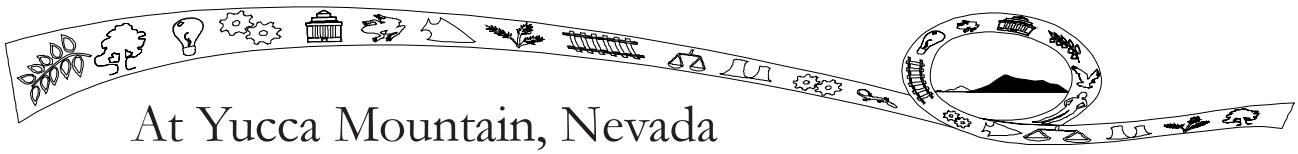
Environmental Impact Statement For A Proposed Repository



At Yucca Mountain, Nevada

Summary of Public Scoping Comments

Related to the

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

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U.S. Department of Energy
Yucca Mountain Site Characterization Office

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Appendix A SUMMARY OF SCOPING COMMENTS BY CATEGORY

ACRONYMS

CFR - Code of Federal Regulations

DOE - Department of Energy

EIS - Environmental Impact Statement

FR - Federal Register

HLW - high-level radioactive waste

MTHM - metric tons of heavy metal

NEPA - National Environmental Policy Act

NTS - Nevada Test Site

NWPA - Nuclear Waste Policy Act

SNF - spent nuclear fuel

1. INTRODUCTION

1.1 PURPOSE AND ORGANIZATION OF THE DOCUMENT

The U. S. Department of Energy (DOE) is evaluating in the *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* [Repository Environmental Impact Statement (EIS)] the proposal to construct, operate, and permanently close a geologic repository [*Federal Register* (FR) 1995a]. This comment summary document summarizes comments and issues identified during the public scoping process and indicates the general approach for addressing issues in the Repository EIS.

Section 1 describes the history and scope of the Repository EIS, the alternatives being evaluated in the EIS, and related National Environmental Policy Act (NEPA) reviews. Section 2 summarizes the major issues identified during the public scoping process for the Repository EIS and describes a general approach for what will be addressed in the EIS. Appendix A contains comment summaries compiled by DOE based on the public comments received during the public scoping process for the Repository EIS.

On July 9, 1996, DOE published a final rule in the *Federal Register* that, among other things, eliminated the requirement to prepare an implementation plan [formerly in Section 1021.312 of DOE NEPA regulations at 10 Code of Federal Regulations (CFR) Part 1021]. This change was made to simplify the DOE NEPA process, reduce cost, and save time. The elimination of the implementation plan does not, however, relinquish the requirement to consider public scoping comments and factor them into the preparation of an EIS. This document summarizes and categorizes comments received during the public scoping process into issue areas to discuss what issues will be addressed in the EIS. The intent is not to provide a direct response to every question that was asked during the public scoping period. Preparation of this document fulfills DOE's commitment, made during the EIS scoping process, to inform the public of the outcome of that process.

1.2 BACKGROUND

The Nuclear Waste Policy Act of 1982, as amended, (NWPA) directs the DOE to evaluate the suitability of the Yucca Mountain site in southern Nevada as a potential site for development of a geologic repository for the disposal of spent nuclear fuel (SNF) and high-level radioactive waste (HLW). If the Secretary of Energy determines that the Yucca Mountain site is suitable, the Secretary may then recommend that the President approve the site for development of a repository. Under the NWPA, such a recommendation must be accompanied by a Final EIS. Therefore, DOE is preparing the Repository EIS to support a potential recommendation for development of a repository at Yucca Mountain. The NWPA also directs the Nuclear Regulatory Commission to adopt DOE's Repository EIS, to the extent practicable, in connection with any

subsequent construction authorization and license that the Commission issues to DOE for the repository.

As discussed in the Notice of Intent, the proposed action is to construct, operate, and eventually close a repository at Yucca Mountain for the geologic disposal of 63,000 metric tons of heavy metal (MTHM) of commercial SNF and 7,000 MTHM of DOE SNF (includes SNF from the Navy Nuclear Propulsion Program) and HLW (FR 1995a). The NWPA states that the EIS does not have to discuss the need for a repository, alternatives to geologic disposal, or alternative sites to Yucca Mountain. DOE identified three alternatives to implement the proposed action based on thermal load objectives; namely, a high thermal load, an intermediate thermal load, and a low thermal load. For each implementing alternative, packaging and transportation options will also be considered.

During the scoping period, DOE received many comments noting the existence of SNF and HLW in excess of 70,000 MTHM, and encouraging DOE to evaluate the total projected inventory of SNF and HLW. In addition, some commentors requested that the EIS evaluate the disposal of other highly radioactive waste types that may require permanent isolation, consistent with related DOE NEPA reviews and other DOE planning documents. Other commentors noted that DOE has a responsibility to start accepting waste shipments prior to the projected 2010 start of repository operations.

Based on the comments received, DOE is considering presenting incremental analyses for the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may require permanent isolation, and/or incremental analyses for receipt of waste at Yucca Mountain prior to full operation of the repository. It should be noted that any DOE decisions based in part on analyses presented in the Repository EIS must be consistent with the provisions of the NWPA and other applicable law. In addition under the NWPA, the Nuclear Regulatory Commission decision approving the first repository license application shall prohibit the emplacement in the first repository of more than 70,000 MTHM of SNF and HLW, until such time as a second repository is in operation.

Figure 1-1 provides a timeline representation of the current schedule for preparation of the Repository EIS.

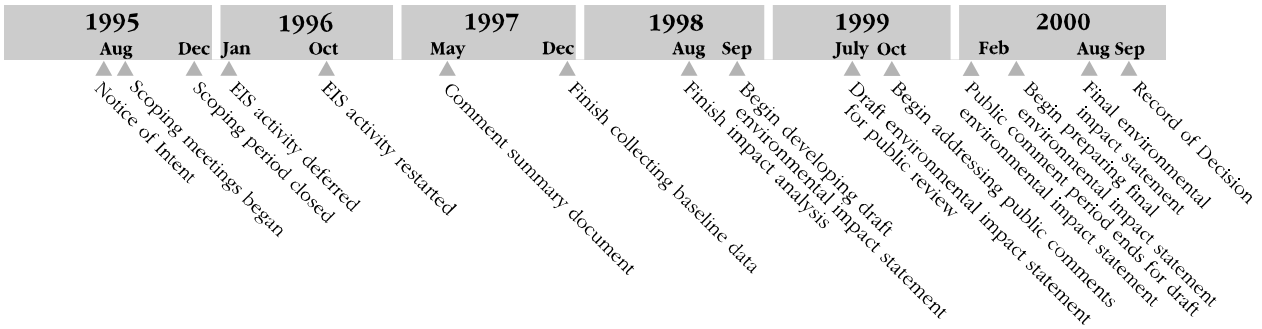

Figure 1-1. Repository EIS Timeline

1.3 ALTERNATIVES TO BE EVALUