft crash on vulnerable repository surface facilities was below the probability threshold for impact analysis based on its interpretation of NEPA. However, DOE did select the aircraft crash event as a representative sabotage event. The analysis assumed the aircraft crash would penetrate the waste handling building with the largest inventory of radioactive material vulnerable to damage, resulting in a loss of confinement capability for the building. It also assumed that the event would result in a fire that converted the spent nuclear fuel to a powder form more readily dispersed to the atmosphere.

1.7.16 Sabotage and Terrorism

1.7.16 (4233)

Comment - 30 comments summarized

Repository and Transportation Sabotage

The commenters expressed concern about sabotage and terrorism at the repository and during transportation.

Response

Whether acts of sabotage or terrorism would occur, and the exact nature and location of the events or the magnitude of the consequences of such acts if they were to occur, is inherently uncertain-the possibilities are infinite. Nevertheless, the Yucca Mountain FEIS and, consistent with Departmental guidance (DIRS 172283-DOE 2002, all), this Repository SEIS took a hard look at the consequences of potential acts of sabotage or terrorism. This included evaluating scenarios at the repository, where DOE performed a comprehensive analysis to determine the largest inventory of radioactive material vulnerable to damage in a potential sabotage event, and analyzed a scenario in which a large commercial aircraft would crash into and penetrate the repository facility. For transportation, DOE evaluated two fundamentally different scenarios: one involving aircraft and one involving a weapon or device that struck a shipping cask loaded with commercial spent nuclear fuel. DOE estimated the consequences of these scenarios without regard to their probability of occurrence; that is, DOE assumed the scenarios would occur and under conditions that would reasonably maximize the consequences.

Appendix E, Section E.7 of the Repository SEIS discusses security at the repository. Over the long term (after closure), deep geologic disposal of spent nuclear fuel and high-level radioactive waste would provide optimal security by emplacing the material in a geologic formation that would provide protection from inadvertent and advertent human intrusion, including potential terrorist activities. The use of robust metal waste packages to contain the spent nuclear fuel and high-level radioactive waste more than 200 meters (660 feet) below the surface would offer significant impediments to an attempt to retrieve or otherwise disturb the emplaced materials.

In the short term (before closure), the proposed repository at Yucca Mountain would offer certain unique features from a safeguards perspective: a remote location, restricted access afforded by federal land ownership and proximity to the Nevada Test Site, restricted airspace above the site, and access to a highly effective rapid-response security force.

Excavation of emplaced materials after closure of a repository would take approximately the same level of effort it has taken DOE to excavate the current Exploratory Studies Facility. In other words, it would take years with sophisticated excavation equipment, a large workforce, and significant expenditure of funds - all unlikely to happen without being highly visible to the Government and the public. For this reason, it is unlikely that such activity would ever take place. Even if terrorists were able to penetrate to repository depth, the spent nuclear fuel and high-level radioactive waste would be in waste packages weighing between 32 and 82 metric tons (35 and 90 tons), each made of thick solid metal (stainless steel and Alloy-22). Without the ventilation systems and remotely operated emplacement equipment used for handling of the waste packages, potential terrorists probably would not survive the high temperatures and high radiation fields that would exist. Therefore, it is unlikely that terrorists could remove or cause major damage to a waste package.

The repository would also not be an attractive target for saboteurs during operation. Based on experience at other DOE facilities, sabotage attempts would be unlikely. Furthermore, DOE intends to meet or exceed the requirements contained in Nuclear Regulatory Commission regulations that require the protection of spent nuclear fuel and high-level radioactive waste from radiological sabotage. These regulations are in 10 CFR 73, Physical Protection of Plants and Materials, and cover the protection of facilities such as the repository and also cover transportation.

Chapter 4, Section 4.1.8.4 of the Repository SEIS discusses the consequences of sabotage events involving the repository. DOE performed a comprehensive analysis of the radioactive material contained in various facilities at the repository, such as the Receipt Facility, the Initial Handling Facility, the Wet Handling Facility, and the Cask Closure and Receipt Facility, to determine the largest inventory of radioactive material that would be vulnerable to damage in a potential sabotage event. DOE then analyzed a hypothetical scenario in which a large commercial aircraft would crash into and penetrate this facility. The consequences associated with this event were estimated to be 5.9 latent cancer fatalities for the population surrounding the repository.

Transportation security is discussed in Appendix H, Section H.8 of the SEIS. Transportation safeguards and security are among the highest DOE priorities as it plans for shipments of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. DOE would build the security program for the shipments on the successful security program it developed and has successfully used in past decades for shipments of spent nuclear fuel to DOE facilities from foreign and domestic reactors.

An effective security program must protect members of the public near transportation routes as well as minimize potential threats to workers, and it must include security elements appropriate to each phase of transportation. DOE would continually test security procedures to identify improvements in the security system throughout transportation operations. The key elements of a secure transportation program include physical security systems, information security, materials control and accounting, personnel security, security program management, and emergency response capabilities.

DOE is working closely with other federal agencies including NRC and the Department of Homeland Security to understand and mitigate potential threats to shipments. In addition to domestic efforts, the Department is a member of the International Working Group on Sabotage for Transport and Storage Casks, which investigates the consequences of a potential act of sabotage and explores opportunities to enhance the physical protection of casks. As a result of these efforts, DOE would modify its methods and systems as appropriate between now and the time of shipments.

In coordination with other federal agencies, DOE is working with other stakeholders including state, local, and tribal governments; industry associations such as the Association of American Railroads, and technical advisory and oversight organizations such as the National Academies of Science and the Nuclear Waste Technical Review Board. This enables DOE to take advantage of the experience and practical recommendations of experts on a broad range of security-related technical, procedural, and operational matters.

Section 6.3.4 of the SEIS presents the consequences of transportation sabotage events. The consequences of sabotage events involving a truck cask were estimated to be 0.055 latent cancer fatalities for the population in rural areas or 28 latent cancer fatalities for the population in urban areas. The consequences of sabotage events involving a rail cask were estimated to be 0.029 latent cancer fatalities for the population in rural areas or 19 latent cancer fatalities for the population in urban areas.

As is discussed in the Repository SEIS, when transported, spent nuclear fuel and high-level radioactive waste, which are hazardous materials, would be in robust transportation casks, which would be designed, manufactured, tested, certified and operated in accordance with NRC regulations (10 CFR Part 71). Many tests, analyses, and demonstrations in the United States and abroad have demonstrated the extraordinary performance of shipping casks that comply with these regulatory requirements. The requirements are rigorous because the casks are the primary systems in transportation for containing the hazardous spent nuclear fuel or high-level radioactive waste and for protecting the health and safety of members of the public from the hazardous effects of radiation that the materials emit. The same features that protected the public from spent nuclear fuel and high-level radioactive waste during a transportation accident would provide some protection during a terrorist attack, but this is not to say that the casks are impenetrable.

DOE has updated Appendix G, Section G.9.6 of the Repository SEIS to provide a more-in-depth discussion of human error.

DOE has modified Chapter 6, Section 6.3.4 of the SEIS to discuss opposing viewpoints related to sabotage and terrorism. As discussed in Section 6.3.4, DOE has taken a hard look at the consequences of acts of sabotage or terrorism during the transport of spent nuclear fuel and high-level radioactive waste. Further speculation about scenarios that could produce consequences "worse" than those previously estimated would be unproductive and ineffective, breeding endless hypothesis and speculation, and crafting and analysis of scenarios would be based on pure conjecture and would not be supported by credible scientific evidence. This includes evaluating potential sabotage events at specific locations.

DOE has updated Appendix G, Section G.9.8 to include a discussion of the consequences of the maximum reasonably foreseeable transportation accident in specific urban locations.

1.7.16 (4234)

Comment - 8 comments summarized

Use of Conservative Assumptions

The commenters pointed out instances where conservative assumptions had been used, which would overestimate impacts.

Response

DOE acknowledges the use of conservative assumptions throughout the Repository SEIS. In many instances, the assumptions DOE used for the analysis of health and safety impacts from the repository are consistent with those it is using to support analyses for the application for a license to construct the repository. A reason to use conservative assumptions in impact analyses, including transportation analyses, is to not underestimate impacts. On the other hand, the Department has attempted to not be overly conservative. DOE reviewed each of the specific instances mentioned in the comment where its analyses were reportedly overly conservative. In many instances, the Department added explanatory text to provide a perspective of the conservatisms and the effects that a more reasonable assumption might have on the presented results. The Department added several text boxes to Chapter 6 of the Repository SEIS to provide a balanced perspective to the opposing viewpoints of the State of Nevada, which present the State's position that the analyses are not conservative enough.

1.7.16 (619)

Comment - RRR000025 / 0004

The commenter suggested that the Draft Repository SEIS analysis of potential terrorist scenarios was inadequate because it relied on a restricted airspace above the repository and did not consider ground penetrating weapons.

Response

The restricted airspace was an analytical assumption DOE used to evaluate the probability of an aircraft crash into repository facilities. The Department would not operate the repository unless the airspace restrictions were in place. DOE did evaluate the impacts of an aircraft crash into the repository as a sabotage event (see Appendix E, Section E.7). The several hundred feet of rock overburden would protect the waste packages from ground penetrating weapons.

1.7.16 (623)

Comment - RRR000025 / 0008

The commenter recommended a major evaluation of the vulnerability of the nuclear fuel cycle to terrorism.

Response

A major evaluation of the vulnerability of the nuclear fuel cycle to terrorism is beyond the scope of the Repository SEIS. Appendix E, Section E.7 of the SEIS discusses the security measures DOE would use at the repository, and Appendix H, Section H.8 discusses transportation security.

1.7.16 (1689)

Comment - RRR000836 / 0009

The worst case scenario which is unaddressed, should be included as one of the action alternatives. To say that the possibility is “not reasonably foreseeable” is unscientific without a reasonable probability factor for examination. Probability statistics should be presented for all decisions, for example, terrorist attack, and in all possible scenarios which have not been enumerated. The waste will be dangerous for thousands of years. How will conditions be modified to account for different threat scenarios due changes in technology?

What statistical probability of risk is acceptable to you? In other words, what probability of a “worst case scenario” event is acceptable to you? How many deaths or serious health impacts are acceptable in a worst case scenario?

Response

NEPA does not require an analysis of worst-case scenarios because consideration of such highly improbable events is not a reasoned basis for decisionmaking. Whether acts of sabotage or terrorism would occur, and the exact nature and location of the events or the magnitude of the consequences of such acts if they were to occur, is inherently uncertain—the possibilities are infinite. Nevertheless, the Yucca Mountain FEIS and, consistent with Departmental guidance (DIRS 172283-DOE 2002, all), this Repository SEIS took a hard look at the consequences of potential acts of sabotage or terrorism, both at the repository and during transportation. DOE estimated the consequences of these potential acts of sabotage or terrorism without regard to their probability of occurrence; that is, DOE assumed the potential

acts of sabotage or terrorism would occur and under conditions that would reasonably maximize the consequences.

1.7.16 (2163)

Comment - RRR000659 / 0006

DOE has not sufficiently analyzed the economic consequences of sabotage in a populated area. The hundreds of trains and trucks passing through heavily populated areas of California—which would be increased if the Mina route is selected—contain sufficient radioactive material to create great economic and environmental harm to those communities if terrorists were successful in releasing only a small portion of their contents. DOE fails to analyze any effects from a successful act of sabotage other than the number of latent cancers produced. The Draft Repository SEIS (Section G.10.7 of Appendix G) discusses the costs of cleaning up after a radioactive waste transportation accident as being only "a few million dollars" or possibly "10 times greater" for a presumed maximum release of 30 curies of radiation. (Draft Repository SEIS p. G-54.) DOE'S cleanup cost estimates may be too low. The State of Nevada estimates that transportation accident cleanup costs could be in the low hundreds of billions of dollars. (Draft Repository SEIS p. G-54.) A report from the Pentagon's National Defense University concluded that a "dirty bomb" attack on a major metropolitan area could require a clean up at least as expensive as the tens of billions of dollars required to return lower Manhattan to its pre-September 11, 2001, condition. [footnote 5] Also, while DOE assumes that the maximum release from a transportation accident would be 30 curies of radiation, each rail cask will carry 5.3 million curies of radiation. The enormous amount of radiation contained in each cask raises the possibility that saboteurs who designed an attack specifically to release radioactive material from a cask may succeed in releasing far more than 30 curies (0.0006 percent of the total contents). DOE seeks to put its "few million dollars" cleanup number in "perspective" by comparing it to the $10.62 billion insured liability under the *Price-Anderson Act*. (Draft Repository SEIS p. G-54.) Appendix section H.9 also points out that "The Price Anderson Act provides indemnification for liability for nuclear incidents that apply to the proposed Yucca Mountain repository." (Draft Repository SEIS p. H-19.) An act of sabotage that causes a release of radioactive material may not be covered by any form of insurance at all, however, leaving state and local governments or the victims themselves with the enormous expenses of decontamination and recovery. "Claims arising out of an act of war" are excluded from coverage under the *Price-Anderson Act*, and it is unclear whether an attack by a foreign terrorist group would be considered an excluded "act of war." (See 42 U.S.C.& 2014 (w)(ii).) In addition, acts of terrorism are very often specifically excluded from homeowners and commercial insurance policies. While the *Price-Anderson Act* might provide the hundreds of millions of dollars that might be required to clean up an accident, it is far from certain who would supply the hundreds of millions of dollars needed to clean up after a sabotage incident of equal proportions.

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Footnote 5 - Zimmmerman, Peter D. & Loeb, Cheryl, "Dirty Bombs: The Threat Revisited," Defense Horizons, No. 38 (Center for Technology and National Security Policy, National Defense University, January 2004) at p. 9.

Response

Appendix G, Section G.9.7 of the Repository SEIS discusses the costs of cleanup. The costs of cleanup after a severe transportation accident in which radioactive material was released could be in the range of $300,000 to $10 billion. The $10 billion cost was not based on a truck or rail accident, but rather was based on a National Aeronautics and Space Administration study of potential reentry accidents for the

Cassini mission, which used a plutonium powered electricity generator. The wide range in costs reflects, among other things: (1) the severity of the assumed accident and resulting contamination levels, (2) accident location and use of affected land areas, (3) meteorological conditions, (4) cleanup levels and decontamination methods, and (5) disposal of contaminated materials.

For perspective, the current insured limit of responsibility for an accident that involved releases of radioactive materials to the environment is $10.26 billion (Appendix H, Section H.9.2 of the SEIS).

1.7.16 (2367)

Comment - RRR000681 / 0024

Only one sabotage scenario has been considered. This is not consistent with current approaches to physical protection and sabotage/terrorism analyses. For example, the DOE's own methodology for physical protection of Gen-IV nuclear energy systems asks analysts to consider a wide range of threats and strategies and develop thorough description of attack scenarios and release pathways. The DOE's "representative scenario" employs an aircraft penetrating the roof of the building. There is no way to be sure that this is in any way a bounding analysis. For example, other modes of attack using weapons in the receiving areas might be of interest. We agree with the authors of the National Research Council's review of the transportation problem, when they said "Malevolent acts against spent fuel and high-level waste shipments are a major technical and societal concern... [and that]...an independent examination of the security of spent fuel and high-level waste transportation be carried out prior to the commencement of fuel and high level waste transportation...." Information released by the RAND Center for Terrorism Risk Management Policy in 2007 should be considered when assessing risks related to terrorism or sabotage. The RAND report was commissioned by the U.S. Department of Homeland Security to explore how risk analysis tools might be useful. The Probabilistic Terrorism Model discussed in the report analysis provides relevant findings for not only Clark County, but for other jurisdictions across the country. The report states, in part: "Terrorism risk is highly concentrated, with eight cities carrying 95% of the total risk: New York, Chicago, Washington DC, San Francisco, Los Angeles, Boston, Houston, and Philadelphia (p.18). "Though Las Vegas is estimated to have the ninth highest overall attack likelihood, Las Vegas" position is lower (16th) in terms of population and property value -- factors for which Las Vegas is exceeded by larger, higher density urban areas." (p. 18). This ranking disparity is directly reflective of the fact that RMS model only considers employees of a hotel/casino in the fatality estimates, and does not include the guests and visitors, under-representing the population density of the tourist corridor." estimated fatality risk shares. This is because risk estimates reflect both likelihood and consequence, and therefore account for the density and amount of surrounding The RAND report classifies Las Vegas as a "Tier 3 target using its model, placing it among the top 10 cities in the country likely to be attacked. The report states, "Las Vegas stands out in having a high proportion of high-likelihood targets compared to the nation as a whole." The RAND report well describes and validates the high ranking for risk of terrorist attack, and acknowledges that both risk and population density are underestimated given the unique nature of Las Vegas, especially with its recognized "iconic value" as a terrorist target; the SDEIS falls short in capturing this potential impact. The report also highlights the importance of the high property values on the Las Vegas Strip, which increases both risks and consequences. The RAND report findings should be incorporated into the final EIS documents.

Response

Whether acts of sabotage or terrorism would occur, and the exact nature and location of the events or the magnitude of the consequences of such acts if they were to occur, is inherently uncertain - the possibilities are infinite. Nevertheless, the Yucca Mountain FEIS and, consistent with Departmental guidance (DIRS

172283-DOE 2002, all), this Repository SEIS took a hard look at the consequences of potential acts of sabotage or terrorism. This included evaluating scenarios at the repository, where DOE performed a comprehensive analysis to determine the largest inventory of radioactive material vulnerable to damage in a potential sabotage event, and analyzed a scenario in which a large commercial aircraft would crash into and penetrate the repository facility. For transportation, DOE evaluated two fundamentally different scenarios: one involving aircraft and one involving a weapon or device that struck a shipping cask loaded with commercial spent nuclear fuel. DOE estimated the consequences of these scenarios without regard to their probability of occurrence; that is, DOE assumed the scenarios would occur and under conditions that would reasonably maximize the consequences.

Appendix H, Section H.10 of the Repository SEIS discusses the findings and recommendations of the National Academy of Sciences report, *Going the Distance: The Safe Transport of Spent Nuclear Fuel and High-Level Waste in the United States* (DIRS 182032-NRC 2006, all). Section H.10.1 discusses DOE positions on, or approaches to, aspects of the specific finding and recommendation mentioned by the commenter.

The Probabilistic Terrorism Model discussed by the commenter is used routinely by the insurance industry to assess liability from terrorism risk. In contrast, DOE estimated the consequences of potential sabotage scenarios without regard to their probability of occurrence; that is, DOE assumed the scenarios would occur and under conditions that would reasonably maximize the consequences. In addition, as discussed in Chapter 6, Section 6.1.5, DOE included Las Vegas resident and tourist populations in the urban population density used to estimate the consequences of potential sabotage events.

1.7.16 (2946)

Comment - RRR000688 / 0012

The commenter expressed concern about the 50 years of active ventilation and the vents being sabotaged or plugged from an accident. She asked what the “actual emergency plan” is.

Response

Plugging of the vents would result in a very gradual increase in the temperature of the waste packages, which would allow ample time to restore the ventilation before a significant radioactive release could occur. DOE would develop an emergency response plan before the repository began operations and would comply with Departmental and NRC requirements for responding to emergencies.

1.7.16 (3470)

Comment - RRR000929 / 0006

The commenter noted that the NRC recently published draft proposed security requirements for the repository. She stated that, because these requirements have not been set, the Repository SEIS analysis of security was inadequate.

Response

DOE would meet or exceed all NRC security requirements in effect at the time the repository began operations.

1.7.17 Manufacturing Repository Components

1.7.17 (2760)

Comment - RRR000688 / 0051

The commenter requested that DOE consider the use of titanium in the future to be unrealistic.

Response

The world market for titanium will support the proposed need at Yucca Mountain. Section 4.1.14.5.4 of the Repository SEIS compares the project's estimated demand for titanium with current production rates. The conclusion from this comparison is that, on a yearly basis, the amount of titanium necessary for the future manufacture of drip shields would be a significant portion of the titanium currently used in a year in the United States. However, producers of titanium are adding capacity due to an increasing demand in the world market. Once repository operations started, there would be a 90-year lead time before titanium drip shields would be necessary. Thus, there would be sufficient time for U.S. and world markets to increase titanium production capabilities to meet repository construction needs.

1.7.17 (4145)

Comment - RRR000677 / 0023

DOE also foresees no difficulty in procuring adequate supplies of stainless steel, nickel based alloy, carbon steel, and titanium ... to manufacture over:

- 11,200 waste packages (outer shell of nickel based alloy and inner shell of stainless steel);
- 7,400 TAD stainless steel canisters;
- 11,200 nickel based alloy and stainless steel emplacement pallets;
- 11,500 titanium drip shields;
- 2,500 aging overpacks (carbon steel and concrete);
- 10 shielded stainless steel transfer casks; and
- 109 stainless or carbon steel shipping casks (79 rail and 30 truck).

See SEIS at 4-95 to 104. DOE fails to meet the requirement of NEPA because it does not discuss the regional or national economic impacts from the material and supplies needed and consumed at the Yucca Mountain repository.

Response

The evaluation of the manufacture of repository components described in Section 4.1.14 of the Repository SEIS includes estimates of socioeconomic impacts to the location of a typical manufacturing facility and evaluations of other indicators of potential environmental impacts, including air emissions, health and safety, and waste generation. For impacts associated with the raw materials that would be necessary to manufacture the components, DOE performed evaluations (see Section 4.1.14.5 of the SEIS) by comparing the amounts of required materials to the amounts currently produced or imported into the United States. If the needed materials were only a small percentage of the quantity already produced or imported in the United States, economic impacts from the additional demand would be minor. It might be argued that the identified materials of manufacture are world-wide market items and that comparisons to world markets would be more appropriate, but in the SEIS DOE choose the more conservative comparisons associated with the U.S. market.

In the case of nickel, palladium, and titanium, DOE identified the quantities of these materials that would be necessary for repository components as potential concerns and, as a result, discussed additional factors that basically indicated the availability of these items in the U.S. market was higher than the first number evaluated or were increasing and, thus, the amount needed for repository components was a smaller percentage.

The scope of the evaluation was reasonable and meets NEPA requirements. However, this comment response contains additional information. The market for all these materials, and particularly for nickel, palladium, and titanium, are worldwide and DOE would put the manufacture of repository components out to the market for competitive bidding. The Department cannot estimate from where they would come. Similarly, DOE cannot evaluate potential economic impacts to specific locations in the world that could be involved in supplying raw materials because it cannot identify those locations. It can only compare the project's material needs to the U.S. and world markets' ability to satisfy those needs and show them to be a relatively minor addition.

In its "Mineral Commodity Summaries 2008" (DIRS 185186-USGS 2008, all), the U.S. Geological Survey has compiled recent information on the production and distribution of nickel, palladium, and titanium as well as many other mineral commodities. Unless noted otherwise, the values in this paragraph come from the Survey reference. Table 4-36 of the SEIS, compares DOE's estimated demands for nickel and titanium to the amount of these materials imported into the United States; the amounts of these materials actually produced in the United States are very small. The United States had no active nickel mines in 2007, though some byproduct nickel was recovered from other mined ores in the west. The United States mined an estimated 300,000 metric tons of titanium dioxide in 2007, but pigment producers consumed essentially all (94 percent) of this material; very little went to the production of titanium metal. Domestic production numbers are available for palladium, but they are very small (13.5 metric tons in 2007), and the estimated demand for the repository project (8 metric tons per year during the production of drip shields) represents a large percentage (59 percent) of the annual domestic production.

Based on this information, the economic impact of the DOE demand for these materials would be on the world market. For comparison, world mine production of nickel in 2007 was about 1,660,000 metric tons; DOE's demand for 5,000 metric tons per year (see Table 4-36 of Section 4.1.14.5.4) would be about 0.3 percent of this value. World production of palladium in 2007 was about 232 metric tons; DOE's demand for 8 metric tons per year (see Table 4-36 of Section 4.1.14.5.4) would be about 3.4 percent of this value. The world mine production of titanium dioxide was about 6,100,000 metric tons in 2007; this represents about 3,650,000 metric tons of titanium compared to the DOE need for 5,400 metric tons per year (see Table 4-36 of the SEIS), or about 0.15 percent of the total. The United States currently imports these materials from a number of countries. About 76 percent of the imported nickel comes from Canada, Russia, Norway, and Australia and the other 24 percent comes from other countries. About 79 percent of the imported palladium comes from Russia, South Africa, and the United Kingdom. About 98 percent of the titanium sponge metal imported into the United States comes from Kazakhstan, Japan, Russia, and the Ukraine, and the actual mining of the ore was probably across a broader spectrum of countries. There is no practical way by which DOE could predict the specific location in the world from which these materials would come for the Proposed Action, let alone what type of economic impacts could result. However, in terms of the total world market the impacts would be small.

1.7.18 American Indian Perspectives

1.7.18 (450)

Comment - RRR000327 / 0001

[DOE should abide by the] Treaty of Ruby Valley

Response

An American Indian Writers Subgroup comprised of tribal representatives from Southern Paiute, Western Shoshone, and Owens Valley Paiute and Shoshone ethnic groups prepared an EIS reference document that presents culturally appropriate tribal perspectives on the Yucca Mountain site. DOE used that reference extensively in the Yucca Mountain FEIS and the recent Repository SEIS. The reference document also presents the Western Shoshone opinions and beliefs on the Ruby Valley Treaty of 1863, which is also acknowledged in the Repository SEIS. The Western Shoshone people maintain that the Ruby Valley Treaty gives them land rights to approximately one-third of the State of Nevada (including the Yucca Mountain region), along with portions of California, Utah, and Idaho. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury. DOE is aware that among the Native American community there is significant disagreement with the Court rulings.

1.7.18 (456)

Comment - RRR000276 / 0001

The commenter provided an American Indian perspective and history.

Response

DOE notes the commenter's views regarding American Indian perspectives and history.

1.7.18 (630)

Comment - RRR000283 / 0001

The commenter contended that the highly radioactive byproducts from nuclear reactors have the potential to destroy the ancestral lands of the Shoshone and Paiute Nations if DOE implemented its plans for a repository at Yucca Mountain.

Response

Thank you for your comment. DOE is very serious about its responsibility for ensuring the protection of the public health and safety and the environment while carrying out the mission of the proposed repository development at Yucca Mountain. Part of that responsibility is understanding the potential for radionuclide migration in the environment. During the construction, operations, monitoring, and closure analytical periods at Yucca Mountain, the only radionuclides likely to be released would be naturally occurring radon and radon decay products, and noble gases. Of these, only the naturally occurring radon decay products have the potential to accumulate in the environment, including native plants and wildlife that might live inside and outside the analyzed land withdrawal area and later are consumed by humans or

animals. These radionuclides are indistinguishable from the background radiation present in the soil around Yucca Mountain.

1.7.18 (676)

Comment - RRR000438 / 0001

The actions you are taking against the Shoshone can be construed as a form of Genocide.

Response

DOE respects Western Shoshone ethnic identity and understands that Shoshone and other American Indians consider the Yucca Mountain area, as well as all environmental resource areas, to be culturally significant to their religious and holistic beliefs. As part of the studies of Yucca Mountain, DOE maintains a formal interaction program with American Indians, which includes Western Shoshone tribes, to gather and document valuable cultural data for inclusion in project reports and consideration in the Repository SEIS. DOE recognizes that American Indians believe the construction and operation of a repository at Yucca Mountain would have continuing adverse impacts on a culturally important and sacred landscape. DOE will continue to interact with American Indians to ensure that such adverse effects are minimized to the fullest extent possible.

1.7.18 (1585)

Comment - RRR000690 / 0032

[There could be] potential impacts to the self-governance of the Timbisha Shoshone Tribe.

Response

It is not DOE's intent to affect the Timbisha Shoshone Tribe's process of self-governance. The Department understands that the U.S. Government has recognized the Tribe as a sovereign nation with all applicable rights. DOE has identified no impacts to the governing rights of the Tribe as part of its Repository SEIS evaluations.

1.7.18 (1588)

Comment - RRR000690 / 0029

[There could be] potential reduction in Western Shoshone people's use of land, plant and animal.

Response

DOE acknowledges in the SEIS that people from many American Indian 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. DOE does recognize that construction and operations of a repository at Yucca Mountain would have continuing adverse impacts for American Indians who view past, ongoing, and future repository-related activities as an intrusion on a culturally important and sacred landscape. DOE will continue to interact with Americans Indians to ensure that such adverse effects are minimized to the fullest extent possible.

1.7.18 (1590)

Comment - RRR000690 / 0027

Make fully available the American Indian Writers Subgroup (AIWS) article American Indian Perspectives on Proposed Rail Alignment.

Response

The American Indian Writers Subgroup document is an important reference for the Repository SEIS and DOE has cited it extensively. In addition, the document is a part of the DOE Administrative Record for the SEIS and is fully available at any time, as necessary.

1.7.18 (1599)

Comment - RRR000690 / 0024

Presently, the Tribe cannot support the SEIS's No-action alternative. Even with no action possible threats to indigenous peoples cultural resources, sacred sites and game and plant gathering areas may be realized. Moreover, many indigenous communities believe that lands presently under the jurisdiction of various federal agencies do not provide the level of preservation and protection that the YMP [Yucca Mountain Project] land use area may provide. The Tribe suggests that YMP continue to [do] its best to protect cultural resources, sacred sites, game and plant gathering areas in cooperation with various indigenous groups and organizations, including the Western Shoshone Nation and the Consolidated Groups of Tribes and Organizations.

Response

DOE acknowledges this comment opposing the No-Action Alternative.

1.7.18 (3968)

Comment - RRR000671 / 0008

The CGTO recommends that a listing of all reports associated with the YMP [Yucca Mountain Project] be provided along the corridor.

Response

DOE has listed the references cited in the Repository SEIS at the end of each chapter and appendix.

1.7.18 (4042)

Comment - RRR000671 / 0061

Page 2-79 2.4.3—Opposing View—The text provides a definition of opposing views and includes American Indian Tribes in the sources of information. It should be noted that not all comments received by Indian tribes including the CGTO were in opposition but requested clarification of information that was presented by the DOE. The text should be revised to delineate this fact so as not to mislead the readers and general public.

Response

The statement about American Indian tribes in Section 2.4.3 of the SEIS deal with reviewing sources of information to look for and document opposing viewpoints. DOE agrees that some comments were not in opposition.

1.7.18 (4125)

Comment - RRR000121 / 0003

What did not fit into the cultural study was deemed nonexistent and therefore not suitable for consideration by any means. This selective inattention produced outcomes that favored the DOE'S Yucca Mountain development objectives. For example, an examination of legal systems, property ownership and territorial sovereignty were not suitable yet, are the basis for continuing tribal custom, social cohesiveness and economic stability of Newe Sogobia. Erroneous assumptions of land ownership at Yucca Mountain by the DOE impact tribal society. Such neglect reflects an act of intent making tribal survival more difficult, restricting tribal ways of life, and strangling values tribal culture is built upon.

Response

The cultural resources program for the repository site consists of two components, archaeological studies and American Indian interactions and perspectives. DOE based the program on regulatory requirements of applicable federal and state agencies and is carrying it out in good faith. The Department is evaluating land at the proposed repository site, which is entirely under the control of the Federal Government, for the disposal of spent nuclear fuel and high-level radioactive waste under specific regulatory requirements. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury.

1.7.18.1 Perspective on Environmental Impacts

1.7.18.1 (1621)

Comment - RRR000690 / 0009

The SEIS is incomplete as it was presented with an incomplete depository design in addition to incomplete construction and operations plans. In addition, facility design and construction plans are not complete without the input of Native American persons or designers familiar with Native American construction or design concerns. The SEIS also does not fully analyze the following:

- Waste handling risk activities, specifically the models used to determine the thermal output of spent nuclear fuel
- Emplacement drift design and specifications
- Thermal energy studies which support the thermal out put of waste packages
- Heat transfer issues, specifically the anticipated steam associated with emplaced spent nuclear fuel. Does the steam actually move away from the steam bed? Do midpillar region temperatures actually maintain a temperature below the boiling point of water?
- Thermal Energy Density, the criteria upon which it is based, its scope or acceptable variances
- Emplacement steam water flow

- Seismic activity prone to the Yucca Mountain site which may weaken depository, depository support facility and emplacement drift structural integrity

Response

The suggestion that DOE must await the availability of additional, more detailed design and operational details is not consistent with the requirements of NEPA and Council on Environmental Quality regulations. DOE has used the best available information in this Repository SEIS to provide an analysis of the potential reasonably foreseeable environmental impacts of the Proposed Action. The policies and procedures of DOE and the Council that implement the requirements of NEPA call for environmental impact analyses early in the process of development of a proposed federal project. In particular, the need to prepare an EIS early in the process is stressed throughout Council regulations (40 CFR 1500.5, 1501.2, 1502.5, and 1508.23). In addition, there are processes for determining if there is a need for additional NEPA analyses if an agency proposes substantial changes to a proposed action, or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

This information is sufficient to perform an adequate and meaningful evaluation of the proposed project.

1.7.18.1 (1624)

Comment - RRR000690 / 0006

The YMP [Yucca Mountain Project] study area and nearby lands have significant cultural importance to the Timbisha Shoshone and to other indigenous peoples, which include the Timbisha Shoshone, which is a part of the Western Shoshone. These lands contain rich traditional religious, gathering and recreational areas that are life sustaining and lie at the core of indigenous life. In contrast, however, non-Indigenous peoples may view the proposed action lands as remote, low populated and barren, and a lifeless place, where a highly controversial project such as Yucca Mountain should be located. [These] contrasting perspectives lie at the core of the present controversy of the appropriateness of the YMP location and precisely why it is very important that before any proposed action move forward, that the indigenous peoples perspectives concerning the YMP site be fully evaluated, studied and documented. As of the date of these comments, the studies that have been conducted fail to include the complete indigenous perspective and it is recommended that the DOE thoroughly assess and fully fund any and all research documenting indigenous people's perspectives and concerns with the YMP.

All further studies, including geological, hydrological, ethnological, archeological, meteorological and volcanological should be conducted focusing on the indigenous persons point of view, which would assist the DOE to better understand the complex cultural perspectives of indigenous peoples. Likewise, scientific experts who have gained the trust of or who are highly familiar with indigenous peoples cultural perspectives, specifically, the perspectives and traditions of area indigenous peoples, should be utilized, again, to better develop the indigenous perspective to the project and proposed land use.

Response

DOE understands that the Yucca Mountain area has significant cultural importance to American Indians and specifically the Timbisha Shoshone. A Native American Interaction Program, in place since the late 1980s, has documented the ongoing tribal perspectives and cultural beliefs about the area. In addition, the Repository SEIS uses the American Indian Writers Subgroup document prepared for the Yucca Mountain FEIS as a reference for documenting tribal information for consideration. The level of detail of the information is adequate for environmental impact analyses. DOE will continue to document tribal

perspectives through an ongoing cultural resource study program and the Native American Interaction Program using applicable staff and subcontractor expertise, if necessary.

1.7.18.1 (2272)

Comment - RRR000769 / 0004

Commenter stated that the analysis of impacts to the Timbisha Shoshone Tribe was inadequate.

Response

DOE understands that the Yucca Mountain area has significant cultural importance to American Indians and specifically the Timbisha Shoshone. A Native American Interaction Program, in place since the late 1980s, has documented the ongoing tribal perspectives and cultural beliefs about the area. In addition, the Repository SEIS uses the American Indian Writers Subgroup document prepared for the Yucca Mountain Repository FEIS as a reference for documenting tribal information for consideration. The level of detail of the information is adequate for environmental impact analyses. DOE will continue to document tribal perspectives through an ongoing cultural resource study program and the Native American Interaction Program using applicable staff and subcontractor expertise, if necessary.

1.7.18.1 (2229)

Comment - RRR000623 / 0001

The commenter expressed general opposition to the Proposed Action from a tribal perspective.

Response

DOE acknowledges the commenter's general opposition.

1.7.18.1 (2674)

Comment - RRR000692 / 0012

The U.S. Department of the Interior has recognized the Tribe as an "affected Indian tribe" under the *Nuclear Waste Policy Act*. Neither the draft SElS nor the draft Rail EIS recognize the proximity of the tribe to the site and the likely impacts that will be felt throughout each phase of the Yucca Mountain Project. The final EISs should assess and analyze impacts to the Tribe's drinking water supply, impacts from truck transport of nuclear materials through tribal lands, socio-economic impacts, impacts to cultural resources, and environmental justice issues.

Response

The Repository SEIS and Rail Alignment EIS recognize the proximity and status of the Timbisha Shoshone Trust Lands. DOE conducted impact analyses for all land-use and ownership scenarios. It evaluated downgradient drinking-water supplies as part of hydrology impact studies for the SEIS and EIS. Both documents address truck transport scenarios, socioeconomic studies, cultural resource evaluations, and environmental justice issues.

1.7.18.1 (2855)

Comment - RRR000675 / 0009

The Draft Repository SEIS states that during tribal update meetings between October 2004 and January 2005 the Consolidated Group of Tribes and Organizations have recommended that additional studies be

conducted to address eight areas of concern related to potential adverse impacts to the American Indian landscape on page 3-59. Will this recommendation be acted on?

Response

The statement in the Draft Repository SEIS cited by the commenter was presented in the American Indian Writers Subgroup reference document to the Rail Alignment EIS, but is applicable to studies at Yucca Mountain. Cultural resources management and mitigation programs have been ongoing at Yucca Mountain since the late 1970s. American Indian involvement was integrated into the cultural resources program in the late 1980s. DOE has documented the "eight areas of concern" to American Indians referred to by the commenter through the ongoing Native American Interaction Program. In addition, the Department conducted a systematic ethnographic evaluation of the Yucca Mountain area in 1990, which remains applicable. A Programmatic Agreement with the Nevada State Historic Preservation Office that will address future cultural resources management efforts at Yucca Mountain that is under preparation requires American Indian involvement as outlined in the National Historic Preservation Act. That regulatory compliance effort will address issues of concern to American Indians.

1.7.18.1 (3101)

Comment - RRR000121 / 0008

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Violation of the WSNC Nuclear Free Zone Resolution 01-WSNC-95.

Response

DOE acknowledges that the Western Shoshone National Council passed a "Nuclear Free Zone Resolution."

1.7.18.1 (3102)

Comment - RRR000121 / 0009

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

The DOE effort to site a repository at Yucca Mountain takes land and cultural resources out of use by the Western Shoshone people.

Response

DOE interacted with American Indian 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, all), which the Department used as a resource in the preparation of the SEIS. This document discusses site characterization at Yucca Mountain and the Proposed Action in the context of American Indian culture, concerns, views, and beliefs about the surrounding region.

Based on the results of the report and these interactions, DOE acknowledges in the Repository SEIS that people from many American Indian 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. Further, the presence of a repository would represent an intrusion into what Native Americans consider an important cultural and spiritual area. DOE would continue to work to minimize impacts to American Indian peoples, their life ways, and culture.

1.7.18.1 (4046)

Comment - RRR000671 / 0065

Page 3-59 3.1.6.2.2—American Indian Views of Affected Environment—The text has attempted to minimize the views and opinions expressed to the DOE as they relate to the YMP [Yucca Mountain Project] EIS. The text should include all information relating to Affected Environment that was submitted by the American Indian Writers Subgroup.

Response

DOE has not attempted to minimize views of American Indians on the affected environment. The Repository SEIS is a supplement to the Yucca Mountain FEIS, which included American Indian perspectives presented by the American Indian Writers Subgroup. The American Indian Writers Subgroup document prepared for the FEIS is the basis for tribal perspectives, as cited in Section 3.1.6.2 of the SEIS.

1.7.18.1 (4127)

Comment - RRR000121 / 0004

Large uncertainties color the perception of the Western Shoshone people toward nuclear issues. Potential threats must be assessed from a tribally appropriate perspective that views property ownership of Yucca Mountain and the Rail Alignment Corridor within the Treaty of Ruby Valley boundaries as being vested in the Western Shoshone people. The use of a solely US perspective focusing on programs upon which progress of commercial nuclear technology depends is racial discrimination now commonly known as environmental racism.

The use of "cultural triage" in the selection and development of Yucca Mountain effects developmental genocide. The use of subcontractors by the DOE imply impunity from sanction. Subcontractors defuse and confuse responsibility for the acts violating tribal life-ways and shelter the DOE from immediate identification and long term risks. Subcontractors act as a mask and shield to cover for activities not otherwise conducted or [performed] by persons acting in official DOE capacity.

Response

Such viewpoints continue to be documented and evaluated as part of the Native American Interaction Program and project reports, including the Repository SEIS. DOE is carrying out the mandates of the NWPA, as directed by Congress. Further, DOE considers it important to address American Indian issues, in a manner consistent with the Act, and will continue to interact with the tribes and organizations to receive their input.

1.7.18.2 Perspectives on Intergovernmental Interactions

1.7.18.2 (332)

Comment - RRR000100 / 0005

The commenter asked if DOE had done any consultation with tribes in the area and was not aware that any consultation had occurred with tribes in the Owens Valley. The commenter hoped that consultation

had occurred with at least the Timbisha Shoshone Tribe in Death Valley because that is where water from Yucca Mountain might end up.

Response

The Native American Interaction Program, which includes 17 tribes and organizations from Utah, Arizona, California, and Nevada, has been ongoing since the late 1980s. The program includes representatives from Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone Tribes. All the tribes in the Owens Valley (Big Pine, Lone Pine, Fort Independence, Bishop, and Benton) are represented in the program, which fosters a government-to-government consultation process. The Timbisha Shoshone Tribe is also represented. In addition, consultation between DOE and the tribes has occurred at tribal locations. The Department has gained valuable input and perspectives through the interaction program, and has presented those perspectives in the Repository SEIS. Section 3.1.4.2 of the Repository SEIS discusses groundwater flow characteristics in the Yucca Mountain area. Section 5.4 of the SEIS addresses locations for impact assessments, including groundwater, in the postclosure (long-term) period of the repository.

1.7.18.2 (633)

Comment - RRR000283 / 0004

The commenter referred to Section S.3.3.2 of the Repository SEIS, in which DOE commits to continuing consultation with American Indians, and requested that DOE host regional meetings with local tribal nations and native peoples because they are key stakeholders.

Response

DOE hosts tribal update meetings with representatives from tribal governments on a regular basis to discuss the repository and transportation programs, and will continue to do so. In addition, the Department can accommodate consultation at tribal locations or in a regional setting as necessary.

1.7.18.2 (1520)

Comment - RRR000690 / 0001

The Timbisha Shoshone Tribe (“Tribe”) hereby submits the following comments concerning the Draft Supplemental Environmental Impact Statement (EIS). Please note that as the Tribe was only recently granted affected status this past July 2007, we provide these comments in the absence of being able to fully analyze and address the issues addressed by the EIS documents. With the arrival of appropriate financial support, we will provide supplemental comments to this and the rail alignment EIS as soon as practicable.

Response

Thank you for your comment.

1.7.18.2 (1580)

Comment - RRR000690 / 0037

Potential impacts to tribal fiscal resources for having to review and respond to DOE documents.

Response

DOE has requested $500,000.00 for the Timbisha Shoshone Tribe in fiscal year 2009 so the Tribe can participate in Yucca Mountain Project oversight activities.

1.7.18.2 (1584)

Comment - RRR000690 / 0033

Potential impacts to the Government-to-Government relationship between the Tribe and federal government.

Response

DOE government-to-government interactions with the Timbisha Shoshone Tribe have been ongoing as part of the Native American Interaction Program since the late 1980s. Direct consultations with tribal officers have occurred at the tribal location. Since the Tribe received affected status under the requirements of the *Nuclear Waste Policy Act*, more interactions have occurred. An ongoing consultation process between the Tribe and DOE will continue to be useful in the sharing of information.

1.7.18.2 (1589)

Comment - RRR000690 / 0028

The project impacts Indian peoples by diminishing the capacity for self-government from the deployment of limited human and technical resources from normal day-to-day affairs to unfounded monitoring and response to DOE characterization and licensing activity.

Response

The Timbisha Shoshone Tribe has been an integral part of the Native American Interaction Program since the late 1980s, and DOE has gained valuable input from the Tribe. There is no intention on the part of DOE to diminish the Tribe's capacity for self-governance. Since the granting of affected status to the Tribe under the requirements of the *Nuclear Waste Policy Act*, DOE has been pursuing funding for the Tribe. The Department has requested $500,000.00 for the Tribe in fiscal year 2009 for project oversight activities.

1.7.18.2 (1591)

Comment - RRR000690 / 0026

The Yucca Mountain Repository Project takes land and cultural resources out of the use of Western Shoshone people, of whom the Timbisha Shoshone are members.

Response

DOE acknowledges in the Repository SEIS that American Indian tribes have used the area proposed for the repository, as well as nearby lands; that the lands around the repository 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 site area. DOE recognizes that construction and operations of a repository at Yucca Mountain would have continuing adverse impacts for American Indians who view past, ongoing, and future repository-related activities as an intrusion on a culturally important and sacred landscape. DOE would continue to interact with Americans Indians to ensure that such impacts are limited to the fullest extent possible.

1.7.18.2 (1625)

Comment - RRR000690 / 0005

The Timbisha Shoshone believe that the United States governments acquisition and dispensation of information concerning the Yucca Mountain Project (YMP) has been woefully inadequate and does not

satisfy the governments legal and regulatory obligation to obtain indigenous peoples perspectives concerning the YMP depository project and its potential impacts. The Timbisha Shoshone insist that the best and most meaningful means of communicating would be on a government-to-government basis.

Response

DOE agrees with the statement about the value of meaningful communications with tribes and is always open to interacting directly with tribal governments. DOE has, over the years, met directly with officers of the Timbisha Shoshone Tribe to discuss the repository and transportation programs. In addition, since the Timbisha Shoshone Tribe was recently granted affected status under the requirements of the *Nuclear Waste Policy Act*, several meetings have taken place and will continue in the future.

DOE has maintained a Native American Interaction Program with 16 tribes and one organization since the late 1980s. During the preparation of the Yucca Mountain FEIS, DOE interacted with American Indian tribes on a range of topics of interest to better understand 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), which it used as a reference in preparing the FEIS and this Repository SEIS. In addition, DOE is engaged in ongoing consultation with the Nevada State Historic Preservation Office to ensure that the Project considers cultural resources appropriately. These consultation processes ensure DOE has adequately analyzed cultural impacts and considered them in the FEIS and SEIS.

1.7.18.2 (2725)

Comment - RRR000675 / 0001

The Tribe is a unique sovereign nation and requires consultation pursuant to Executive Order 13175. The Consolidated Group of Tribes and Organizations (CGTO) is an approach for information sharing, but should not be considered as consultation as required by Executive Order 13175. The Tribe requests that DOE decision making officials meet directly with the Tribal Council on the Big Pine Reservation to discuss the Yucca Mountain Repository for consultation requirements to be met.

Response

While neither the Consolidated Group of Tribes and Organizations nor DOE consider interactions with the Group as formal government-to-government consultation, both consider the process to contribute to formal consultation. In addition, DOE is always open to interacting directly with tribal governments. Over the years, the Department met directly with tribal officers of the Big Pine Paiute Tribe of the Owens Valley to discuss the repository and transportation programs.

1.7.18.2 (2854)

Comment - RRR000675 / 0008

The Draft Repository SEIS states on page S-28 that it is DOE'S intention to maintain its commitment to the Native American Interaction Program throughout the implementation of the proposed action. While the text is clear, there is a question by the tribes about the sincerity of the stated intention and commitment of the DOE. Accordingly, the statement should be modified if the DOE does not intend to honor their commitment to working collaboratively with the Consolidated Group of Tribes and Organizations and resume meeting annually as they have previously agreed and not on an activity driven basis as they have recently stated to the CGTO in November 2007.

Response

DOE commits to continue to support the efforts of the Native American Interaction Program and to resume tribal update meetings that will not be "activity driven" but scheduled on an annual basis. The Department also commits to a continuing consultation process.

1.7.18.2 (3096)

Comment - RRR000121 / 0006

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Disruption of foreign relations between Newe Sogobia results when treaty violations by US occur;

Impact to foreign relations with Goshute tribe over transportation and storage of waste at private fuel storage facility in transportation aging and disposal canisters.

Response

The Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them land rights to approximately one-third of the State of Nevada (including the Yucca Mountain region), along with portions of California, Utah, and Idaho. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury. DOE is aware that among the American Indian community there is significant disagreement with the Court rulings. In any case, the government-to-government relationship between the tribes and the Federal Government precludes tribal foreign relationships.

1.7.18.2 (3197)

Comment - RRR000121 / 0019

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

[There could be] impacts to the government-to-government relationship between the tribe and the federal government being further strained over conflict in ownership of the Yucca Mountain site.

Response

DOE recognizes that there is a difference of opinion between the Western Shoshones and the Federal Government that might strain relationships. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with payment of a final award into an interest-bearing trust account in the United States Treasury. Although there is disagreement from some Western Shoshone people over the Supreme Court decision, that decision is final. While DOE will continue to foster government-to-government interactions with tribes, it is bound by the Court's decision on ownership of the site.

1.7.18.2 (4038)

Comment - RRR000671 / 0057

Page S-17—S.2.4 Transportation—The text indicates that barges will be used to ship spent nuclear fuel to the nearest rail line. The CGTO is concerned that no efforts have been made nor is it indicated that those tribes and tribal communities near nuclear power plants that require barge shipments have been notified and the DOE is working collaboratively on a government-to-government basis as required.

Response

Appendix H of this Repository SEIS discusses requirements and planning information for routing and notification of shipments of spent nuclear fuel and high-level radioactive waste, including barge shipments.

1.7.18.2 (4040)

Comment - RRR000671 / 0059

Page S-28—American Indian Viewpoint—The text indicates that it is DOE's intention to maintain its commitment to the Native American Interaction Program throughout the implementation of the proposed action. While the text is clear, there is a question by the tribes about the sincerity of the stated intention and commitment of the DOE. Accordingly, the statement should be modified if the DOE does not intend to honor their commitment to working collaboratively with the Consolidated Group of Tribes and Organizations and resume meeting annually as they have previously agreed and not on an activity driven basis as they have recently stated to the CGTO in November 2007.

Response

DOE commits to continue to support the efforts of the Native American Interaction Program and to resume tribal update meetings that will not be "activity driven" but scheduled on an annual basis. The Department also commits to a continuing consultation process.

1.7.18.2 (4045)

Comment - RRR000671 / 0064

Page 3-59 3.1.6.2 American Indian Interests—3.1.6.2.1 Yucca Mountain Project, Native American Interaction Program—The text states that the YMP/NAIP [Yucca Mountain Project Native American Interaction Program] concentrates on the protection of cultural resources at Yucca Mountain and promotes a government-to-government relationship with tribes and organizations. The DOE has not upheld its previous commitments to meet regularly with the tribes and organizations, as previously agreed and has made [no] attempt to allow the culturally affiliated tribes and organizations the opportunity to monitor cultural resources as previously agreed. Therefore, the text should be revised to accurately reflect the inherent limitations and if it does in fact intend to allow the tribes and organizations the opportunity to visit and monitor cultural resources as the tribes have requested then the text should be modified to state that "while the DOE has not fulfilled it[s] previous commitments to the CGTO, i[t] now intends to resume tribal interactions as stated."

Response

DOE does promote a government-to-government interaction process and will continue to seek tribal input to cultural studies associated with the Yucca Mountain Project. DOE agrees with the Consolidated Group

of Tribes and Organizations and, to the extent practicable, will include American Indian monitors in all surveys to identify cultural sites in the affected areas.

1.7.18.2 (4053)

Comment - RRR000101 / 0017

The commenter stated that although DOE is using it, the land has been and always will be American Indian land that Indian people know about, use, and are concerned about; thus, the American Indian people want to make sure that they are always included in the process, no matter what happens, even if it is after closure of the repository, because these lands are important resources to them.

Response

The Repository SEIS considers extensive cultural resources analyses, tribal perspectives, impact identification, and appropriate mitigations. DOE will continue to interact with tribes and to seek American Indian perspectives throughout the life of the project.

1.7.18.2 (4078)

Comment - RRR000121 / 0001

The approach used herein will provide a land ownership perspective of the WSNC challenging the ownership assumptions to Yucca Mountain contained in the Repository SEIS and the associated Rail Alignment corridor. Proceeding with a tribally appropriate cultural perspective that includes land ownership provides a clearer understanding of the high sense of responsibility for the land possessed by Western Shoshone nationals and the responsibility of the WSNC to protect the property rights of [its] citizens. By identifying the extant land rights of the Western Shoshone people a clearer understanding of risks to Native Americans can be assessed.

BACKGROUND

The WSNC is the government de jure with complete sovereignty exercising full powers of self-government for the protection of the collective and individual rights and titles of Western Shoshone nationals. The government of Newe Sogobia has ruled in an unbroken line of succession from time immemorial. Continuity is the dominant concept of tribal property rights and other fundamental rights and liberties. The custom of Newe Sogobia derives its force and authority from the universal consent and immemorial practice of the people. The source of law is the inherent sovereign right of each tribal individual endowed by the Creator, then delegated to the Chief and Principle Men in council to exercise collectively on behalf of the people. There is no separation of religion from the government established by the people. For thousands of years the Western Shoshone have been a land-centered people living a culture of land ownership. Land ownership rights and responsibilities have always been a stabilizing factor of community in sense of place, memories and of bonds uniting the Western Shoshone people to the soil. Land use over millennia provided social and economic benefit developing a culture of land ownership.

Newe Sogobia's entry and commitment to International Law began by laying down arms and guaranteeing "peace and friendship" in 1863 by treaty relations with the US that emanates from International Law. The firm configuration of the boundaries of Newe Sogobia are identified in Article V of the 1863 Treaty of Ruby Valley (18 US Statute 689-693) and furnishes the WSNC with a formally recognized setting for the exercise of its power and at least relative recognition of the coexistence beyond these boundaries of the US exercising similar powers. Specific rights were granted to the US for rights-

of-way and access for specific purposes. The US agreed to pay for the rights sought and damage done to the property interests disturbed in Article VII. WSNC exercise of sovereign power over Newe Sogobia was acknowledged and guaranteed for the safety of foreigners under Article 11.

Since the signing of the treaty a long simmering warm dispute between the government of Newe Sogobia and the US has existed over competition for land. A subtle violence of economic interests and even well intentioned initiatives coming from the US undermine Western Shoshone tribal life-ways and self-government stability. Gradual encroachment and the application of federal land laws extraterritorially by the US condone racism rather than justice and marginalize Western Shoshone nationals.

An effort by the US to end the dispute in 1946 resulted in the creation [of] the Indian Claims Commission to identify tribal groups, determine lands taken and provide payment for lands "taken". In the Case of the Western Shoshone no taking had occurred. A report prepared by the WSNC in 2003 highlights the failure of the ICC [Indian Claims Commission] to achieve its statutory mandate (Attachment II). The report finds that:

The Final Report of the ICC tells us for a certainty that the Indian Claims Commission failed to fulfill the reporting requirement of Section 22(a) of the *Indian Claims Commission Act* in the Western Shoshone case. Section 22(a) of the ICC Act specified the two ingredients necessary for the Indian Claims Commission to reach "finality" in any given case. One ingredient was the Commission's report of its final determination and judgment to Congress. The second ingredient was payment to the Indians of the compensation owed to them. The United States Supreme Court in the 1985 ruling U.S. v. Dann failed to discover that the ICC had never been able to fulfill the first reporting ingredient of "finality" in the Western Shoshone case, thus resulting in an error of fact in the decision.

The United States government has relied on the ruling in U.S. v. Dann to contend that the Western Shoshone are barred from raising the question of Western Shoshone title because of the ruling in U.S. v. Dann that the Western Shoshone were paid when the U.S. government paid itself on their behalf. However, such "finality" could only be reached in the Western Shoshone case if the Indian Claims Commission actually did file its report with Congress in the Western Shoshone case, and if the Western Shoshone were paid. Because the Indian Claims Commission no longer exists, the reporting requirement of the ICC Act will forever remain unfulfilled by the Indian Claims Commission. Extant Western Shoshone property rights antedated and survive the US forced claim to Newe Sogobia following the legal tradition of continuity. For example, property rights are presumed to continue until there is something that takes them away. All rights and liberties are of that fundamental nature. Newe Sogobia can only be got and held by discrimination of race and the misuse of US policy for political exclusion.

Under 10 CFR 63 Land Ownership and Control the DOE is required to have ownership, jurisdiction and control of interest in land used as a repository (Section 63.121). No such authority exists to transfer land ownership and jurisdiction vested in the Newe Sogobia to the US and, the ICC process claimed in the Repository SEIS to have done so was not completed.

Response

The Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them land rights to approximately one-third of the State of Nevada (including the Yucca Mountain region), along with portions of California, Utah, and Idaho. However, a 1985 Supreme Court decision (DIRS 148197-United States v. Dann) held that the Western Shoshone claim to the land associated with the Ruby Valley Treaty has been extinguished, and that fair compensation has been made. The Supreme Court ruled that even though the monetary award has not been distributed, the United States has met its obligation with

payment of a final award into an interest-bearing trust account in the United States Treasury. While DOE recognizes that there is a difference of opinion between the Western Shoshones and the federal government over this issue, it is bound by the Supreme Court's decision on ownership of the site.

1.7.18.2 (4091)

Comment - RRR000671 / 0075

Page 6-37 6.4.1.9 American Indian Interests—The text ... identifies the Northern Paiute peoples as traditionally occupying lands north of Goldfield and Tonopah. This information is misleading in that Western Shoshone peoples also occupied lands north of Goldfield and Tonopah including two federally recognized tribes located in Yomba and Duckwater. Further, the text states that the Department would continue to consult with American Indian Tribes with regard to their interests and beliefs however, the DOE has not fulfilled its previous commitments to work [on a] collaborative and regular basis with the Consolidated Group of Tribes and Organizations. The text should be revised [to] clarify these recommendations and address the issues of non-compliance with previous commitments.

Response

DOE intended the text in question to identify in general traditional boundaries of certain American Indian groups in the area. A more accurate direction from Goldfield and Tonopah is "northwest," which DOE has added to the text. DOE will continue to promote a government-to-government interaction process and will continue to seek tribal input to cultural studies associated with the Yucca Mountain Project.

1.8 Short Term Impacts

1.8.1 Retrieval

1.8.1 (33)

Comment - 22 comments summarized

Retrieval

Commenters stated that because of technology developments in the future, waste emplaced in the Yucca Mountain Geologic Repository should be retrievable for a period of at least 100 to 300 years following emplacement. Commenters wanted to know the details of the retrievability system and how retrievability would work in the case of waste removal for reprocessing or in the case of an emergency event. Commenters mentioned the Global Nuclear Energy Partnership (GNEP) initiative and asked for a discussion of the relationship between GNEP and the repository. In addition, commenters wanted assurance that DOE would clearly mark the repository location for future generations.

Response

Retrieval of emplaced waste packages is not part of the Proposed Action as described in Chapter 2, Section 2.1 of the Repository SEIS. Retrieval is a contingency operation and would be the reverse or opposite of emplacement operations. Chapter 2, Section 2.1.2.2 of the Repository SEIS describes the facilities and operations associated with emplacement. The impact analysis and description of the retrieval contingency are included in Section 4.2 of the Repository SEIS.

The Yucca Mountain FEIS evaluated a range of preclosure periods, including up to 300 years. The Repository SEIS evaluates a 100-year preclosure period with an acknowledgement of the additional

impacts that would be likely for a 300-year period. The NRC licensing process will be the determining factor for how long the repository is licensed to remain in an open, monitored condition prior to permanent closure. The SEIS presented the potential impacts of the range of monitoring period durations.

The Department is preparing a draft programmatic EIS on the Global Nuclear Energy Partnership (GNEP DPEIS). GNEP is discussed at the Introduction of this CRD Part V. Global Nuclear Energy Partnership Inventory and is included in the cumulative impacts discussion in Chapter 8, Section 8.1.2.4.1, of the Repository SEIS.

DOE is required to perform monitoring; a detailed plan is required prior to closure (10 CFR Part 63.51).

1.8.2 Receipt Prior to the Start of Emplacement

1.9 Long-Term Repository Impacts

1.9 (75)

Comment - 12 comments summarized

Climate Change

Commenters noted that estimating long-term performance of the repository should consider the current arid climate of the region, surface transport of radioactive contamination during flooding, and the potential for changing climate conditions.

Response

The Total System Performance Assessment (TSPA) model addresses the semiarid climate of the region and the response of the repository system to climate change; Section F.2.2.1 of the Repository SEIS discusses these results. There are no credible scenarios in which transport of radioactive contamination due to surface water from the repository to the biosphere could occur. All climate scenarios would result in a net infiltration of the repository without resultant flooding up to the surface. Therefore, the model does not include any surface transport.

1.9 (76)

Comment - 2 comments summarized

Broad Concern About Long-Term Performance

Commenters expressed broad concerns about long-term performance of the repository. Commenters questioned the applicability of the draft EPA standard to protection of human health and whether the repository would be able to meet the draft standard.

Response

The development and use of tools to evaluate the long-term (postclosure) performance of the repository include an enormous body of research that spans more than 30 years. The Yucca Mountain site-specific work that has occurred over this time involves millions of work-hours by scientists in hundreds of disciplines. TSPA is the internationally accepted approach for assessing the performance of a repository The TSPA that DOE used to estimate postclosure impacts in this Repository SEIS has undergone extensive peer review and public scrutiny; it is built on a large body of research and testing. The draft EPA standard dose limit represents a very stringent requirement. When issued in final form, the EPA

standard will be consistent with the National Academy of Sciences recommendations to ensure the protection of the public health and welfare. The results of the TSPA, even with the inclusion of assumptions that tend to overstate the risk, demonstrate that potential doses from the repository would not come close to the proposed regulatory dose limit.

1.9 (77)

Comment - 2 comments summarized

Postclosure Monitoring

A commenter on the Repository SEIS asked: Why is no postclosure monitoring plan presented?

Response

DOE is required by regulation to implement monitoring after closure of the repository. The Department would submit the monitoring plan as part of the application for a license amendment to close the repository. It would develop postclosure monitoring plans as part of the ongoing planning and design of the repository and would submit them with the closure application.

1.9 (97)

Comment - 5 comments summarized

Atmospheric Volcanic Pathway

The Repository SEIS should include and analyze exposure consequences for different definitions of "reasonably maximally exposed individual" (RMEI) specifically defined for atmospheric as well as groundwater pathways. This should include, without limitation, atmospheric transport pathways associated with the Volcanic Eruption Modeling Case. The analysis should include a population dose related to exposure/inhalation from the Volcanic Eruption Modeling Case atmospheric pathway, similar to that provided for gaseous release of carbon 14 on page 5-31 of the Draft SEIS. The analysis should also consider the consequences of inhalation of radioisotopes prior to deposition on the land surface. DOE should base the assessment on prevailing wind direction and speed data at an elevation commensurate with the height of the expected plume, which most certainly is greater than 10 to 60 meters.

Response

The EPA and NRC regulations that relate to the licensing of the proposed repository require that DOE's performance assessment must consider all potential pathways of radionuclide transport and exposure for the RMEI. DOE has modified Section S.3.2.1.3 of the SEIS Summary and the introductory section to Chapter 5 to make this clear. The TSPA results in the SEIS consider all potential pathways, including airborne releases. DOE used the same characteristics of the RMEI, including location and lifestyle, for all TSPA calculations. The impacts of the Volcanic Eruption Modeling Case stem from contamination of the soil and feed into the same biosphere model as the Groundwater Case. The biosphere model converts soil contamination to dose. The Volcanic Eruption Modeling Case does not explicitly include the inhalation dose in the results because they would be very small in comparison with the groundwater pathway doses related to the eruption processes. For example, if the eruption occurred 1,000 years after closure, the annual inhalation dose to the RMEI at the specified location would be about 1 percent of the groundwater pathway dose. At 10,000 years, the annual inhalation dose to the RMEI at the specific location would be about 0.1 percent of the groundwater pathway dose (DIRS 178871-SNL 2008, Figure 6.5-14). The commenter is correct that wind data at altitudes much higher than 10 to 60 meters would be necessary for

the Eruption Case. The Eruption Case used wind data at altitudes between 1.5 and 8.2 kilometers, which correspond to column heights of the eruption plume.

1.9 (263)

Comment - RRR000328 / 0002

The commenter stated that DOE should stop using Standard or Reference Man in analyzing radiation dose health impacts; rather, the Department should use standard or reference pregnant women. DOE should analyze the health impacts of Yucca Mountain radioactive leakage into the drinking water supply on the most vulnerable individuals and populations downstream, including pregnant women, fetuses, infants, children, the elderly, all those with compromised immune systems, Western Shoshone Indians living traditional lifestyles, subsistence farmers living in the future, and persons consuming foodstuffs such as dairy products from nearby Yucca Mountain but exported elsewhere.

Response

EPA adopted the RMEI concept to ensure that the regulation would cover those few persons most at risk from releases from a repository. The development of the RMEI used data from a survey that considered the individuals residing in the area of the proposed repository and their lifestyles. The purpose of the RMEI is to provide a maximum individual in terms of dose. The conversion to health effects using standards set by the International Council on Radiation Protection accounts for details on specific sensitivities of various members of the population. This conversion is conservative. However, the estimated impacts of postclosure performance, even for the 95th percentile (only 5 percent of the doses would be higher), indicate a probability of less than 1 in 100,000 for an individual health effect, so any small differences among the characteristics of individuals would lead to small changes in an already very small value.

1.9 (409)

Comment - RRR000329 / 0002

Since its inception, Yucca Mountain has failed to meet even minimum public health and safety standards. In 2004, the US Court of Appeals for the DC Circuit ruled that the Environmental Protection Agency's original 10,000 year safety standard on radiation containment at Yucca [was] inconsistent with Congressionally mandated National Academy of Sciences recommendations. Despite this ruling, the revised two-tiered standards proposed by EPA remain inadequate to protect public health after Yucca is filled and sealed.

Under the revised standards, once Yucca is filled and sealed, EPA would legally allow the public to be exposed to a fifteen millirem/year dose of radiation for the first 10,000 years of the repository's life span. This is despite the fact that for decades, EPA's argued that any radiation dose between fifteen to twenty-five millirem and above per year is non-protective of public health.

For the period beyond 10,000 years, the EPA sets a radiation exposure limit of 350 millirem/year. According to a National Academy of Sciences report on radiation risks, this 2300 percent exposure increase over what is permitted for the first 10,000 years will cause cancer in approximately one out of every thirty-six people exposed. Furthermore, given that compliance for this post-10,000 year standard would be based on a median dose distribution rather than a mean dose distribution, half of the radiation exposures could result in doses exceeding 350 millirem/year.

Response

Although EPA is the federal agency with responsibility and authority for setting a dose standard for Yucca Mountain, there are several aspects of this comment that DOE can address. DOE knows of no basis for the conclusion that doses of 15 millirem are not protective of public health, because larger values occur in other EPA and NRC regulations, as well as in international consensus documents on acceptable levels of radiation risk. The Repository SEIS reports an estimated mean value of less than 0.3 millirem per year for the first 10,000 years. This range is well below the 15-millirem value mentioned by the commenter, which corresponds to a probability of a latent cancer fatality of less than 2×10^{-7}, which is well below the risks cited by the National Academy of Sciences as starting points for developing the regulation. In the post-10,000-year period, the estimated median dose would be about 1 millirem per year, which would translate to a latent cancer fatality probability of about 6×10^{-7} which is below the risks cited by the Academy as starting points for developing the regulation.

Notwithstanding any objection the commenter might have to EPA standards, the estimated impacts are far below what should be a level of concern. DOE is unable to find material in the National Academy of Sciences report that supports the conclusion that 350 millirem per year would lead to cancer in 1 of every 36 people. In normal populations, 20 percent of the people are likely to die of cancer. Over a 70-year lifetime, the 15-millirem level of exposure would be likely to increase this number to slightly less than 21 percent only if all members of the population were exposed at the level of the maximally exposed individual, which is not a credible assumption. Over that same lifetime, the 350-millirem level of exposure would be likely to increase this number to slightly more than 22 percent, again only if all members of the population were exposed at the level of the maximally exposed individual. The impacts to the population as a whole would be less because the vast majority would receive less exposure than the RMEI. The purpose of both the mean and median is to be a measure of central tendency. If there is a difference between the mean and the median, especially if it is significant, the data are skewed, and care must be used in interpreting the data. The results in the SEIS are not highly skewed; there is a significant portion of the results above both the mean and the median values in the curves in Figure S-13 (the value of the mean is approximately a factor of 2 higher than the median—2 millirem per year versus 1 millirem per year).

1.9 (426)

Comment - RRR000290 / 0005

Third, there are significant discrepancies between estimated mean annual radiation dose exposures between the FEIS and the Draft SEIS. DOE admits that this is a result of modeling differences and not necessarily a result of improved designs. Thus, the department effectively admits that it's simply—that it can simply change its assumptions and make the repository look environmentally sound.

Response

DOE is aware that there is a difference in the long-term projections of potential exposure between the Yucca Mountain FEIS and this Repository SEIS. This is not due to significant changes in the models of physical processes incorporated in the TSPA, but rather to the requirements in the proposed EPA and NRC regulations. These regulations provide requirements for the first time about how to perform a total system performance assessment extending through the period of geologic stability, which EPA defined as 1,000,000 years. Section 5.1 of the Repository SEIS discusses changes in the model and their impacts. Following these requirements, the results in the SEIS address long-term scenarios in a rigorous, structured

manner, and are different from those of the FEIS. These differences, which are described in the text box in Section 5.5.1 of the SEIS, provide a basis for comparison of the SEIS to earlier results.

In relation to the change in radiological health impacts to the public during the 10,000-year period, Section 7.1.1 of the Repository SEIS explains that DOE used the International Commission on Radiological Protection inhalation and ingestion dose coefficients from the "Database of Dose Coefficients: Workers and Members of the Public" and the groundshine and immersion dose coefficients from Federal Guidance Report 13 to estimate radiation doses. Some of the dose coefficients increased and some decreased. For the radionuclides that contributed the most to long-term dose in the No-Action Alternative, the coefficients decreased, resulting in an overall decrease in estimated long-term radiological consequences.

1.9 (909)

Comment - RRR000667 / 0002

Section 3.1.3.3, Modern Seismic Activity (pages 3-22 and 3-23), discusses the nature of seismic activity in the region around Yucca Mountain. DOE notes that questions have been raised in recent journal articles regarding the differences in observed strain rates in the area versus forecasted rates (which form the bases for the design of the Yucca Mountain repository and forecasting its long-term performance), and whether these rates have been underestimated. If this is correct, the analysis of the potential for seismic (and volcanic) hazards could be underestimated. EPA recommends that the final SEIS explain how DOE will determine the appropriate strain rates to be incorporated in the conceptual seismic model.

Response

DOE has expanded the discussion of strain in Section 3.1.3.3 of the Repository SEIS to characterize the nature of the apparent inconsistency. Section 3.1.3.3 now notes that differences between strain measured from geodetic stations and expectations from geologic data have been observed at locations world-wide, including other locations in the Basin and Range Region. Further, explaining these differences is a major field of scientific inquiry and the scientific community is considering other reasons for these differences, including the possibility that some strain could be released aseismically (that is, without seismic activity) or that short-term irregularities in strain rates are simply not observable in the geologic record. The most recent probabilistic volcanic hazard analysis (PVHA) for Yucca Mountain considered the latest strain data, but these strain data probably had little effect because the primary focus of that effort was evidence of past volcanic activity. In the light of these recent PVHA studies, the DOE evaluation of seismic hazard at Yucca Mountain and the seismic design criteria are conservative and supported by site-specific data.

1.9 (1561)

Comment - RRR000325 / 0009

The commenter stated that DOE must stop using statistical manipulations to hide the actual levels of radiation dose exposure and consequent health impacts that vulnerable individuals would suffer over the next million years. He stated that the National Academy of Science has reported in recent years that any dose of radiation, no matter how small, carries a health risk and that those health risks, at low levels, are disproportionately higher than previously reported.

Response

DOE does not use statistical manipulations in the sense implied in this comment. TSPA is the internationally accepted approach for assessing the performance of a repository. Deterministic

projections (those that do not include the probability of occurrence) are not appropriate for examining the future behavior of a complex natural and engineered system for very long times. For example, DOE must, by regulation, consider events with probabilities at the level of something happening one time in 100,000,000 years. The TSPA method is the only reasonable way to assess such a scenario. It is the method mandated by EPA and NRC proposed standards for licensing the repository. TSPA addresses uncertainties in the models and data, and follows a rigorous regulatory approach to address uncertainty. The Repository SEIS shows uncertainties in the results graphically. The SEIS does not hide dose levels, but rather displays them with a great deal of detail on the possible range and uncertainty of the estimates. DOE used accepted methods pursuant to the International Council on Radiation Protection to convert dose levels into health effects.

1.9 (1763)

Comment - RRR000657 / 0028

Comment: Section 5.1.1.4, page 5-9; Section 5.4 and Appendix F: This section discusses impacts at different locations. It states that the large water use at the RMEI location would "consume the entire plume" by withdrawing 3,000 acre feet of water," and since the plume is very narrow, the dose would be the same at all locations. This conclusion is illogical and may be a remnant of a conservative assumption that 100 percent of nuclides in the groundwater system would be dissolved in the representative volume specified by regulation. It does not make sense that as the distance from the repository increases that the combination of flow from different groundwater basins would not add more water to the flow system, potentially diluting the concentration of radionuclides in the groundwater. It is also not clear why Section 5.4, Locations for Impact Estimates, is included in the Draft Repository SEIS if no estimates are included for different locations per section 5.1.1.4. In addition, Appendix F, section F.2.8.2, page 2 states, "Matrix flow in the alluvium would provide a significant reduction in the movement of radionuclides to the environment."

Resolution: Since the dose to the RMEI is small, it is probably not necessary to model doses to hypothetical individuals farther downstream for regulatory purposes, but to say the dose farther downstream would be the same is incorrect. If calculations were completed farther downstream, the same conservative restraints required for calculating the RMEI dose per NRC regulations should not be applied. If not calculated (per the current Repository SEIS), it should be recognized that potential doses farther downstream would be lower if reasonable assumptions were applied. DOE needs to address the contradiction in the statements in section 5.1.1.4 and F.2.8.2.

Response

Although the Yucca Mountain FEIS provided estimates of population dose and health effects, DOE decided not to do so in the Repository SEIS, as explained in Section 5.1.1.4. The primary reason for this decision is that the dose estimates and health effects are based on RMEI lifestyle parameters, which should not be attributed to the general population at other locations. The RMEI is a hypothetical individual exposed by numerous pathways to radionuclides. By regulation, the RMEI lifestyle characteristics ensure the greatest exposure and thus tend to overstate the risk. The RMEI location is mandated by regulation to be that location closest to Yucca Mountain where human life can be maintained. The regulations intend, consistent with the National Academy of Sciences recommendations, that the standard be constructed to protect the few persons most at risk from the releases at the repository. As the Academy noted, and as the commenter admits, considering the future characteristics of a larger population would become so arbitrary that no adequate decision basis would exist.

The proposed EPA and NRC regulations define water use parameters. The RMEI would use water that by definition has the entire amount of radionuclides diluted in 3,000 acre-feet of water. The modeling results in the license application show that the plume of radionuclides would not spread widely. Further, the regulations require dilution in 3,000 acre-feet. In other words, there is no basis for projecting different concentrations at different distances. (See Chapter 5, Section 5.1.1.4 of the SEIS).

1.9 (1824)

Comment - RRR000622 / 0003

The commenter listed Yucca Mountain characteristics that would limit the potential long-term impacts presented in the Summary of the Repository SEIS. Following each characteristic, the commenter noted drawbacks to each positive attribute. The comment included issues of site isolation in the context of proximity to Amargosa Valley; land ownership and ability to withdraw and control the land because of the treaty lands of the Western Shoshone Nation; climate changes; the issue that Yucca Mountain groundwater is not a closed hydrogeologic basin; earthquakes; volcanoes; and possible aircraft crashes.

Response

DOE calculated potential long-term impacts for a RMEI who, by regulation, would live in the accessible environment above the highest concentration of radionuclides in the plume of contamination. The accessible environment is any point outside the controlled area, which is defined as the surface area identified by passive institutional controls, that would encompass no more than 300 square kilometers (120 square miles) (40 CFR 197.2). It must not extend farther south than 36 degrees, 40 minutes, 13.661 seconds north latitude, in the predominant direction of groundwater flow, and no more than 5 kilometers (3 miles) from the repository footprint in any other direction. The southernmost point of the controlled area, which is approximately 18 kilometers (11 miles) south of the repository, is the location of the RMEI in the TSPA-LA model. By regulation, this individual would have a diet and living style representative of the people who now reside in the town of Amargosa Valley. DOE must use projections based on surveys of the people who live in the town of Amargosa Valley to determine their diets and living styles, and use the mean values of these factors in the assessments for 40 CFR 197.20 and 40 CFR 197.25 but applied to a hypothetical individual in ways ensuring maximum exposures that tend to overstate the risk. Any dose to individuals living beyond the RMEI location would be no greater than that of the RMEI, for whom the dose is estimated in the Repository SEIS.

The land is controlled by the Federal Government and will continue to be as part of the licensing requirements. The Western Shoshone Tribe maintains that the Ruby Valley Treaty of 1863 gives them rights to 97,000 square kilometers (37,000 square miles) in Nevada, which includes the Yucca Mountain region. A legal dispute with the Federal Government led to a monetary award as payment for the land. However, the Western Shoshone have not accepted this award and maintain that there is no settlement. The U.S. Treasury is holding the monies in an interest-bearing account. In 1985, the U.S. Supreme Court ruled that the United States has met it obligations with the Indian Land Claims Commission's final award and the payment of the award into an interest-bearing trust account in the U.S. Treasury. DOE, as a federal agency, must abide by the Court's decision.

In July 2004, President George W. Bush and Congress approved payment to the Western Shoshone Tribe of more than $145 million in compensation and accrued interest based on the 1872 value of the land. Under provisions of the law, payment by the Federal Government officially subsumed Western Shoshone claims to 97,000 square kilometers of land in Nevada, Utah, California, and Idaho, based on the Ruby Valley Treaty of 1863. The law will distribute approximately $145 million in funds that the Indian Land

Claims Commission awarded the Tribe. There are approximately 6,000 eligible tribal members, and the law sets aside a separate revenue stream for educational purposes.

In March 2005, the Western Shoshone National Council filed a lawsuit against the United States, DOE, and the U.S. Department of the Interior in federal district court in Las Vegas, Nevada. The complaint sought an injunction to stop federal plans for the use of Yucca Mountain as a repository based on the five established uses of the land within the boundaries of the 1863 Ruby Valley Treaty. In May 2005, the U.S. District Court rejected a request from the Western Shoshone National Council for a preliminary injunction to stop DOE from applying for a license from the NRC for the Yucca Mountain Project.

DOE recognizes that American Indian people living in areas near Yucca Mountain have concerns about protection of traditional uses and the spiritual integrity of the land that extends into the Yucca Mountain site. DOE understands the presence of a repository would result in restrictions on access and intrude into what American Indians consider important cultural and spiritual areas. DOE will continue to consider American Indian input on the cultural resources and religious values and beliefs of the Yucca Mountain area.

DOE also recognizes that American Indian 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. Consistent with United States policy, DOE recognizes and commits to a government-to-government relationship with American Indian 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 consideration of tribal rights and concerns before taking actions, making decisions, or implementing programs that affect tribes.

TSPA is the internationally accepted approach for assessing the performance of a repository. The TSPA model has undergone public scrutiny and extensive peer review, including by international experts, and is built on a large body of experimental research and testing. The long-term projections of performance address the potential for uncertainty in the parameters used to calculate the expected releases, and hence, the results themselves. The TSPA model follows a rigorous regulatory approach to address uncertainty. The approach involves calculating the results over large ranges of parameter values to understand the statistical significance of the variability in the data. The Repository SEIS shows uncertainties in the results graphically. This approach is adequate to assess future repository performance.

Climate change is incorporated in the postclosure, long-term performance impacts analysis. The proposed EPA and NRC rules provide explicit direction about how to model very long term climate changes. The TSPA model incorporates future climate change as described in Appendix F, Section F.2.2.1.

The closed hydrologic basin is a larger region than the Amargosa Valley and it completely encompasses the drainage of the Amargosa River; surface water never reaches any outside river or ocean. DOE is aware that some groundwater might discharge into Death Valley, and supports the Inyo County research to study this issue. The Death Valley Regional Ground-Water Flow System study (DIRS 158876-D'Agnese et al. 2002, all) does not indicate any such discharge. If it were to occur, transport of radionuclides would have to occur through significantly larger volumes of water, and radionuclide concentrations would be reduced proportionately Deposition and resuspension is part of the water use-disposal-reuse cycle that DOE included in the dose modeling for the RMEI. Contamination from evaporated water does not produce additional dose, but rather is evaluated in the lifestyle of the RMEI (see Section 5.1.1.4). The proposed EPA and NRC regulations define water use parameters. The RMEI uses water that by definition has the entire amount of radionuclides diluted in 3,000 acre-feet of water.

Modeling results in the license application show that the plume of radionuclides would not spread widely. Further, the regulations require dilution in 3.000 acre-feet. In other words, there is no basis for projecting different concentrations at different distances. (See Chapter 5, Section 5.1.1.4 of the SEIS.)

In the long-term postclosure analysis, the TSPA model accounts for earthquakes and volcanoes. The estimated doses to the RMEI include the effects of the occurrence of such events. DOE did not analyze the potential impact from airplane crashes during the postclosure analysis because it eliminated this event from further consideration in the features, events and processes screening process it used to form the TSPA conceptual model (see Section F.2.1 of the SEIS). Section E.7 discusses airplane crashes during the preclosure period. DOE eliminated accidental crashes in the preclosure period, due to very low probability.

1.9 (2714)

Comment - RRR000664 / 0050

Overall the DOE seemed to be more comfortable analyzing impacts projected to occur in the far distant future—up to a million years from now—and ignored the obvious foreseeable events such as the explosion of population in southern Nevada that will push population and impacts closer to Yucca Mountain and will increase transportation activity and impacts of all kinds throughout the State of Nevada.

Response

DOE based the analyses in the Repository SEIS on population projections to 2067. This stylized population dose analysis assumed that people would continue to live where people live now. This assumption is consistent with recommendation by the National Academy of Sciences (DIRS 100018-National Research Council 1995, all) because it is impossible to make accurate predictions of lifestyles and residence locations far into the future.

1.9 (3125)

Comment - RRR000524 / 0028

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

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

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

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

Response

Sections F.4.2.2.1 and F.2.11.2 of this Repository SEIS discuss in detail the contribution of the TAD canister in long-term postclosure performance. The TAD canister would provide additional structural strength to the waste package, helping to prolong the time before package failure. The analysis calculated that codisposal packages that did not contain TAD canisters would be the first packages to fail. After failure of a package, the analysis assumed the TAD canister would provide no resistance to leakage but would continue to provide some sorption of radionuclides on corrosion products.

There is a significant decrease in the results for the Igneous Eruption (Extrusive) Case and an increase in the results for the Igneous Intrusion Case between the Yucca Mountain FEIS and the SEIS. DOE changed the method for simulating the two volcanic scenario classes to an analysis technique in the SEIS that not only explicitly considered the epistemic uncertainties, but also treated the aleatory uncertainties using Monte Carlo sampling and averaging of the resultant calculations. The SEIS presents updated references.

DOE determined the median curve in Figure F-17 (and all such plots) by adding, epistemic realization by epistemic realization, the annual dose histories contributed by each modeling case to obtain 300 total annual dose histories. The analysis calculated the median annual dose as a function of time from the 300 epistemic total annual dose histories by calculating at every point in time the 50th-percentile value. Because there are 300 values, it was necessary to average the two middle values to calculate the median.

The analysis assumed that the corrosion rate of a given metal would control its rate of release. It also assumed that the metal solubility would be so large as to not affect the mobility of the metal and that all the metal would remain in solution.

1.9 (3127)

Comment - RRR000524 / 0030

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

Response

Chapter 5, Section 5.1.1.4 of the Repository SEIS discusses plume width, dilution in groundwater, and decay during transport and concludes that there would be no discernable differences between the RMEI location and other downgradient locations for the postclosure impacts. It is not realistic to apply the lifestyle of the RMEI to the entire population of the region surrounding the proposed repository. The RMEI represents a hypothetical individual who would be most at risk because of the characteristics of the RMEI's lifestyle that are established by regulation (40 CFR 197.21). In addition, a large percentage of the population is urban with lifestyles dissimilar to the RMEI. There is no regulatory basis for assessing dose at other locations, and the characteristics of the RMEI are not appropriate for members of the general public.

1.9 (3132)

Comment - RRR000737 / 0014

In the past the essential containment strategy has been primary isolation due to natural barriers which was modified later to isolation through natural and engineered barriers. The DOE realized early on that toxins would reach beyond the mountain system, but the containment system has always been Yucca Mountain. DOE has stated in the SEIS (pg 1-12) that the closed basin downgradient from the repository provides a natural barrier to general spread of radionuclides. It appears that DOE has changed its containment strategy to include the entire hydrogeologic basin as part of the containment system. The DOE should not rely on a "containment system" that is outside of the Yucca Mountain Project.

Response

Section 121(b)(1)(B) of the NWPA and the proposed regulations developed by the EPA and the NRC deal with a system of multiple barriers, both natural and engineered, to limit doses from a repository to future populations. While geologic disposal was selected in part based on the capability of natural barriers to retard movement of radionuclides, no U.S. regulation or law has ever suggested that it is not appropriate to use all possible repository features to protect human health. Rather, the goal has been to characterize the long-term release of material to the accessible environment and then judge the level of impact that represents. In response to the National Academy of Sciences recommendations for a standard that looked at risk to individuals, EPA promulgated a proposed standard that defined the RMEI location and characteristics and an allowable exposure level. DOE must demonstrate that releases from the Yucca Mountain Repository would meet the proposed EPA standards. The Department has not changed a containment strategy; it has calculated exposures at the point directed by the EPA.

1.9 (3214)

Comment - RRR000841 / 0003

When discussing LCF the EIS only provides the LCF probability per person per year. Given we are trying to protect several thousand people for up to a million years, the public should be told the estimate of the total people who will be expected to die prematurely from a repository at Yucca Mountain. This should be a key parameter addressed in the EIS; it is not.

Response

Although the Yucca Mountain FEIS provided estimates of population dose and health effects, DOE decided not to do so in the Repository SEIS, as explained in Section 5.1.1.4. The primary reason for this decision is that the dose estimates and health effects are based on RMEI lifestyle parameters, which should not be attributed to the general population at other locations. The RMEI is a hypothetical individual exposed by numerous pathways to radionuclides. By regulation, the RMEI lifestyle characteristics ensure the greatest exposure and thus tend to overstate the risk. The RMEI location is mandated by regulation to be that location closest to Yucca Mountain where human life can be maintained. The regulations intend, consistent with the National Academy of Sciences recommendations, that the standard be constructed to protect the few persons most at risk from the releases at the repository. As the Academy noted, considering the future characteristics of a larger population would become so arbitrary that no adequate decision basis would exist.

1.9 (3451)

Comment - RRR000820 / 0003

The commenter stated that EIS did not adequately analyze the effects of groundwater contamination at the Yucca Mountain Repository due to leaking waste to special populations such as pregnant women, fetuses, infants, children, and the elderly.

Response

The RMEI is a regulatory construct that, while developed using lifestyle characteristics of the local population, is designed to ensure that those few individuals that are most at risk would be the basis for assessing safety. The conversion to health effects using standards set by the International Council on Radiation Protection accounts for details about specific sensitivities of various members of the population. This conversion is a conservative one. However, the estimated impacts of postclosure performance even for the 95th percentile (only 5 percent of the doses would be higher) indicate the probability of an individual health effect of less than 1 in 100,000. Any small differences for specific sensitive individuals would amount to small changes in an already very small number.

1.9 (3479)

Comment - RRR000232 / 0004

p. S-40 I do not think it is “conservative” to assume that a drilling intrusion could not occur before waste package failure, estimated to be 200,000 years after closure. Waste package performance is based on enormous extrapolation of material performance and is very uncertain. It can be seen from Fig. 5-8 that the estimated dose associated with human intrusion increases very rapidly with decreasing time of intrusion relative to closure.

Response

The human intrusion requirement addresses the earliest time after closure that a driller could drill into a waste package and not recognize the drilling has breached the package. Water well drilling tools would not allow a drill to penetrate metals that comprised the waste package until they degraded and lost their integrity. The 200,000-year estimate is an extremely conservative estimate of this time, meaning that it is early in time based on DOE’s estimate of how long a waste package would maintain its integrity. DOE based the estimate on the fact that the waste package would be susceptible to drilling once the drip shield failed, which is defined as loss of structural integrity by plate thinning (degradation by corrosion processes) or rupture or puncture (seismic-induced damage). Therefore, if there was a drip shield failure, DOE conservatively assumed that there would be a simultaneous waste package failure and loss of structural integrity such that the driller would not recognize the intrusion. Chapter 5, Section 5.8.1, of the Repository SEIS describes the conservative conditions used for drip shield failure. The increase in dose the commenter refers to would be a result of the regulatory guidance on how to do the calculation; it cannot be extrapolated back in time.

1.9 (3481)

Comment - RRR000232 / 0006

p. S-51 The last sentence of the second paragraph of Conclusions states “There would be no adverse health effect to individuals from these projected doses”. This is incorrect-unless you want to invoke a controversial threshold effect for radiological consequences. A threshold hypothesis is contrary to the

generally accepted linear hypothesis and if invoked needs to be justified. The discussion of radiological impacts on p. S-30 implies a linear relation between dose and latent cancer fatalities.

Response

The commenters are correct. Based on the linear hypothesis, even the very small projected doses could not be considered to present no adverse effect. DOE revised Section S.9.1 of the Repository SEIS to indicate that these very small doses would be unlikely to present significant adverse health effects to individuals.

1.9 (3482)

Comment - RRR000232 / 0007

General comment on treatment of radiological effect in the postclosure period. The treatment of this period stops at estimation of dose to RMEI at various times. The radiological impact depends on the number of people exposed to varying amounts of radiation, i.e., the product of dose and the affected population. An exercise to determine this impact was presented in Chapter 5 of the Final Environmental Impact Statement, Vol. I, where population estimates of the number of people exposed to varying levels of radiation were used to calculate the total impact. Although this particular exercise was flawed by an erroneous assumption about the hydrology and hence the effect on the population the Pahrump basin, it is the type of calculation required to assess the impact of the repository. It is of course very difficult to project human populations so far in the future.

Response

Although the Yucca Mountain FEIS provided estimates of population dose and health effects, DOE decided not to do so in the Repository SEIS, as explained in Section 5.1.1.4. The primary reason for this decision was that DOE based the dose estimates and health effects on RMEI lifestyle parameters, which should not be attributed to the general population at other locations. The RMEI is a hypothetical individual exposed by numerous pathways to radionuclides. By regulation, the RMEI lifestyle characteristics ensure the greatest exposure and thus tend to overstate the risk. The RMEI location is mandated by regulation to be that location closest to Yucca Mountain where human life can be maintained. The regulations intend, consistent with the National Academy of Sciences recommendations, that the standard be constructed to protect the few persons most at risk from the releases at the repository. As the Academy noted, and as the commenter admits, considering the future characteristics of a larger population would become so arbitrary that no adequate decision basis would exist.

1.9 (3826)

Comment - RRR000841 / 0002

The approach to evaluating the seismic and volcanic events leaves a lot to be desired. The NRC in presentations on risk informed decisions often talks about the risk triplet; (1) what can happen, (2) how likely is it to happen, and (3) what are the consequences when it does happen. This is a very good basis to inform all concerned, including those at risk. In presenting the results of the lower probability events forecast to happen at Yucca Mountain, the EIS only gives the expected dose and not the two individual components of probability and consequence. For the volcanic intrusion event the expected dose is below the NRC imposed limit. However, should the event occur, the annual dose to the local population would be several thousands of Rem (not mRem). The result, if the event occurred, would be mass extermination of the entire local population.

Furthermore, the effects of such an igneous intrusive event would be felt all along the groundwater flow path into California (Death Valley Junction, Shoshone, Tecopa, and finally into Death Valley where the radionuclides would be precipitated out on to the surface where they would be available for continental scale dispersal by the winds—a consequence not addressed by the EIS). The groundwater along the entire flow path would be polluted to such an extent that the whole region would be uninhabitable for hundreds of thousands of years or possibly longer. Yes, maybe the event has a low probability but the attendant consequences are absolutely huge. Why did not the EIS point this out for all to see?

In a similar manner, if a volcano erupted through the waste, the doses to the local population would be tens to hundreds of Rem. This dose although high is inconsequential to the dose that the local population would receive a few thousand year later from the intrusion release into the ground water. However, the EIS makes no mention of the volcanic dose potentially delivered to the residents of Las Vegas. This dose would be expected to be well below the tens of Rem to the local population but because of the number of people exposed (one to two million) the number of LCF [latent cancer fatalities] would be very significant over a long time. The EIS should have brought this risk to light.

Response

DOE based its consequence assessment on EPA requirements and proposed standards for evaluating postclosure performance of a repository. The risk triplet cited by the commenter is incorporated in the proposed EPA and NRC rules as the basis for determining which features, events, and processes the analyses would include. The NRC presentations define risk as the product of probability and consequence, and that is how the term is used in the regulations and, therefore, that is how DOE reports risk in the SEIS. Reporting event consequences without probability weighting is generally unrealistic and, therefore, not credible because it ignores the low probabilities involved. It is also a characteristic of very-low-probability events such as a volcanic eruption that the consequences of the event itself would probably be catastrophic even if the repository was not there. Compared with the physical effects of the event itself, the additional effect due to the repository is likely to be small. In this context, individual event consequences of igneous intrusion or volcanic eruption causing radionuclide release would be inconsequential.

1.9 (4107)

Comment - RRR000737 / 0023

The DOE has much more extensively discussed uncertainties in the DSEIS and this is good. However, there needs to be more clarification of how the "horsetail" probabilistic plots demonstrate the uncertainty. The DOE needs to explain these plots in greater detail, and delineate what kinds of uncertainties can be addressed or understood from such plots. DOE should be upfront that there exist other uncertainties more fundamental that are not addressed in these plots. For example, the aleatory and epistemic uncertainties discussed on pg. 5-17. The discussion does not mention fundamental model uncertainties due to incomplete and incorrect models and system assumptions. Where are the results of model uncertainty studies? The public is left with an incomplete understanding of the results of the alternative conceptual model studies and what specific uncertainties result. The DOE provides a good discussion concerning uncertainties due to unavailable data but should provide a table listing data that is lacking and the consequence of this unavailable data on the analysis and a discussion of how DOE is trying to compensate for the unavailable data. The DOE identifies sensitivity of the results to repository design but states that models and parameters for design alternatives do not have assigned uncertainties. Does this mean DOE is effectively ignoring this source of uncertainty?

Response

DOE added text boxes to Sections 5.5.1 and F.4 of the Repository SEIS to explain the "horsetail" plots in these sections. Aleatory uncertainty and epistemic uncertainty are two main categories that include all the uncertainties addressed by TSPA. Aleatory uncertainty deals with random events, such as an earthquake or a volcanic eruption, and epistemic uncertainty deals with variability of the data used in the models. The horsetail plots reflect these types of uncertainty. Chapter 5 discusses model uncertainties stemming from incomplete or incorrect models. These uncertainties are addressed by validation and confidence-building studies, as discussed in the TSPA documentation (DIRS 178871-SNL 2008, all) and its referenced documents. Many documents that support the TSPA address the identification of the types of data that are unavailable. It would not be practical to identify what data are unavailable in the SEIS. The analysis used the parameter distributions used as inputs in the analyses that support the components of TSPA to account for uncertainties in these parameters. Individual documentation of submodels of the TSPA discusses how these distributions are developed. This was done for hundreds of parameters. The probabilistic results of the TSPA reflect the consequences of data uncertainties.

The central purpose of the postclosure impacts analysis is to present the consequences of the long-term performance of the proposed repository. The analysis is not focused on finding an optimal design or comparing the relative merits of many design alternatives. To some extent, as the design has evolved, DOE has used the analysis to show whether particular design features offer improvements in long-term performance. In this way, DOE has changed the design of the repository to reduce postclosure impacts.

1.9 (4135)

Comment - RRR000737 / 0022

The commenter is opposed to the sole use of the TSPA to determine suitability and licensing of any site for permanent disposal of highly radioactive waste. He is suspicious of the large changes since the FEIS as the result of model refinements and feels the presentation of TSPA is not sufficiently transparent for understanding of how these refinements result in the changes. There is particular concern about linear extrapolation of very long-term processes. DOE should spell out a range in the results rather than a single number. The large spread of the data is not immediately apparent to the reader. The TSPA contains such a large number of parameters and is so complex that it is a very mutable technique allowing a wide range of results merely by making refinements. The commenter wanted to know how validation mentioned in Chapter 5 is accomplished since there are no data for comparison to model results. He also wondered why there was a shift to chromium +3 basis from the chromium +6 assumed in the FEIS. Since the repository is an oxidizing environment the +6 state seems more likely. DOE should explain the evidence leading to this conclusion and provide more accessible references.

Response

Total System Performance Assessment (TSPA) is the internationally accepted approach for assessing the performance of a repository. DOE has supported and participated in working groups that developed TSPA concepts for assessing long term repository performance. The Yucca Mountain TSPA model has undergone public scrutiny and extensive peer review, including by international experts, and is built from a large body of research and testing. An important part of the licensing process is for DOE to present corroborative evidence to enhance confidence in the TSPA projections of performance. Model validation activities have enhanced confidence in the TSPA model. These activities included corroboration of abstraction model results with the results of the validated mathematical model or process model from which the abstraction model was derived. Other validation analyses included comparison of the TSPA

model results with (1) deterministic analyses of single realizations from various modeling cases; (2) simplified TSPA analyses; (3) independent TSPA results produced by the Electric Power Research Institute and others, and (4) performance margin analyses to provide objective evidence for assessing performance margin and an estimate of the degree of conservatism in the TSPA model. Long-term projections of performance must address the potential for uncertainty in the parameters used to calculate the expected releases and, therefore, the results themselves. The TSPA model addresses uncertainties in the subsystem component models and data, and follows a rigorous regulatory approach to address uncertainty. The approach involved calculating the results over large ranges of parameter values to understand the statistical significance of the variability in the data. The SEIS shows the uncertainties in the results graphically.

The results of assessments of postclosure performance for this Repository SEIS and those of the Yucca Mountain FEIS are different. The differences are due largely to the standards the EPA has proposed to avoid speculation in the post-10,000-year calculation. Specific requirements about how to do such a calculation did not exist previously. Section 5.1.1 of the SEIS explains the reason for the differences in results between this SEIS and the FEIS.

Model validation is an established science dating back to computer analysis to support the early space program and nuclear power plants. An important aspect of validation is the principle that validation of the parts constitutes validation of the whole. Individual models of the TSPA can be validated against test data (normal and accelerated), theoretical science, and natural analogs (for long-term results). The validation activities for the TSPA in the SEIS included comparison of the relevant portions of the TSPA model with appropriate analogue information. Those comparisons included: (1) quantitative comparisons of the TSPA model components with analogous volcanic eruptive conditions (Cerro Negro), and (2) a detailed qualitative description of the groundwater flow and transport of radionuclides from a natural system (Peña Blanca) analogous to Yucca Mountain. This is the process referred to as “confidence building” in the SEIS. While complete validation is not possible, a large degree of partial validation has been accomplished. This is documented in the various reports that support the modeling efforts in TSPA (see references, particularly in Appendix F). In addition, if there is considerable uncertainty (as in making long-term extrapolations), a large measure of conservatism (that is, assumptions that overstate the risk) was employed in the estimates. Because of its complexity, the TSPA and its component parts are not easily assimilated by one person or even a small group of persons. The documentation of the TSPA integration tool is more than 3,500 pages long (DIRS 178871-SNL 2008, all). Each of the component parts is documented in other lengthy documents and in large databases. This is all a result of the necessary scope and complexity of the analysis. In the SEIS, DOE has provided summary information about the content of the TSPA so a reader of average background can gain some conceptual understanding of what is contained therein. Keeping the SEIS to a reasonable size demands this. A reviewer who wishes to review and understand the inner workings to the TSPA must review all the appropriate referenced documents in the SEIS and probably most of the references in the referenced documents.

The shift from a chromium +6 basis to a chromium +3 basis is supported by recent research concerned with soil and groundwater contamination of chromium, which has shown this is justified. Chromium +6 in solution is the result of the complete oxidation of chromium. The chemical environment needed to accomplish this is not only oxidizing but generally very low pH (very highly acidic). Such an environment is inconsistent with the repository system and most natural systems. Most chromium +6 contamination in the environment today is the result of releases from such systems as plating baths or semiconductor etching systems, which are typically very highly acidic. Once the chromium +6 form is in

solution, it becomes stable unless highly reducing and high pH environments are encountered. The ordinary corrosion of chromium-bearing steels and other alloys in air does not yield a significant amount of chromium +6, but rather typically chromium +3 is in solution. Appendix F, Section F.5.1 of the Repository SEIS contains this discussion and references. The references provide details about the environments for producing chromium +3 or +6. These references are readily available.

1.10 No-Action Alternative Impacts

1.11 Cumulative Impacts

1.11 (4191)

Comment - 10 comments summarized

Cumulative Impacts Analysis Inadequate - Transportation

Several commenters suggest the analysis of cumulative impacts was inadequate in its consideration of transportation and that DOE has not disclosed the full potential of future shipments through the U.S. to Yucca Mountain and with regard to GNEP.

Response

DOE has expanded the discussion of the Global Nuclear Energy Partnership and Greater-Than-Class-C waste in the Chapter 8 of the Repository SEIS and has identified specific repository- and transportation-related impacts that could be attributed to this program as it relates to Inventory Modules 1 and 2. At this point, there are no specific proposals that include accepting high-level radioactive waste from other countries; therefore, the evaluation of potential effects from GNEP in the Repository SEIS are associated only with the 130,000 MTHM of commercial spent nuclear fuel in Inventory Module 1.

Section 8.4 of the Repository SEIS presents the cumulative impacts of transporting spent nuclear fuel and high-level waste to the Yucca Mountain Repository for Inventory Modules 1 and 2. These modules include the cumulative transportation impacts of shipping the total projected inventory of spent nuclear fuel and high-level radioactive waste. In addition, Section 8.4 includes the health and safety impacts associated with known initiatives (past, present, and future) involving the transportation of other radiological materials across the country.

1.11 (4193)

Comment - 3 comments summarized

Cumulative Impacts of More than 70,000 MTHM

Several comments indicated the analysis of cumulative impacts should provide a technical basis for safe capacity of Yucca Mountain greater than 70,000 MTHM.

Response

DOE analyzed the emplacement of an expanded inventory of radiological materials (Inventory Modules 1 and 2) in addition to the Proposed Action as reasonably foreseeable future actions, as discussed in Repository SEIS Section 8.1.2.1. Cumulative impacts from the potential emplacement of Inventory Modules 1 and 2 are discussed by resource area in Repository SEIS Section 8.2. As specified in the Repository SEIS, DOE acknowledges the need for legislative action by Congress before disposal of any

wastes beyond the 70,000 MTHM limit analyzed in the Proposed Action. Any expansion of the capacity of Yucca Mountain would also be subject to the regulatory authority of the NRC. DOE would be required to submit an amended license for the expanded capacity. The Proposed Action does not involve any placement beyond 70,000 MTHM. DOE has made no assessment of the ultimate capacity of Yucca Mountain.

1.11 (4194)

Comment - 2 comments summarized

Analyze Modules 1 and 2

Commenters expressed concern that DOE continues to analyze Inventory Modules 1 and 2.

Response

The Repository SEIS evaluates the possibility that Congress could act to increase the capacity of Yucca Mountain. DOE analyzed the emplacement of an expanded inventory of radiological materials (Inventory Modules 1 and 2) in addition to the Proposed Action, as discussed in Section 8.1.2.1. Section 802 discusses cumulative impacts from the potential emplacement of Inventory Modules 1 and 2 by resource area. DOE acknowledges the need for legislative action by Congress before disposal of any wastes beyond the 70,000 MTHM limit analyzed in the Proposed Action.

1.11 (416)

Comment - RRR000071 / 0008

The commenter noted that DOE in the Repository SEIS considers the possibility of increased amounts of waste going to Yucca Mountain if the Global Nuclear Energy Partnership is adopted. This would expand domestic production to include international nuclear energy production, increasing current estimates of 70,000 metric tons of waste to be transported and disposed of to 130,000 metric tons.

Response

NEPA requires a federal agency to consider cumulative impacts an environmental impact statement. A cumulative impact, as defined under NEPA, results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Federal agencies are also required to evaluate reasonably foreseeable future actions in an EIS. Accordingly, the Repository SEIS evaluates these and uses the term “reasonably foreseeable” to refer to future actions for which there is a reasonable expectation that the action could occur, such as a proposed action under analysis, a project that has already started, or a future action that has obligated funding. As it did for the Yucca Mountain FEIS, DOE analyzed the emplacement of an expanded inventory of radiological materials (Inventory Modules 1 and 2) in addition to the Proposed Action as reasonably foreseeable future actions, as discussed in Repository SEIS Section 8.1.2.1. Cumulative impacts from the potential emplacement of Inventory Modules 1 and 2 are discussed by resource area in Repository SEIS Section 8.2. DOE acknowledges the need for legislative action by Congress before disposal of any wastes beyond the 70,000 MTHM limit analyzed in the Proposed Action would be allowed.

1.11 (495)

Comment - RRR000396 / 0026

Section 8 of the SEIS makes no mention of the potential impacts from a potential loss of the upward gradient in the LCA [Lower Carbonate Aquifer] on the TSPA of the Yucca Mountain. Limiting the

discussion of what impacts the repository will have on the environment versus impacts the environment may have on repository performance is not responsive to the goals of the NEPA process. The DOE should include a discussion on the significance of the upward gradient of the LCA on repository performance.

Response

The mechanism by which DOE evaluated the long-term, postclosure performance of the repository was the Total System Performance Assessment (TSPA) model described in Chapter 5 and Appendix F of the Repository SEIS. The TSPA modeling did not include a scenario that considered the upward gradient in the carbonate aquifer, but the factors that DOE considered and evaluated in the modeling effort basically bound such an occurrence.

As part of the efforts to develop the TSPA model, DOE evaluated (DIRS 174190-BSC 2005, all) a wide range of features, events, and processes that could affect flow and transport in the saturated zone. DOE screened the features, events, and processes to determine if they should in the model. For example, one of the features, events, and processes was a significant [up to about 300-meter (1,000-foot)] decline in the water table (DIRS 174190-BSC 2005, pp. 6-32 to 6-34). The evaluation concluded that the greater distance of travel in the unsaturated zone, the lower permeability of the volcanic aquifer at lower depths, and the likely lower hydraulic gradient would all act to slow contaminant travel times under such a scenario. As a result, DOE concluded that it did not have to carry this scenario into the evaluation of repository postclosure performance because it would not have an adverse effect on performance (that is, impacts would be smaller than those for the nominal case would). The Department also evaluated the TSPA flow model through a wide range of parameter uncertainties to determine impacts in model results if parameter values changed. For example, one of the parameters run at differing values was the relationship between horizontal and vertical permeability in the saturated zone, which was generally accepted to be in the range of 10 to 1 (that is, permeability in the horizontal direction being 10 times that in the vertical direction, causing water to move preferentially in the downgradient horizontal direction). The model was also run at a permeability ratio of 1 to 1, which is referred to as the removal of vertical anisotropy (DIRS 177391-SNL 2007, pp. 6-78 and 6-79). In this case, the modeled particles traveled deeper into the saturated zone, as expected, but the amount of material passing through specific boundaries did not change significantly from the base case. (The 10-to-1 ratio base case model provided more accurate results when compared to calibration points.) Both involve scenarios in which DOE modeled contaminants as reaching deeper in the saturated zone beneath Yucca Mountain than the nominal case scenario and neither resulted in greater impacts.

Although DOE's modeling did not include a specific scenario that involved the elimination of the upward gradient in the carbonate aquifer, the TSPA modeling encompasses the scenario in which future radionuclide migration from the repository would reach the springs in Death Valley, which is the primary reason this comment characterized the upward gradient as being so important. The general conceptual model of the regional groundwater flow system described in the Repository SEIS is that groundwater from beneath Yucca Mountain would move south into the Amargosa Desert and on toward Death Valley Junction and the discharge area of Alkali Flat/Franklin Lake Playa. Both Sections 3.1.4.2.1 and 5.4 of the SEIS recognize that groundwater flowing through the Amargosa Desert might contribute to Death Valley springs to the west and, therefore, those springs could be discharge areas for groundwater from beneath Yucca Mountain; that is, results of groundwater investigations show the potential for radionuclides migrating from the repository to reach Death Valley springs whether the upward gradient in the lower carbonate aquifer is maintained or not. DOE determined the impacts derived from the TSPA modeling

effort described in Chapter 5 of the SEIS primarily for a reasonably maximally exposed individual (RMEI) at a location about 18 kilometers (11 miles) south from the proposed repository [roughly 30 kilometers (20 miles) closer to the repository location than the Death Valley springs], which can be conservatively extrapolated to the springs in Death Valley at those locations. In other words, impacts at locations in Death Valley would not exceed the impacts at the RMEI location.

1.11 (930)

Comment - RRR000663 / 0008

Inadequate Analysis of the Proposed Action versus Module 1 and 2 Transportation Scenarios (no second repository)

The Draft Rail Alignment EIS fails to adequately consider the impacts of the Proposed Action versus the Inventory Module 1 and 2 transportation scenarios (no second repository) described in Section 8.4 of the Draft SEIS. Under Module 1, the estimated number of rail casks shipped to the repository would increase from 9,495 to 21,909 over the 50-year operations period. Under Module 2, the estimated number of rail casks shipped to the repository would increase from 9,495 to 24,112 over the 50-year operations period. Under Modules 1 and 2, the estimated number of truck casks shipped to the repository would increase from 2,650 to 5,025 over the 50-year operations period.

All of the impact analyses in the Draft Rail Alignment EIS must be revised to include side-by-side comparison of the expected impacts under the Proposed Action, Module 1, and Module 2. Revisions are required regarding impacts to land use and ownership; aesthetic resources; air quality and climate; surface water resources; groundwater resources; biological resources; noise and vibration; socioeconomics; occupational and public health and safety; utilities, energy, and materials; cultural resources; paleontological resources; and environmental justice.

Response

Section 8.1.2.1 of the Repository SEIS addresses Inventory Modules 1 and 2 in detail. Section 8.4.7 addresses the Rail Alignment EIS cumulative impacts. DOE has expanded the discussion of GNEP and GTCC in the Chapter 8 and has identified specific repository and transportation-related impacts that could be attributed to this program as it relates to Inventory Modules 1 and 2. Section 8.4.2 discusses Rail Alignment EIS cumulative impacts. Table 8-16 of the SEIS summarizes cumulative impacts, including preclosure impacts in the Yucca Mountain Repository region; postclosure impacts in the region; national transportation impacts; Nevada rail alignment transportation impacts; and manufacturing impacts.

1.11 (1445)

Comment - RRR000867 / 0001

The commenter expressed support for reprocessing as a way to reduce the waste to be stored at Yucca Mountain.

Response

Thank you for your comment. DOE has modified Chapter 8 of the Repository Final SEIS to address potential impacts of the GNEP program on Inventory Modules 1 and 2.

1.11 (1684)

Comment - RRR000836 / 0004

Insufficient information is provided in the ... drafts to assess the following concerns:

The Western Shoshone are concerned that there may be cumulative impacts to ground and surface water quality (including consequential impacts to humans, aquatic plants, avian life, animals, and the food chain) during construction of a geological nuclear waste repository and any rail line, as a result of the use of the repository or rail line, or as a result of any accidental release or terrorist attack. Impacts in association with these resources and conditions need to be further analyzed for the proposed actions for each alternative considered.

The Western Shoshone are concerned that there may be many cumulative impacts to the health of Native people who gather, consume, and use more wild game, fish, and plants for food, medicine, housing, clothing, implements, and art, than non-Indians. Impacts in association with these resources and conditions need to be further analyzed for the proposed actions for each alternative considered.

The Western Shoshone are concerned that there may be cumulative impacts to air quality (including impacts to humans, aquatic plants, avian life, and animals) both during construction of the repository and any rail line, and in the event of accident, accidental release, or terrorist attack, and also that there may be a potential for dispersal of radio-contaminants, rendering large areas uninhabitable. Impacts in association with these resources and conditions need to be analyzed completely for the proposed actions for each alternative considered. In a worst case scenario, with the types of radioactive material being transported, how long would it take for humans to gain re-entry into a contaminated area, which is still our sacred land?

The Western Shoshone are concerned that there may be cumulative impacts that have the potential to increase noxious weeds due to the construction disturbance and use of the repository and any rail lines. Impacts regarding noxious weeds on the proposed areas and contiguous areas that would be impacted by spread of those noxious weeds, including potential pesticide drift, need to be analyzed for the proposed actions for each alternative considered.

The Western Shoshone are concerned about the cumulative impacts of combinations of radionuclides with existing residual radiation, and with other hazardous chemicals or substances that might be carried on a multi-use rail line, especially in cases of accident, accidental release, or terrorist attach. Impacts in association with these combinations need to be analyzed for the proposed actions for each alternative considered.

The Western Shoshone are concerned that there may be cumulative impacts (including but not limited to impacts on social, spiritual, economic, psychological, cultural identity) to their Nation from the loss of use of their land and damage to cultural resources such as sage grouse, chuckwalla, desert tortoise, golden eagles, big horn sheep, deer, antelope, and wild horses, etc. Impacts in association with these resources and conditions need to be analyzed completely for the proposed action for each alternative considered, and the Western Shoshone National Council should be consulted.

Response

The cumulative impacts of each of the resource areas, including air, water, biological resources are addressed in Section 8.2 of this Repository SEIS. Cumulative Postclosure Impacts are addressed in Section 8.3 of the SEIS. The Repository SEIS is intended to update the Yucca Mountain FEIS. It provides detailed analysis when warranted by changes in reasonably foreseeable future actions from the actions in the Yucca Mountain FEIS. The SEIS evaluates the preclosure impacts of construction and operations of the repository in Chapter 4 and summarizes the impacts from construction and operation of the railroad in Section 6.4. These impacts are aggregated in Chapter 2 (Tables 2-2 through 2-6). In addition to the summary comparison of preclosure impacts of the repository and railroad in Chapter 2, the

SEIS evaluates the cumulative impacts of other reasonable foreseeable actions in the region in Chapter 8. Based on current information, DOE has concluded that construction, operations, monitoring and closure of the proposed repository would not result in any disproportionately high and adverse impacts to minority or low-income populations. In addition, DOE recognizes that American Indians believe that construction and operations of a repository at Yucca Mountain would have continuing adverse impacts for Native Americans who view the past, ongoing, and future repository-related activities as an intrusion on a culturally important and sacred landscape.

1.11 (1764)

Comment - RRR000657 / 0025

Comment: Section 4.3.4.4, page 4-127: This section discusses the Yucca Mountain Project Gateway Area Concept Plan and the Nye County perspective on cumulative impacts.

Resolution: No resolution is needed.

Response

Thank you for your comment.

1.11 (1790)

Comment - RRR000657 / 0037

Comment: Section 8.3.1, page 8-25: This section discusses a scaling approach to Inventory Modules 1 and 2.

Resolution: No resolution is required. A common sense approach is used for scaling the 70,000 metric tons of heavy metal (MTHM) repository impact estimates to estimates for Inventory Modules 1 and 2. Such a straightforward and reasonable approach is easily explained and understood.

Response

Thank you for your comment.

1.11 (1895)

Comment - RRR000525 / 0010

NARUC SEIS 4 Page S-7 70,000 MTHM Repository Scope

The proposed action in this SEIS is to develop and operate a repository at Yucca Mountain for the disposal of 70,000 metric tons (MTHM) of spent fuel and other high-level radioactive waste, per the statutory capacity limitations in the NWPA. Even if Congress were to enact the *Nuclear Fuel Management and Disposal Act* with the proposed repeal of that capacity limit, that bill has not been passed. Although the SEIS assesses the environmental impacts of two inventory module quantities greater than 70,000 MTHM, they are recognized as contingency analyses. We have seen comments by repository opponents related to transportation in which the shipment quantities are cited from the inventory modules rather than the proposed action level of transport activity.

Response

The Repository SEIS states: "As stated in the Yucca Mountain FEIS, DOE acknowledges the need for legislative action by Congress before these actions [Emplacement of two inventory module quantities greater than 70,000 MTHM, Inventory Modules 1 and 2] could occur."

1.11 (1929)

Comment - RRR000525 / 0019

NARUC SEIS 13 Page S-46 Global Nuclear Energy Partnership

We agree that the potential development and deployment of reprocessing of spent nuclear fuel under the Global Nuclear Energy Partnership or similar program is too speculative at this stage to consider a change in the quantity and characteristics of material to be emplaced in the repository that would be different than that presented in this SEIS.

Response

Thank you for your comment. However, in light of the development of alternatives for the GNEP Programmatic EIS, DOE has modified Chapter 8 of the Repository SEIS to address potential impacts of the GNEP program on Inventory Modules 1 and 2.

1.11 (2374)

Comment - RRR000522 / 0012

Chapter 8 of the Repository DSEIS fails to analyze any cumulative impacts associated with the 2,700 truck shipments of SNF/HLW [spent nuclear fuel/high-level radioactive waste]. As a consequence, no NEPA coverage exists to support the DOE decision to utilize a mostly rail modal choice involving 1,800 more truck shipments than was analyzed in the Yucca Mountain FEIS.

Response

DOE based the evaluation of cumulative transportation impacts associated with Inventory Module 1 on a scaling approach. This approach scales up the estimated impacts from the Proposed Action based on the updated estimate of shipments necessary to accommodate the Inventory Module 1 volumes of spent nuclear fuel and high-level radioactive waste. Because the impacts from the Proposed Action would include those associated with the 2,700 truck shipments, the impacts associated with Inventory Module 1 would account for the increased number of estimated truck shipments associated with the module. Table 8-13 of the Repository SEIS summarizes the analysis of truck shipments.

1.11 (2392)

Comment - RRR000664 / 0046

The Repository Draft SEIS's cumulative impacts analysis is deficient in a number of respects. DOE posits that it is possible and necessary to see thousands of years into the future to predict the integrity of the repository, but is unwilling to use today's methodologies and resources to predict the obvious trends in population and growth in the southern Nevada area that are likely to affect the repository's proximity to population centers.

The Draft SEIS needs to incorporate the most current demographic projections available from the State of Nevada and local governments in their assessment of cumulative impacts. See Eureka County Socioeconomic Conditions and Trends, 2006 (http://www.yuccamountain.org/trends06/cover.htm).

The DSEIS description of Reasonably Foreseeable Future Actions seriously under estimates future growth pressures throughout southern Nevada (DSEIS 8.1.2, p 8-3). While Nevada has continued to experience the highest growth levels within the nation for over a decade, 85 percent of its land is managed by the federal government. This has repeatedly put inflationary pressures on land values and is already resulting in significant residential growth in the areas north and west of the Las Vegas Valley. Continued

growth within southern Nevada is expected over the next twenty years. This will increase growth in all surrounding counties including Eureka as residents seek more affordable housing. While DOE has incorporated more up to date population numbers within the DSEIS then were utilized in the FEIS, the demographic growth is still significantly under forecast.

The Draft EIS fails to thoroughly assess cumulative impacts from other DOE activities (that is, low-level radioactive waste, mixed LLW [low-level radioactive waste] and hazardous waste, and transuranic waste activities at NTS [Nevada Test Site]; other ongoing or planned DOE programs at the NTS; past weapons testing activities at NTS; commercial/private industry activities at/near the NTS), ranching; mining; any planned highway or other infrastructure activities ongoing or planned for the area surrounding the proposed rail line; and any and all other existing or reasonably foreseeable activities that might affect or be affected by the proposed action.

Response

The REMI computer program incorporates the most current and local data. The most recent estimates from the Nevada State Demographer reflect the recent high-level growth of the state and the two counties, Nye and Clark, in the region of influence. The high-level growth estimates create bounding circumstances for the baseline. 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. The Bureau bases Census information 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, because of the use of different methods, source data, level of detail and terminology. In addition, Bureau of the Census information is readily available. The software program (REMI) DOE used to estimate the baseline and changes above and below the baseline for the five economic variables included in the socioeconomic analysis incorporates the Nevada State Demographer's population estimates and forecasts and those of the University of Nevada, Las Vegas.

Predicting residential distribution patterns is speculative. Trends in population are not obvious, because the "trend" is defined by the timeframe that bounds the observation—is the trend a product of the last 18 days, 18 months, 18 years, 18 decades, etc.? For example, the socioeconomic environment in southern Nevada in the last 18 months (leading the Nation in foreclosures, bankruptcy, decline in new home and resale home volume, drop in median house prices, length a house is on the market etc) is very different from that the last 18 years (one of the Nation's fastest growing areas; a modestly expensive, relatively speaking, area; and a very large service industry).

Section 8.1.2.2 and Table 8-3 of the Repository SEIS discuss in detail the environmental assessments for reasonably foreseeable future actions at the Nevada Test and Training Range. They summarize the proposed actions and potential environmental impacts and provide references. The environmental assessments identified no potential environmental impacts. Table 8-16 of the SEIS summarizes potential cumulative impacts.

Section 8.1.2.3 and Table 8-4 of the Repository SEIS discuss in detail the environmental assessments for reasonably foreseeable future actions at the Nevada Test Site. They summarize the proposed actions and potential environmental impacts and provide references. The environmental assessments identified no potential environmental impacts. Table 8-16 of the SEIS summarizes potential cumulative impacts.

Section 8.1.2.4 of the SEIS discusses four EISs.

DOE has worked with Nye County to obtain the most reasonably foreseeable future actions, as discussed in Section 8.1.2.5 of the Repository SEIS, which include the Gateway Area Concept Plan, Desert Space and Science Museum, and U.S. Highway 95 Technology Corridor. Section 8.6.2 of the SEIS presents Nye County's viewpoint.

1.11 (2421)

Comment - RRR000686 / 0005

Clearly there will be impacts to cultural, spiritual and historical areas of the Western Shoshone people on their ancestral lands. These will include but not limited to: impacts to human life, water sources, wildlife, plants (native, medicinal, and edible), hunting, and fishing areas, sensitive and protected species, air contamination. The data provided to the public does not address these vital issues. In addition, what consideration and analysis has been completed regarding the cumulative impacts to these areas of concern in the areas in and affected by the project?

Response

The Yucca Mountain FEIS reported that there would be no cumulative impacts on delineated American Indian sites, areas, and resources in or immediately adjacent to the analyzed land withdrawal area. Because of the general level of importance that American Indians attribute to these places, which they believe are parts of an equally important integrated cultural landscape, American Indians consider the intrusive nature of the proposed repository to be a significant adverse impact to all elements of the natural and physical environment. The cumulative impacts analyses followed NEPA and considered any cumulative impacts resulting from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Section 8.2 of the Repository SEIS discusses all potential impacts to each of the resource areas. In the Yucca Mountain FEIS, DOE summarized the American Indian view of resource management and preservation, which is holistic in its definition of cultural resources and incorporates all elements of the natural and physical environment in an interrelated context. In the FEIS, DOE committed to continue the Native American Interaction Program throughout the implementation of the Proposed Action to enhance the protection of archaeological sites and cultural items important to American Indians. Based on tribal update meetings for members of the Consolidated Group of Tribes and Organizations since the completion of the Yucca Mountain FEIS, the American Indian viewpoint is unchanged.

1.11 (2452)

Comment - RRR000681 / 0036

8.4.2.6, Groundwater Resources. "Based on the proposed locations of new wells in specific hydrographic areas along the Caliente Rail Alignment, additional groundwater appropriations would be needed in 19 hydrographic areas." (8-40). The DOE states that overall the needs for the railroad represent a small portion of the cumulative water usage in the region of influence. How is this quantified?

Response

Section 8.4.2 of the Repository SEIS is a summary of the cumulative impacts of the Rail Alignment EIS, which contains more detail about the development of these values. The statement in Section 8.4.2.6 of the SEIS is a summary of the information in Table 4-60 and Section 4.2.6.2.1 of the Rail Alignment EIS. Table 4-60 lists, for each hydrographic area the Caliente rail alignment would cross, the perennial yield of

the area, the total annual volume of committed resources from that groundwater area or basin, and the volume of the water demand associated with the applicable portion of the rail alignment. In almost all of the hydrographic areas, existing water use, as estimated by the committed resource volumes, are notably greater than the water demand associated with the rail alignment. Similarly, Section 4.3.6.2.1 and Table 4-206 of the Rail Alignment EIS present groundwater impacts for the Mina rail alignment.

Section 5.2.2.6 of the Rail Alignment EIS provides a description and analysis of the 19 hydrographic basins and the cumulative impacts to groundwater resources.

As with all major construction projects, the building and operation of a rail line would require an adequate supply of water. This water would be necessary for compaction of earthen materials during construction of the rail alignment berm, for protection of the health and safety of workers through control of dust, for support of operations at facilities during or following rail line construction, and for emergency use such as fire suppression during rail alignment construction and during rail line operations.

As described in Section 4.2.6.2 of the SEIS, the groundwater impacts assessment included identification of existing springs, existing seeps, and other surface water rights, wells with water rights, and domestic wells within a 1.75-mile radius around each proposed new well location and within a 6-mile radius around each new potential well location that could be associated with a (water-bearing) fault zone, based on review of the Nevada Division of Water Resources online water rights and well log databases and other available databases including the U.S. Geological Survey National Water Information System and the GNIS-Nevada Springs databases and published reports. The impact analyses included consideration of these existing resources in these specified search areas around each proposed new well. DOE has expanded the description in Appendix G of the methodology it used to identify these features.

To assess potential impacts due to well water withdrawals, DOE (conservatively) assumed that it would acquire all water for rail line construction and operation from new wells. If the impacts analysis determined the necessity to preclude impacts on an existing well, spring, or other surface-water right, DOE would reduce pumping rates or would eliminate pumping at a proposed new groundwater withdrawal well. The Department could purchase additional water from existing water-rights holder(s), relocate the new well location to preclude impacts to an existing water-rights holder or other groundwater resource feature, or implement one or more best management practices. As an alternative, DOE could implement the proposed pumping at the required pumping rate and negotiate with the existing water-rights holder or domestic water-well owner to access and monitor water levels in the existing well or monitor discharge rates to the spring, where appropriate, to verify the effects, if any, of the proposed groundwater withdrawal on those wells or springs. Chapter 7 of the Repository SEIS lists mitigation measures for impacts to springs that cannot be avoided.

DOE would follow all applicable requirements under state water law in Nevada Revised Statute Section 533 in applying for and acquiring water rights for all phases of the Nevada rail line and ancillary facilities. DOE is not considering other alternatives for acquiring necessary water at this time.

1.11 (2453)

Comment - RRR000681 / 0037

8.4.2.4 Air Quality and Climate "Potential cumulative impacts to Air Quality and climate and construction and operation of the proposed railroad along the Caliente or Mina Rail alignment would be small, but could approach moderate if the potential exceedence of the National Ambient Air Quality Standards note above occurred."(8-39). Does the DOE mean 'moderate' as designated by the Environmental Protection Agency? Clark County is designated nonattainment for certain criteria

pollutants, but DOE does not appear to have evaluated how the proposed repository and rail line will impact Clark County's air quality attainment status.

Response

Section 8.4.2 of the Repository SEIS is a summary of the cumulative impacts of Nevada rail transportation, as described in the Rail Alignment EIS. The Rail Alignment EIS used the following descriptors to characterize impacts qualitatively if quantification of impacts was not practical:

- Small- For the issue, environmental effects would not be detectable or would be so minor that they would neither destabilize nor noticeable alter any important attribute of the resource.

- Moderate- For the issue, environmental effects would be sufficient to alter noticeably, but not to destabilize important attributes of the resource.

- Large- For the issue, environmental effects would be clearly noticeable and would be sufficient to destabilize important attributes of the resource.

Sections 4.2.4 and 4.3.4 of the Rail Alignment EIS contain more detail about the development of these values. The region of influence for the air quality analysis was limited to the counties through which the rail line would traverse because the impacts from the rail construction and /or operation on Clark County air quality attainment status would be small.

1.11 (2766)

Comment - RRR000688 / 0046

The commenter is opposed to DOE's work with the Global Nuclear Energy Partnership (GNEP) because of the expansion of domestic and international nuclear energy production. She asked why DOE is not partnering with wind and solar energy programs instead.

Response

Except to the extent that DOE analyzes the potential spent nuclear fuel and high-level radioactive waste inventories from the GNEP program in the Repository SEIS (see Sections 8.1.2.1 and 8.1.2.4.1), the need for that program is outside the scope of this SEIS. DOE has many energy initiatives beyond nuclear power, including wind and solar energy. For more information, visit www.energy.gov; www1.eere.energy.gov/solar; and www1.eere.energy.gov/windanadhydro.

1.11 (3006)

Comment - RRR000681 / 0004

Cumulative impacts to Clark County have not been adequately addressed in the DSEIS. The DSEIS does not meet the requirements for addressing such impacts under NEPA. "NEPA requires that where several actions have a cumulative or synergistic environmental effect, this consequence must be considered in an EIS." Sierra Club v. Penfold, 857 F.2d 1307, 1320-21 (9th Cir. 1988) ("cumulative impact is defined in 40 CFR 1508.7 (1989)). It is the authoring agency's duty to "consider every significant aspect of the environmental impact of a proposed action and evaluate different courses of action." Baltimore Gas v. NRDC, 462 US 87, 97, 103 S.Ct. 2246 (1983). The cumulative analysis presented must provide

sufficient information to indicate DOE has taken a "hard look at the cumulative environmental impacts of the project." Oregon Natural Resources Council v. Marsh, 52 F.3d 1485 (9th Cir. 1995)

The White House Council on Environmental Quality (CEQ) went so far as to actually list eight different types of cumulative effects that ought to be examined: 1) Time Crowding; 2) Time lags; 3) Space Crowding; 4) Cross Boundary; 5) Fragmentation; 6) Compounding Effects; 7) Indirect Effects and 8) Triggers and Thresholds. See Council on Environmental Quality (1997).

The cumulative impacts analysis in the DSEIS is deficient in a number of these respects. The DSEIS description of "Reasonably Foreseeable Future Actions" seriously underestimates future growth pressures throughout southern Nevada (DSEIS 8.1.2, pg 8-3). While Nevada has continued to experience the highest growth levels within the nation for over a decade, 85 percent of its land is managed by the federal government. This has repeatedly put inflationary pressures on land values and is already resulting in significant residential growth in the areas north and west of the Las Vegas Valley. Clark County's population has increased by more than 5,000 people every month since the early 1990's. Continued growth within southern Nevada is expected for more than twenty years. Clark County's current population is 2 million, and is expected to increase to 3 million by the time the first Yucca Mountain shipment is anticipated. In addition to this explosive population growth, visitor populations continue to increase. On any given day, 250,000 visitors are in the Las Vegas area. McCarran Airport, the sixth busiest in the country, is owned and operated by Clark County. Over the next five years, airport traffic is expected to increase to over 50 million annual passengers, up from the current level of 46 million. Planned expansion of airport operations in the south county's Ivanpah Valley will be directly impacted by transportation to the repository, due to its proximity to Interstate Highway 15 and the Union Pacific Railroad main line, yet this has not been addressed in the NEPA documents. For that matter, potential impacts to McCarran Airport operations, located in close proximity to the Las Vegas Beltway and Interstate Highway 15, have also not been addressed.

These demographic considerations are not given adequate consideration in the DSEIS.

Response

The socioeconomic cumulative impacts analyses incorporated the most current, local data in the REMI inputs. The most recent estimates from the Nevada State Demographer reflect the recent high-level growth of the state and the two counties, Nye and Clark, in the region of influence. The high-level growth estimates create bounding circumstances for the baseline. For example, the socioeconomic environment in southern Nevada in the last 18 months (leading the Nation in foreclosures, bankruptcy, decline in new home and resale home volume, drop in median house prices, length a house is on the market, etc.) is very different from that the last 18 years (one of the Nation's fastest growing areas; a modestly expensive, relatively speaking, area; and a very large service industry).

Predicting future residential distribution is speculative because the criteria buyers and renters use to select housing locales change often (affordability, good schools, access to amenities, weather, infrastructure, or personal safety, for example). The general flight from farm to city to suburb to a return to the country life demonstrates this. Therefore, future residential distribution patterns are generally described in terms of broad geographical areas.

Governments are able to control, discourage, or encourage development patterns through land use plans, zoning, tax abatements, industry subsides, set-asides, building codes, provision for or presence of infrastructure, leadership, etc. The local government's approach to the mentioned tools generally reflects the attitude of the constituency because the government has a fiduciary duty to represent those

philosophies. The private market has an incentive to make good, sound decisions (including how much, of what type, and at what price to offer housing in Nevada) for economic profit.

1.11 (3007)

Comment - RRR000681 / 0005

The DSEIS also falls short in its assessment of potential cumulative impacts as they relate to Nellis Air Force Base. For many years, Nellis Air Force Base (including the Creech Air Force Base and the Nevada Test and Training Range) has been a significant contributor to the nation's defense capabilities as well as an important contributor to Nevada's economy. The Department of Defense has consistently expressed concern over impacts to Air Force operations as a result of proposed operations at the repository site as well as transportation to the repository adjacent to or potentially traversing Air Force property. In addition, potential impacts to the rural community of Indian Springs have not been specifically addressed. Indian Springs, the closest Clark County community to Yucca Mountain, is located directly across U.S. Highway 95 from Creech Air Force Base. Any major mission alteration that moves Air Force operations closer to Indian Springs will likely impact the quality of life of the residents of the community. Further, Nevada Test Site operations already impact this community, which must prepare and respond to potential transportation incidents while relying on Clark County's volunteer public safety personnel. Despite repeated calls for better analysis and acknowledgment of the potential for aircraft crashes from Air Force operations, the DOE has not yet adequately addressed this issue critical to public safety and homeland security.

Response

DOE has included the most recent information available on the reasonable foreseeable future actions at the Nevada Test and Training Range and the Nevada Test Site. Section 8.1.2.2 and Table 8-3 of the Repository SEIS discuss in detail the environmental assessments for reasonably foreseeable future actions at the Nevada Test and Training Range. They summarize the proposed actions and potential environmental impacts and provide references. The environmental assessments identified no potential environmental impacts. Table 8-16 of the SEIS summarizes all potential cumulative impacts.

Section 8.1.2.3 and Table 8-4 of the SEIS discuss in detail the environmental assessments for reasonably foreseeable future actions at the Nevada Test Site. They summarize the proposed actions and potential environmental impacts and provide references. The environmental assessments identified no potential environmental impacts. Table 8-16 of the SEIS summarizes all potential cumulative impacts.

The U.S. Air Force is a cooperating agency on the Rail Alignment EIS and DOE consulted it during the preparation of the Yucca Mountain FEIS. The Proposed Action presents no conflicts with current or planned operations of the Air Force.

1.11 (3030)

Comment - RRR000661 / 0018

Inventory Modules 1 and 2. On the grounds that legislative action would be required, the SEIS classifies the effects of inventory modules 1 and 2 as a cumulative impact (Section S.5), and scales up the national transportation impacts, using the assumptions and methods applied to the proposed action (Section 6.3.1, Section 8.4.1). Inventory modules 1 and 2 double the commercial spent fuel in the proposed action, and nearly quadruple the amount of DOE high-level waste that would be delivered for disposal at Yucca Mountain.

The 130,000 MTHM [metric tons of heavy metal] of commercial spent fuel in modules 1 and 2 is arguably a more "reasonably foreseeable" expectation than the 63,000 MTHM in the "proposed action." The SEIS suggests that, having determined that the nation's first geologic repository would be in the West, and then having indefinitely postponed a second repository in the East, the cross-country transportation impacts of shipments beyond the current 70,000 MTHM limit can be estimated by scaling up those for the proposed action. ... [T]he assessment methods used in the SEIS do not address the dimensions that make cross-country transport of SNF [spent nuclear fuel] the complex issue and concern that it obviously is. These dimensions have particular application to the prospect that all current and prospective SNF generated by the nuclear power industry, not just the portion specified in NWPA Section 114(d) would be shipped an average distance of 2,500 miles for disposal in the West.

The SEIS should acknowledge the limitations of its methods for assessing transportation impacts ... as applied to the proposed action, and the further limitations (for example, regarding regional equity, trust in deciding and implementing federal institutions) as applied to inventory modules 1 and 2.

The "proposed action" assumes that cross-country transportation is limited by NWPA Section 114(d), which "provides that no more than 70,000 MTHM of spent nuclear fuel and high-level radioactive waste may be disposed in a first repository until a second repository is operating." (Section S.5.1, page S-47) Inventory module 1 assumes legislative action that would increase the amount to be disposed in a first repository to about 150,000 MTHM. Inventory module 2 adds in 210,000 cubic meters of Greater-Than-Class-C and Special-Performance-Assessment-Required wastes.

Response

DOE has acknowledged the need for legislative action by Congress before disposal of any wastes beyond the 70,000-MTHM limit analyzed in the Proposed Action. As in the Yucca Mountain FEIS, DOE analyzed the transportation and emplacement of an expanded inventory of radiological materials in addition to the Proposed Action (Inventory Modules 1 and 2) as reasonably foreseeable future actions, as discussed in Section 8.1.2.1 of the Repository SEIS. Section 8.2 discusses cumulative impacts from the potential emplacement of Inventory Modules 1 and 2 by resource area. Section 8.4 presents cumulative transportation impacts. In relation to regional equity, DOE has implemented the NWPA, and the SEIS is part of the implementation.

1.11 (3037)

Comment - RRR000681 / 0006

Both rural and urban land use conflicts and evolving trends in land use are not adequately considered in the DSEIS. Cumulative impacts will be exacerbated as land use density increases. Growth patterns and trends in Clark County reflect a shift from "rural" to "suburban" in several of Clark County's outlying communities, many of which are located adjacent to potential transportation routes. Further, the established trend towards "mixed use" and "high impact projects" along the Las Vegas Strip increase the potential for risk of human exposure to radiation within the region of influence that will be impacted by shipments to Yucca Mountain. Clark County public safety studies, including its March 2007 Commodity Flow Study, clearly establish a basis for concern over cumulative impacts.

Response

The socioeconomic cumulative impacts analyses incorporated the most current local data in the inputs to the REMI computer model. The most recent estimates from the Nevada State Demographer reflect the recent high-level growth of the state and the two counties, Nye and Clark, in the region of influence. For

example, the high-level growth estimates create bounding circumstances for the baseline. The socioeconomic environment in southern Nevada in the last 18 months (leading the nation in foreclosures, bankruptcy, decline in new home and resale home volume, drop in median house prices, length a house is on the market, etc.) is very different than the last 18 years (one of the nation fastest growing areas, a modestly expensive, relatively speaking, area, very large service industry).

Section 8.4 of the SEIS presents the cumulative impacts of transporting spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Repository for Inventory Modules 1 and 2.

1.11 (3148)

Comment - RRR000121 / 0011

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Cumulative impacts result from additional burdens created when Western Shoshone land use is further reduced, plant resources are diminished, non-Native American presence increases and additional Western Shoshone cultural resources are disturbed or removed.

Cumulative and synergistic adverse impact on Native American health and tribal environment.

Response

DOE has concluded that construction, operations, monitoring and closure of the proposed repository would not result in any disproportionately high and adverse impacts to minority or low-income populations, DOE also understands that the American Indian perspective is that it does. The cumulative impacts analyses followed NEPA and considered cumulative impacts from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Section 8.2 of the Repository SEIS discusses potential impacts to each resource area.

DOE understands that the Yucca Mountain site is in the historic ancestral territory of the Western Shoshone and that the Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them the rights to certain lands, including the Yucca Mountain region. DOE acknowledges that people from many American Indian 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. With regard to American Indian views on what are “acceptable impacts” to nature, DOE understands through the Native American Interaction Program that American Indians view the environment in holistic and integrated terms and that the repository program and its components conflict with that view.

Consistency with cultural resource and American Indian-related laws has been an integral component of the Yucca Mountain Program since the early 1980s. Through the ongoing Native American Interaction Program, DOE considers American Indian viewpoints appropriately by relying on the results of its long-term and ongoing interactions with tribal representatives about Yucca Mountain, and by identifying potential impacts to historic and other cultural resources important to sustaining and preserving their cultures.

DOE has maintained a Native American Interaction Program with 16 tribes and 1 organization since the mid-1980s. The program is part of DOE’s implementation of CEQ Guidance on Environmental Justice that agencies should recognize the interrelated cultural, social, occupational, historic, or economic factors

that might amplify the natural and physical environmental effects of the proposed agency action. Appointed tribal representatives sit on a DOE-funded, self-organized committee called the Consolidated Group of Tribes and Organizations. While the Group does not support the potential use of Yucca Mountain as a repository, it has agreed to be involved in an honest and participatory process. DOE will continue to support the Group and the Native American Interaction Program.

During preparation of the Yucca Mountain FEIS, DOE interacted with 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), which the Department used as a reference for the FEIS and this Repository SEIS.

1.11 (3694)

Comment - RRR000524 / 0005

2. Comment:

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

Basis:

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

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

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

References:

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

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

Response

Like the Yucca Mountain FEIS it supplements, the Repository SEIS evaluates other water uses in the Alkali Flat-Furnace Creek groundwater basin and, specifically in that basin, the Jackass Flats hydrographic area. The Nevada Test and Training Range is outside the Alkali Flat-Furnace Creek basin, as is much of the Nevada Test Site. In the Yucca Mountain FEIS, the only Nevada Test Site water demand of concern was that from the Jackass Flats hydrographic area for Area 25 use, because that is the same hydrographic area from which the Yucca Mountain Project would withdraw water.

Groundwater moves between the various basins in the Death Valley regional groundwater flow system, but how much outside basins contribute to the Alkali Flat-Furnace Creek basin is a matter of speculation. It is reasonable to assume that all water demand in the single basin is cumulative, but it becomes problematic to describe how Nevada Test and Training Range water demand outside the basin affects groundwater availability inside the basin (if it does).

The identified region of influence for groundwater (in which water demand can reasonably be assumed to be cumulative) includes the areas of Buckboard Mesa/Fortymile Canyon (with no current or future water demand), Jackass Flats, Crater Flats, and the main portion of the Amargosa Desert. Searching outside this area for other groundwater users is speculative for determining how, or to what degree, they would be cumulative.

Section 8.2.3.2 of the Repository SEIS discusses water demand from rail and repository actions at the start of construction activities under Inventory Module 1 or 2 combined with the baseline demands from the Nevada Test Site. Since DOE completed the Yucca Mountain FEIS, it has reviewed documentation on several Nevada Test and Training Range and Nevada Test Site environmental assessments (see Tables 8-3 and 8-4 of the SEIS). These documents identified no potential environmental impacts. Because the projects described in the documents would be unlikely to involve significant impacts to water requirements or would be in areas outside the Alkali Flat-Furnace Creek basin (or both), DOE did not try to determine if water demand would be involved. The Department has added text to Chapter 8 of the SEIS to describe the screening it performed to identify actions with potential cumulative groundwater impacts.

Section 8.1.2.2 and Table 8-3 and Section 8.1.2.3 and Table 8-4 of the Repository SEIS discuss in detail the environmental assessments for reasonably foreseeable future actions at the Nevada Test and Training Range and the Nevada Test Site, respectively. They summarize the proposed action and potential environmental impacts and provide references for each environmental assessment. The environmental assessments identified no potential environmental impacts. Table 8-16 summarizes all potential cumulative impacts.

Section 8.1.2.4 of the Repository SEIS discusses and analyzes the four EISs to the extent information is available.

DOE has worked with Nye County to determine the most reasonably foreseeable future actions, which are discussed in Section 8.1.2.5 of the Repository SEIS, and include details on the Yucca Mountain Project Gateway Area Concept Plan, Desert Space and Science Museum, and U.S. Highway 95 Technology Corridor. Section 8.6.2 of the SEIS presents Nye County's viewpoint.

1.11 (3703)

Comment - RRR000642 / 0015

The DSEIS should provide the upward bounds or maximum capacity for spent fuel and high-level waste disposal at the repository and the implications for shipments in California.

It has been estimated that 140,000 metric tons of spent fuel and defense waste would be generated if all US reactors are given 20-year license extensions. (Approximately half of the US reactors have received license extensions.) The DSEIS should define the maximum number of waste shipments that could potentially be transported to the repository, including assuming that all US reactors receive 20-year license extensions and assuming the potential for new reactor construction in the US. The Proposed Action is for a 70,000 metric tons capacity repository. The DSEIS considers Modules 1 and 2 at 130,000 metric tons of commercial spent nuclear fuel in the expanded capacity case. However, no discussion is provided on a proposed underground layout for how the expanded capacity could be accommodated.

The period of analysis for shipment impacts should also consider a larger repository capacity scenario. The DSEIS should provide the maximum capacity for spent fuel and high-level waste at the repository given the large amount of spent fuel and defense waste generated for the current fleet of reactors and DOE facilities as well as estimated new reactors planned for construction in the US. New reactor license applications have been submitted to the US Nuclear Regulatory Commission with strong industry and federal support and incentives encouraging additional new nuclear power reactors. The SEIS should discuss the maximum and likely number of rail and truck shipments to the repository should the *Nuclear Waste Policy Act* be amended to expand the repository capacity beyond its current statutory limit of 70,000 metric ton. If DOE plans to include an expanded repository capacity as a reasonably foreseeable future action, it should provide the technical basis and safety evaluation, including cumulative impacts, supporting a decision for additional repository capacity.

Response

As discussed in the Yucca Mountain FEIS (Section 8.1.2.1), the repository subsurface facilities for Inventory Module 1 or 2 would require about twice the subsurface excavation of the Proposed Action. If DOE was to propose to dispose of Inventory Module 1 or 2, it would characterize this additional subsurface area, which would be adjacent to the blocks identified for the Proposed Action. To clarify, DOE evaluated 130,000 MTHM of projected commercial spent nuclear fuel, 2,500 MTHM of DOE spent nuclear fuel and approximately 36,000 canisters of high-level radioactive waste rather than 140,000 metric tons of spent fuel and defense waste.

Like the Yucca Mountain FEIS it supplements, the Repository SEIS evaluates the potential geologic disposal of the spent nuclear fuel discharged from all currently licensed commercial reactors (assuming a 20-year life extension) which is considered to be a reasonably foreseeable action.

Section 8.4 of the SEIS presents the cumulative impacts of transporting spent nuclear fuel and high-level waste to a repository at Yucca Mountain for Inventory Modules 1 and 2. These modules include the cumulative transportation impacts of shipping the total projected inventory of spent nuclear fuel and high-level radio active waste.

1.11 (3825)

Comment - RRR000851 / 0001

The cumulative impacts assessment appears abbreviated and incomplete, based on CEQ guidelines. No approved thresholds for the potential contaminants and/or pollutants associated with the proposed action are presented or compared within the document. Further, neither a geographic nor temporal scale for the context of cumulative impact evaluations of ANY variety is clearly established; i.e. this document provides nothing in the way of cumulative impacts analysis except for vague predictory statements and unsubstantiated (within the document itself) risk values. At a minimum, based on a review of the subject document and precursors, as well as CEQ guidelines, the subject document should be further revised to include the following topics:

1) Cumulative human health risk evaluations for all aspects of the proposed action and required transportation, materials handling with detailed attention to historic accident rates for all potential hazards posed, as is practical for period of record data (i.e. from day 1 of recorded human-nuclear waste interaction), population center health risks and associated economic effects for all populated areas involved—regardless of density, drawing not only on normal expected exposure levels but providing overviews of potential impacts, even if deemed unlikely.

2) Cumulative impacts to all associated groundwater resources, in light of current use as well as expected groundwater utilization increases. Further evaluation should describe these cumulative impacts to groundwater in light of other Federal, State, local, and tribal initiatives and proposed uses.

3) Cumulative impacts to all ecosystems, wildlife, and natural resources should be presented in a clear geographic and temporal context, with relevant thresholds and predictions based on best available data, with particular detail provided regarding long-term impacts to ecosystem stability, direct human utilization of resources, and broader implications for regional resource consumption and trade. Seismic activity, as an obvious geologic process-regulating force within these ecosystems, should be evaluated and results fully integrated with other cumulative impact risk scenarios, that is, seismic activity at varying strengths and frequencies should be a modeled factor when attempting to evaluate ecosystem impacts.

4) Cumulative impacts should focus on potential impacts to cultural and historic resources; the subject document is devoid of real evaluation of potential impacts to nearby tribal lands, tribal members, and US-tribal relationships.

Response

The Repository SEIS supplements the Yucca Mountain FEIS. The SEIS provides detailed analytical analysis warranted by changes in reasonably foreseeable future actions from the actions in the FEIS. For the specific areas mentioned in the comment:

Section 8.2.7 provides a quantitative assessment of the occupational public health and safety impacts from the repository and other reasonably foreseeable action, including Inventory Modules 1 and 2. Section 8.4.1.5 provides a quantitative presentation of impacts associated with national transportation of radiological materials.

Section 8.2.3 of the Repository SEIS supplements the Yucca Mountain FEIS discussion of the hydrology impacts related to reasonably foreseeable future actions.

Section 8.2.4 of the Repository SEIS assesses the cumulative preclosure impacts to biological resources and concludes that they would be similar to those for the Proposed Action.

Section 8.2.5 of the Repository SEIS discusses cultural resources impacts.

1.11 (3973)

Comment - RRR000995 / 0006

The commenter questioned the implications of disposal of Greater-Than-Class-C low-level radioactive waste on the Yucca Mountain Project. Specifically, he questioned if the Module 2 inventory addressed in the EIS included this material.

Response

Section 8.1.2.1 of the Repository EIS discusses Greater-Than-Class-C waste. DOE has updated this discussion to include estimated volumes of Greater-Than-Class C wastes that are consistent with the Department's EIS on the subject, which it is preparing. The estimates of environmental impacts from Inventory Module 2 include the disposal of the full inventory of Greater-Than-Class C wastes.

1.12 Impact Mitigation and Compensation

1.12 (162)

Comment - 2 comments summarized

Commitment to Best Management Practices and Mitigation

Two comments stated that DOE has failed to commit to best management practices as part of the Proposed Action. One comment stated that DOE has inappropriately mixed the use of best management practices and mitigation, and that the impact analyses in Chapters 4, 5, 6, and 7 should have disclosed impacts after implementation of the best management practices.

Response

As discussed in Chapter 2 and Chapter 9 of the Repository SEIS, best management practices are an integral part of the Proposed Action. They are integral to the design, construction, and operation of the Yucca Mountain Repository, and the design for the repository incorporates them. Table 9-1 in the SEIS summarizes the best management practices DOE has identified for this Proposed Action. DOE defines best management practices for the SEIS as the processes, techniques, procedures, or considerations it would employ to avoid or reduce the potential environmental impacts of its Proposed Action in a cost-effective manner while meeting the Yucca Mountain Repository project objectives. DOE states in Section 9.2.1 that many of the mitigation measures previously identified in Chapter 9 of the Yucca Mountain FEIS are considered best management practices in the SEIS. The designation of certain "processes, techniques, procedures, or considerations" as best management practices rather than mitigation measures is appropriate.

Because best management practices are integral to the design, construction, and operation of the repository, the DOE impact analysis assumed they would be in place except for certain analyses. For example, the nonradiological air quality impact analysis did not consider dust suppression to be in use when it calculated emissions from construction, operation, or closure activities that could generate fugitive dust. Therefore, the calculated air emissions in Section 4.1.2 and Appendix B of the Repository SEIS were conservative because the application of dust suppression practices would reduce the potential for fugitive dust generation and thereby decrease emission rates.

1.12 (4187)

Comment - 8 comments summarized

Inadequate Mitigation Measures

Several commenters expressed concern that the mitigation measures in the Draft Repository SEIS were inadequate or incomplete. One commenter stated that the mitigation discussions are lacking in commitment and concern, and reflect DOE's lack of an overall approach to meaningful committed mitigation.

Two comments stated that the Repository SEIS must include disclosure of a comprehensive suite of possible measures to mitigate impacts of the Proposed Action and any action alternatives, including impacts from national and Nevada transportation, and that the SEIS must describe the expected contribution of each identified measure to mitigation of impacts. Two comments stated that the SEIS should have discussed reasonable alternatives for mitigation, and provided detail for those to which DOE is prepared to commit and describe in a Mitigation Action Plan. One comment stated that the SEIS should describe the relationship between the Record of Decision to result from the Final Repository SEIS, the Mitigation Action Plan, and how one or both of those documents would be considered during the NRC licensing proceeding for Yucca Mountain.

Two comments indicated that it was impossible to determine mitigation measures for Nevada transportation because Chapter 9 (Section 9.3) of the Repository SEIS refers the reader to Chapter 7 of the Rail Alignment EIS for a discussion of such measures. One comment stated that the Rail Alignment EIS should include a detailed discussion of mitigation measures that DOE proposes along the entire Nevada transportation corridor.

Two comments indicated that, because the Department is revising the Radioactive Material Transportation Practices manual (DOE M 460-2.1), it is inappropriate to rely on mitigation actions in this manual; rather, the SEIS should describe the exact practices DOE is committed to uphold.

Response

DOE is firmly committed to the implementation of sound stewardship practices that protect air, water, land, and cultural and ecological resources. Chapter 9 of the Repository SEIS discusses measures DOE would implement to mitigate adverse impacts to the environment that could occur if the Department implemented the Proposed Action; these include best management practices and management actions. Best management practices are an integral part of the Proposed Action (integral to the design, construction, and operation of the Yucca Mountain Repository) and DOE has incorporated them in the repository design. Specific management actions DOE would take include complying with other government agency stipulations or specific guidance, coordinating with government agencies or interested parties, implementing DOE policy decisions, monitoring relevant ongoing and future activities and, if appropriate, instituting corrections actions. DOE has identified and considered mitigation measures that are relevant and reasonable including measures that may be outside DOE's jurisdiction.

DOE has expanded Section 9.2 of the Repository SEIS to describe further the adaptive management approach that it intends to use to further develop and implement the best management practices and management actions identified in the SEIS. This section also describes the Department's proposal to charter one or more Mitigation Advisory Boards to provide advice on the development of mitigation measures for the construction, operations, monitoring, and closure of the Yucca Mountain Repository and the construction and operation of the railroad.

DOE will not prepare a Record of Decision for the construction, operations, and monitoring, and closure of the proposed repository. However, the Department has committed to preparation of a mitigation action plan as part of the Proposed Action. Section 9.2.2 clarifies the Department's intent to prepare a mitigation action plan and provides a brief description. The plan would be developed in consultation with the proposed Mitigation Advisory Board for Nye County.

DOE has revised Section 9.3.2 to further clarify Nevada transportation-related best management practices and mitigation measures.

As discussed in Section 9.3.1, DOE would implement best management practices to improve the protection of workers and the public during the transportation of spent nuclear fuel and high-level radioactive waste and would continue to follow U.S. Department of Transportation and NRC transportation rules. DOE would also follow or exceed future rules that Congress, the Department of Transportation, or the NRC might establish. Therefore, current or future revisions of the Radioactive Material Transportation Practices manual (DOE M 460-2.1) would be applicable in the context of supplemental information on transportation activities for the Proposed Action, including mitigation measures.

1.12 (975)

Comment - RRR000617 / 0029

Page 9-6, Section 9.2.3—Nye County is not the only unit of local government potentially impacted by the Yucca Mountain repository system (which includes transportation); Lincoln County clearly will be affected by transportation of nuclear waste to Yucca Mountain if the Caliente Corridor is adopted, and may also be affected by radiological releases caused by volcanic eruptions. The community of Rachel, located in Lincoln County, lies only 65 miles (and downwind) of Yucca Mountain—much closer than Las Vegas is to the proposed repository site.

Recommendation: Because direct rail to Yucca Mountain is a connected action to the repository, a similar section providing the perspectives of Lincoln County should be included in the SEIS.

Response

DOE has added Lincoln County as a Cooperating Agency for the Nevada Rail Corridor SEIS and Rail Alignment EIS, and has added a Lincoln County section to each of those documents. Thus, the Department has incorporated the Lincoln County section by reference in the Repository SEIS.

1.12 (976)

Comment - RRR000617 / 0030

Page 9-7, Section 9.3—Lincoln County's comments to the Rail Corridor SEIS (DOE/EIS-0250F-S2D) and Rail Alignment DEIS (DOE/EIS-0369D) are incorporated here by reference.

Response

DOE has updated Section 9.3.2 of the Repository SEIS to reflect changes in Chapter 7 of the Rail Alignment EIS that addressed Lincoln County's comments.

1.12 (2533)

Comment - RRR000681 / 0042

Clark County holds an Endangered Species (Section 7) permit for the desert tortoise. This range-wide permit could be at risk should transportation construction, staging, or operations impact the scope of the permit. Mitigation measures for protecting endangered species are not described in the existing documents.

Response

As described in Section 4.1.4.1.3, the Department has completed consultation with the U.S. Fish and Wildlife Service on construction of the repository and would implement the mitigation measures required by the Biological Opinion that the Service issued in 2001 for the protection of desert tortoises. The Biological Opinion was included in Appendix O of the Yucca Mountain FEIS and was incorporated by reference in the Repository SEIS. The Department has entered consultation for the construction of a rail line from Caliente, Nevada to Yucca Mountain; no part of that railroad would be in Clark County. DOE does not anticipate conducting any activities in Clark County related to the Proposed Action that would require consultation with the Service, that would be covered under the Endangered Species permit held by Clark County, or that would affect the scope of that permit.

1.12 (2656)

Comment - RRR000569 / 0001

If there are any planned activities which will disturb or destroy geodetic control monuments, NGS [National Geodetic Survey] requires notification not less than 90 days in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any required relocation(s).

Response

Implementation of the Proposed Action could affect geodetic control monuments in areas that construction, operations, monitoring, or closure of the repository would disturb. Therefore, DOE has revised sections in Chapters 3, 4, and 9 of the Repository SEIS.

DOE has revised Section 3.1.1.2 of the Repository SEIS to state that geodetic control monuments could be in the analyzed land withdrawal area or areas to the south that DOE has proposed for an access road from U.S. Highway 95 or offsite facilities.

The Department has revised Section 4.1.1.2 of the SEIS to state that, before undertaking ground-disturbing activities for the construction, operations, monitoring, or closure of the repository, it would identify geodetic control monuments in areas it could disturb. DOE would notify the Office of the Director of the National Oceanic and Atmospheric Administration, National Geodetic Survey no less than 90 days before planned activities that could disturb or destroy the monument.

Section 9.2.2 of the SEIS identifies the above mitigation measures as potential management actions and states that, if geodetic control monuments required relocation, DOE would consult with the National Oceanic and Atmospheric Administration to develop a mitigation measure that could include compensation for the cost of monument relocation.

1.12 (3151)

Comment - RRR000121 / 0013

Additional potential adverse impacts and concerns of the WSNC not addressed from a culturally appropriate tribal perspective in the Repository SEIS and the Rail Alignment EIS include:

Additional impact results when culturally appropriate mitigation is not taken or positive benefit made to Western Shoshone victims to offset impacts.

Response

DOE agrees that additional impacts could result if it did not implement appropriate mitigation measures. Chapter 9 of the Repository SEIS discusses measures DOE would implement to mitigate adverse impacts to the environment that could occur if it implemented the Proposed Action. As discussed in Section 9.2.2, DOE would continue the Native American Interaction Program to promote a government-to-government relationship with American Indian tribes and to concentrate on the continued protection of important cultural resources. Section 9.2 discusses the adaptive management approach (consider the magnitude of potential impacts, mitigate, implement, monitor, and adapt) that DOE could use to respond to unanticipated changes in local conditions or subsequently developed information.

1.12.1 Impacts Mitigation

1.12.1 (84)

Comment - 3 comments summarized

Mitigation/Remediation for Alkali Flat/Franklin Lake Play.

DOE received several comments on a cleanup or remediation plan for potential radionuclides surfacing at Alkali Flat/Franklin Lake Playa. Inyo County believes (and the California Energy Commission agrees) that it is DOE's responsibility to implement a mitigation/remediation plan, and an evacuation plan should the repository suffer a catastrophic failure.

Response

The long-term risk to area residents and visitors from groundwater contamination would be very low based on the results of annual dose and groundwater performance analysis discussed in Chapter 5 and Appendix F of the Repository SEIS. Table 5-4 summarizes the estimated radiological impacts to the reasonably maximally exposed individual during the first 10,000 years after repository-closure and for the post-10,000-year period up to 1 million years. The values in Table 5-4 are well within the regulatory limits in the proposed EPA standard for protection of individuals.

During the active, preclosure phases of the project, DOE would be required by NRC regulations (10 CFR 63.161) to develop and be prepared to implement an emergency plan to cope with radiological accidents that may occur at the repository operations area. After sealing the repository, DOE would conduct postclosure monitoring to continue to ensure acceptable performance. DOE studies and models of postclosure performance, as described in Chapter 5 and Appendix F, indicate that impacts under even the most severe scenarios would be represented by low quantities and slow increases of radionuclides in the groundwater pathway. DOE's postclosure monitoring would provide early detection of any unusual conditions in the groundwater. As a consequence, there would be ample time to plan corrective measures to protect the public.

1.12.1 (496)

Comment - RRR000396 / 0027

SEIS Section Best Management Practices

Section 9 of the draft SEIS provides a detailed discussion on the issues that may impact Nye County concerning the proposed Yucca Mountain repository. Yucca Mountain has the potential for radionuclide transport into Inyo County through the major springs in Death Valley National Park via the LCA [lower carbonate aquifer] or at Franklin Lake Playa via the volcanic Tertiary aquifers. The DOE should provide the same level of effort to discuss potential impacts to Inyo County due to the potential of radionuclide contamination of groundwater.

Response

The discussion in Section 9.2.3 of the Repository SEIS, which applies only to Nye County, is that county's perspective, as a cooperating agency and the site of the proposed repository, on mitigation measures. General best management practices and management actions to mitigate impacts, as described in Sections 9.2.1 and 9.2.2 of the SEIS, would include actions potentially applicable to Inyo County as well as Nye County and elsewhere.

1.12.1 (1601)

Comment - RRR000690 / 0023

The SEIS includes statements concerning the reclamation, recovery and abandonment of the YMP [Yucca Mountain Project] site upon the fulfillment of its depository mission. However, the SEIS is absent information and an assessment concerning the indigenous peoples perspective of what is required to "restore" or reclaim an area that has been disturbed by activities of the scale and scope of YMP. Therefore, any SEIS discussion of post YMP operations must include a fully funded systematic study, conducted with impacted indigenous peoples, concerning any and all contemplated post YMP closing environmental restorative actions. Indigenous people should also be employed by the DOE to monitor reclamation activities.

Response

Chapter 9 of the Repository SEIS discusses measures that DOE would implement to mitigate adverse impacts to the environment that could occur if the Department implemented the Proposed Action including those measures related to reclamation. DOE would reclaim lands it no longer needed for repository construction or operations and would monitor those lands to determine if reclamation efforts were successful following guidance in its Reclamation Implementation Plan. As discussed in Section 9.2.2, DOE would continue the Yucca Mountain Project Native American Interaction Program, which has been in existence since 1985, to promote a government-to-government relationship with American Indian tribes and to concentrate on the continued protection of important cultural resources. In addition, as discussed in Section 4.1.13.4, DOE would engage in regular consultations with representatives of tribes in the region to identify measures to protect cultural resources and thereby address some of the concerns the tribes have expressed.

1.12.1 (1696)

Comment - RRR000657 / 0002

[Nye] County's approach to the assessment of cumulative impacts differs from the approach taken in the Draft Repository SEIS, primarily reflecting different regions of influence and a long-term historical

perspective. However, as the County notes in its evaluation, many of the impacts identified could be addressed and mitigated through implementation of various, routine measures. Identification and implementation of such measures could be facilitated through consultation, cooperation and advance planning between the County and DOE.

Because of these differences in perspective and uncertainty about future conditions, the conclusions about potential impacts presented in the Draft Repository SEIS should be continuously evaluated as the Proposed Action is implemented. Nye County believes that an adaptive management approach is needed that includes the development of a comprehensive environmental and socioeconomic baseline followed by continuous monitoring of changes with regard to that baseline. With a baseline and monitoring established, the socioeconomic and fiscal impacts of the Yucca Mountain Project on Nye County can be ascertained and appropriate mitigation measures implemented. As the situs jurisdiction and a cooperating agency, Nye County realizes mutual benefit for both the federal and local government in partnering to monitor, assess, and evaluate conditions at and around the repository site. Through joint monitoring and adaptive management, Nye County can assist DOE in the identification of impacts and their significance, and then cooperatively plan and develop effective mitigation measures. Nye County believes that such mutual consultation and cooperation should be formalized through a memorandum of understanding. Nye County has included suggested text revisions that address these recommendations. We encourage DOE to work with Nye County to develop this Adaptive Management program as early in the process as possible since some of the expected mitigation measures need to be started several years before the project starts. An example of these measures would be road construction and worker training programs. These types of mitigation measures will benefit both DOE and Nye County but should be completed prior to the start of construction to achieve the maximum benefit.

Response

DOE has expanded Section 9.2 of the Repository SEIS to better reflect DOE's position on adaptive management (consider the magnitude of potential impacts, mitigate, implement, monitor, and adapt). This section also describes the Department's proposal to charter one or more Mitigation Advisory Boards to provide advice on the development of mitigation measures for the construction, operations, monitoring, and closure of the Yucca Mountain Repository and the construction and operation of the railroad.

1.12.1 (1780)

Comment - RRR000657 / 0043

Comment: Section 10.1.1.7, pages 10-4 and 10-5: This section discusses impacts from radon and its decay products.

Resolution: Since almost all radiation impacts are from radon, DOE should commit to ensuring that a monitoring program is in place as soon as possible to establish a baseline for radon exposure at various site boundary locations and continue the monitoring throughout construction and operations of the repository. DOE should also give serious consideration to monitoring in conjunction with Nye County, to create a baseline against which other potential offsite hazards could be measured.

Response

Section 9.2.2 of this Repository SEIS discusses DOE's intent to prepare a mitigation action plan which would be developed in consultation with the proposed Mitigation Advisory Board for Nye County. Specifics regarding monitoring of mitigation measures (including the need to establish baselines) would be described in this plan.

1.12.1 (1789)

Comment - RRR000657 / 0039

Comment: Section 9.2.2, page 9-2: This section discusses stewardship practices and implementation of environmental management systems as part of its Integrated Safety Management Systems. It states: This structured approach to adaptive management through monitoring is currently an active part of DOE'S management structure; DOE would continue this practice throughout the Proposed Action. As part of the planning process, DOE would establish measurable environmental objectives, and set measurable goals and targets (for example, pollution prevention goals for reductions in waste generation). DOE would then implement programs, procedures, and controls for monitoring and measuring progress, document progress and, if appropriate, institute corrective actions.

Resolution: Page 9-5 first bullet list, add: Monitor residency trends of Repository workers to assess and evaluate conditions at and around the repository site as repository-related activities take place. Add the following text to the discussion: The Council on Environmental Quality (CEQ) addressed the potential for using adaptive management in the NEPA process in "The National Environmental Policy Act: A Study of its Effectiveness After Twenty-five Years" (CEQ 1997). The study concluded that a "major difficulty with the traditional environmental impact analysis process is that it is a one-time event". Unfortunately, the process does not account for unanticipated changes in environmental or social conditions, inaccurate predictions, or subsequent information that might affect the original mitigation measures. The adaptive management model, by adding "monitor and adapt," was seen as a significant improvement.

Although extensive studies, analyses, and modeling were conducted for the Repository, a level of uncertainty remains regarding potential environmental and social impacts. Therefore, adopting an adaptive management approach, which would include the implementation of an adaptive management plan, would provide DOE with a clear process for monitoring various parameters and adapting management decisions and mitigation measures as needed.

Amend the reference list to include:

CEQ. 1997. "The National Environmental Policy Act: A Study of its Effectiveness After Twenty-five Years." January 1997. Available at http://ceq.eh.doe.gov/nepa/nepa25fn.pdf.

CEQ. 2003. "The NEPA Task Force Report to the Council on Environmental Quality, Modernizing NEPA Implementation," September 2003.

Response

DOE agrees that adaptive management principles should be applied to the repository program and has expanded Section 9.2 of the Repository SEIS to reflect its approach for implementation of adaptive management.

1.12.1 (3128)

Comment - RRR000524 / 0031

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

Response

DOE has revised Table 9-1 to include the best management practices identified in Chapters 4, 5, and 6

1.12.1 (3663)

Comment - RRR000642 / 0013

No mitigation is being identified in these EIS documents for potential national transportation impacts outside of the State of Nevada. The DSEIS states that, "Shipments of spent nuclear fuel and high-level radioactive waste would represent a very small fraction of total national highway and railroad annual traffic (less than 0.1 percent." (DSEIS Summary, page S-42). From the perspective of all highways and railroads in all affected states, the impact in terms of the number of repository shipments relative to other shipments would be small. However, to adequately determine transportation impacts to a particular state, city, or county, route-specific analyses must be provided, impacts evaluated, and mitigation measures described for major potential impacts.

Response

DOE based its identification of rail lines on current rail practices because there are no comparable federal regulations applicable to the selection of rail lines for the shipment of radioactive materials. It would be premature to identify specific mitigation measures beyond compliance with U.S. Department of Transportation and NRC regulations. Appendix H of the SEIS contains supplemental information about transportation activities for the Proposed Action, including regulations, operational practices, cask safety and testing programs, emergency response, security, and liability.

1.12.1 (4088)

Comment - RRR000671 / 0072

Page 4-126 Table 4-39 Best Practices and Mitigation Measures—The text does not identify nor mention the *Native American Graves Protection Act* or NRS [Nevada Revised Statute] 363.160 Protection of Indian Burials on Private and State Lands. The text should be expanded to include these regulations and any others that have been inadvertently omitted.

Response

Table 4-39 of the Repository SEIS summarizes best management practices and mitigation measures that were identified for the infrastructure improvements. The purpose of this table is not to summarize potentially relevant regulations. Chapter 11 of the SEIS contains a complete discussion of regulations and related requirements. This chapter identifies major requirements that could be applicable to the Proposed Action. Section 11.2 summarizes statutes and regulations that set environmental protection requirements that could apply to the construction and operations of the repository and to transportation of radioactive materials, including the *Native American Graves Protection and Repatriation Act of 1990*. Section 11.5 contains a list of other federal regulations and DOE Orders that are potentially applicable to the construction, operations, monitoring, and closure of a geologic repository.

Section 11.2 does not include a discussion of Nevada Revised Statute 383 which applies to (1) the creation and duties of the State Historic Preservation Office, (2) American Indian burials on state and private lands, and (3) State Historic Preservation Office relationships with other state agencies. This statute does not apply to federal lands or federal projects that do not involve private or state lands. The Yucca Mountain Repository site is federal and not subject to Nevada Revised Statute 383. If, during the Yucca Mountain Project, DOE encountered American Indian burial sites on state or private lands as a

result of repository-related actions, it would comply with Nevada Revised Statute 383.150 - 383.190, "Protection of Indian Burial Sites."

1.12.1 (4105)

Comment - RRR000176 / 0004

Impacts of this project, both positive and negative, should be documented early in the environmental review process so that the design process can mitigate the few real adverse impacts early and produce the safest, most efficient project

Response

In the Repository SEIS, DOE has identified all impacts positive and negative that would result from the construction, operations, monitoring, and closure of the proposed repository. DOE is committed to the implementation of sound stewardship practices that would protect environmental resources that repository activities could affect. The Department would accomplish its commitment through implementation of the Environmental Management System that would be part of its Integrated Safety Management System. The structure of these systems would support mitigation of identified impacts.

As discussed in Section 9.2 of the Repository SEIS, DOE could use an adaptive management approach (consider the magnitude of potential impacts, mitigate, implement, monitor, and adapt) to respond to unanticipated changes in local conditions or subsequently developed information, for example, and thus make cost-effective adjustments to its best management practices and management actions, as necessary.

1.12.1 (4210)

Comment - RRR000522 / 0018

With regard to specific measures to mitigate impacts resulting from development and operation of the Yucca Mountain repository system, including truck transportation, in White Pine County, the Repository DSEIS contains none. White Pine County has completed a preliminary analysis of the impacts of the Yucca Mountain repository system on the County, including identification of alternative measures to mitigate impacts (White Pine County, 2001). DOE is strongly encouraged to review this report and to incorporate various descriptions of repository system impacts to White Pine County in the Repository FSEIS. ... Chapter 9 of the Repository DSEIS should be expanded to include a full range of measures to mitigate impacts of the repository system ...

Response

DOE has reviewed the subject report. For the transportation of radioactive materials by truck, the U.S. Department of Transportation regulations require the use of preferred routes (Interstate System highway, beltway or bypass, and state and tribal designated alternate) that reduce time in transit. Based on this criterion, shipments of spent nuclear fuel and high-level radioactive waste would not be transported through White Pine County. However, if in the future the State of Nevada designates a route through White Pine County as being an alternate preferred highway route, then DOE would consider this route and at that point would consult with the County regarding potential mitigation measures.

1.12.1 (4217)

Comment - RRR000663 / 0060

When discussing the need for training for emergency responders to respond to incidents involving these shipments, DOE states that Section 180(c) of the NWPA allows DOE to provide funding for this training.

The EIS, however, states that "DOE could provide such training" (Page 9-7, Repository DSEIS, emphasis added). DOE should state that the NWPA requires DOE to provide such funding, and that DOE will provide the training. However, the EIS should address the likely and reasonably foreseeable possibility that Congress will not appropriate sufficient funds to provide adequate training for all responders.

Response

In relation to training for emergency responders, DOE has revised Section 9.3.1 of the Repository SEIS to state that the NWPA "requires" DOE to provide technical assistance and funds to states and tribes for training and that the Department "would" provide such training.

In relation to the likelihood of sufficient funding for responder training, DOE annually requests appropriations to fulfill its responsibilities. Congress annually determines funding for DOE, based on appropriate requests from the President.

1.12.2 Impacts Compensation

1.12.2 (160)

Comment - 10 comments summarized

Compensate the Citizens of Nevada

DOE received a number of comments that stated the citizens of Nevada should receive compensation for hosting the repository. Suggestions for compensation included the funding of schools, educational programs, highway projects, construction projects (such as training facilities or fire stations), water projects, or law enforcement (to hire additional personnel); reduction or elimination of income taxes; comprehensive health care that covers all health issues (preventive, existing health issues, emergency, long-term care, etc.); and importing of water from other states to develop a sustainable water supply in Southern Nevada.

Response

DOE has limited authority to consider some forms of compensation. DOE does not have authority to provide compensation such as that mentioned in the comment. Section 116(c)(2) of the *Nuclear Waste Policy Act* (NWPA) requires the Secretary of Energy to provide financial assistance to the State of Nevada and any Affected Unit of Local Government that requests such assistance to mitigate the impacts of the development of a repository and characterization of the site. The State and any Affected Unit of Local Government can request such assistance.

In addition, the Secretary has the authority to grant the State and any Affected Unit of Local Government an amount each fiscal year equal to the amount they would receive if they could tax the site characterization, development, and operation of a repository as they would tax non-federal real property and industrial activities. Payments-Equal-To-Taxes are pursuant to Section 116(c)(3)(A) of the NWPA, which requires the Secretary of Energy to grant to the State of Nevada and any affected unit of government an amount each fiscal year equal to the amount such State or affected unit of local government, respectively, would receive if authorized to tax site characterization activities at such site, and the development and operation of such repository. DOE determines these payments, historically and for the future, by estimating the amount of Yucca Mountain Project property, purchases (in and out of the State), and business activities (employees) in the jurisdiction of an affected unit of government.

As discussed in Section 3.1.7.3 of the Repository SEIS, DOE acquired data from the Yucca Mountain Project organizations that purchase or acquire property for use in Nevada, have employees in Nevada, or use property in Nevada. These organizations include federal agencies, national laboratories, and private firms. Not all of these have a federal exemption, so they pay appropriate taxes. The purchases (sales and use tax), employees (business tax), and property (property or possessory use taxes) of the Project organizations that exercise a federal exemption are subject to the Payments-Equal-To-Taxes provision. At present, DOE makes Payments-Equal-to-Taxes to the State, Nye County, and Clark County. As shown in Table 3-12 of the SEIS, DOE paid more than $11 million a year in Payments-Equal-to-Taxes for the Yucca Mountain Project for 2004 through 2007 (a total of $46 million).

Section 171 of the NWPA authorizes payments to the State of Nevada of $10 million per year prior to the first shipment of waste, $20 million on first spent nuclear fuel receipt, and $20 million per year thereafter until closure. However, receipt of this payment waives the right of the State to disapprove the siting of the repository under Title 1 of the Act, and the State of Nevada has not agreed to accept these payments.

1.12.2 (608)

Comment - RRR000124 / 0003

The commenter stated “that several people were given insufficient protective breathing gear while working at Yucca Mountain. They became very ill and had to be hospitalized. It is my understanding that several of them died because of inadequate breathing equipment. I wonder if your Agency made any compensation to the families of the deceased?”

Response

No work-related deaths have occurred in association with work conducted at the Yucca Mountain site. During the development of the Exploratory Studies Facility, DOE and its contractors followed appropriate health and safety requirements, including the use of protective equipment. Section 3.1.8.3 of the Repository SEIS discusses health-related mineral issues that were identified during site characterization at Yucca Mountain. The health risks for both cristobalite (a form of crystalline silica) and erionite were identified and discussed. The 2004 Silicosis Medical Screening Program for Yucca Mountain tunnel workers who were involved in tunneling and underground operations between 1992 and 2004 was described. In that program, 6,228 informative letters, postcards, and invitations to participate in the screening program were sent to affected individuals; 978 persons responded to the mailings; 551 persons completed a work history interview; and 414 of those interviewed underwent a medical examination. Two cases of silicosis were diagnosed during the screening examination, although one case previously had been diagnosed and reported as medical history. Neither case of silicosis could be attributed solely to exposure at Yucca Mountain because both workers had a long history of working in occupations that were dusty and likely to contain silica dust.

1.12.2 (1578)

Comment - RRR000690 / 0039

Potential impacts to services such as law enforcement and the lack of emergency training or preparedness/response equipment.

Response

DOE will comply with Section 180(c) of the *Nuclear Waste Policy Act* which requires DOE to provide technical assistance and funds to states and tribes for training public safety officials of appropriate units of

local governments through whose jurisdictions the Department would transport spent nuclear fuel or high-level radioactive waste. Section 180(c) mandates that training cover procedures for safe routing and emergency response situations. Section 180(c) encompasses all modes of transportation; funding would come from the Nuclear Waste Fund. Once implemented, this program would provide funding and technical assistance to train firefighters, law enforcement officers, and other public safety officials in preparation for repository shipments through their jurisdictions.

If an emergency that involved a DOE radioactive materials shipment occurred, incident command would be established based on the procedures and policies of the state, tribe, or local jurisdiction. When requested by civil authorities, DOE would provide technical advice and assistance, including access to teams of experts in radiological monitoring and related technical areas.

1.13 DOE Credibility

1.13 (28)

Comment - 10 comments summarized

DOE Credibility

Several commenters expressed doubt in DOE's credibility and a general mistrust of the government. The commenters referred to past DOE actions such as operation of the Nevada Test Site and human health issues, and asserted that DOE has an agenda. A commenter questioned DOE's ability to provide adequate project management that would ensure long-term health and safety.

Response

DOE has both the statutory responsibility and the technical expertise and capability to design, construct, operate, monitor, and close a repository at Yucca Mountain, and to establish an appropriate transportation program for moving spent nuclear fuel and high-level radioactive waste to the site. DOE continually works to improve its safety and environment performance and could not receive or maintain a license for the repository without complying with all applicable NRC safety and health requirements.

1.14 Comments Out of Scope of EIS and the Yucca Mountain Site Characterization Project

1.14 (4190)

Comment - 3 comments summarized

Out of Scope

Commenters provided comments which were outside of the scope of the Repository SEIS including concern over activities at Nellis Air Force Bases' secret test sites, restructuring the nuclear fuel cycle with the government, reprocessing of spent nuclear fuel, transmutation of Uranium, development of renewable energy, water development for the southwestern United States, and flood abatement along the Mississippi and Missouri Rivers.

Response

These comments are outside the scope of this Repository SEIS.

1.14 (539)

Comment - RRR000388 / 0001

The commenter suggests that much of the public discussion related to Yucca Mountain is a case of hysteria and not rationalism.

Response

Thank you for your comment.

1.15 Presentation

1.15 (4161)

Comment - 19 comments summarized

Out of Scope

Commenters provided specific comments on the way information DOE presented in the Summary and sections of the Draft Repository SEIS. They commented on wording used, wording suggestions, typographical errors, presentation formats, and apparent inconsistencies found in the summary and other sections of the document including specific wording suggestions, the use of tabular format instead of graphs, references to missing or incorrect sections, the use of English and metric values and conversions, consistent application of terminology, and references to the Yucca Mountain FEIS.

Response

DOE considered these comments in revising the Draft Repository SEIS.

1.16 General Participation

1.16 (170)

Comment - 13 comments summarized

General Participation in the NEPA Process

A number of people participated in the public-comment process but did not provide specific comments on the Draft Repository SEIS.

Response

One of the key components of the *National Environmental Policy Act* process is involvement of people and organizations that have an interest in or could be affected by the proposed project (representatives from federal, state, tribal, or local agencies; members of Congress or state legislatures; unions, educational groups, environmental groups, industrial groups, etc.; and members of the general public); DOE appreciates your participation.

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CONVERSION FACTORS

Metric to English			English to Metric		
Multiply	by	To get	Multiply	by	To get
Area					
Square kilometers	247.1	Acres	Acres	0.0040469	Square kilometers
Square kilometers	0.3861	Square miles	Square miles	2.59	Square kilometers
Square meters	10.764	Square feet	Square feet	0.092903	Square meters
Concentration					
Kilograms/sq. meter	0.16667	Tons/acre	Tons/acre	0.5999	Kilograms/sq. meter
Milligrams/liter	1[a]	Parts/million	Parts/million	1[a]	Milligrams/liter
Micrograms/liter	1[a]	Parts/billion	Parts/billion	1[a]	Micrograms/liter
Micrograms/cu. meter	1[a]	Parts/trillion	Parts/trillion	1[a]	Micrograms/cu. meter
Density					
Grams/cu. centimeter	62.428	Pounds/cu. ft.	Pounds/cu. ft.	0.016018	Grams/cu. centimeter
Grams/cu. meter	0.0000624	Pounds/cu. ft.	Pounds/cu. ft.	16,025.6	Grams/cu. meter
Length					
Centimeters	0.3937	Inches	Inches	2.54	Centimeters
Meters	3.2808	Feet	Feet	0.3048	Meters
Micrometers	0.00003937	Inches	Inches	25,400	Micrometers
Millimeters	0.03937	Inches	Inches	25.40	Millimeters
Kilometers	0.62137	Miles	Miles	1.6093	Kilometers
Temperature					
Absolute					
Degrees C + 17.78	1.8	Degrees F	Degrees F – 32	0.55556	Degrees C
Relative					
Degrees C	1.8	Degrees F	Degrees F	0.55556	Degrees C
Velocity/Rate					
Cu. meters/second	2,118.9	Cu. feet/minute	Cu. feet/minute	0.00047195	Cu. meters/second
Meters/second	2.237	Miles/hours	Miles/hour	0.44704	Meters/second
Volume					
Cubic meters	264.17	Gallons	Gallons	0.0037854	Cubic meters
Cubic meters	35.314	Cubic feet	Cubic feet	0.028317	Cubic meters
Cubic meters	1.3079	Cubic yards	Cubic yards	0.76456	Cubic meters
Cubic meters	0.0008107	Acre-feet	Acre-feet	1,233.49	Cubic meters
Liters	0.26418	Gallons	Gallons	3.78533	Liters
Liters	0.035316	Cubic feet	Cubic feet	28.316	Liters
Liters	0.001308	Cubic yards	Cubic yards	764.54	Liters
Weight/Mass					
Grams	0.035274	Ounces	Ounces	28.35	Grams
Kilograms	2.2046	Pounds	Pounds	0.45359	Kilograms
Kilograms	0.0011023	Tons (short)	Tons (short)	907.18	Kilograms
Metric tons	1.1023	Tons (short)	Tons (short)	0.90718	Metric tons
English to English					
Acre-feet	325,850.7	Gallons	Gallons	0.000003046	Acre-feet
Acres	43,560	Square feet	Square feet	0.000022957	Acres
Square miles	640	Acres	Acres	0.0015625	Square miles

a. This conversion factor is only valid for concentrations of contaminants (or other materials) in water.

METRIC PREFIXES

Prefix	Symbol	Multiplication factor		
exa-	E	1,000,000,000,000,000,000	=	10^{18}
peta-	P	1,000,000,000,000,000	=	10^{15}
tera-	T	1,000,000,000,000	=	10^{12}
giga-	G	1,000,000,000	=	10^{9}
mega-	M	1,000,000	=	10^{6}
kilo-	K	1,000	=	10^{3}
deca-	D	10	=	10^{1}
deci-	D	0.1	=	10^{-1}
centi-	C	0.01	=	10^{-2}
milli-	M	0.0 001	=	10^{-3}
micro-	μ	0.000 001	=	10^{-6}
nano-	N	0.000 000 001	=	10^{-9}
pico-	P	0.000 000 000 001	=	10^{-12}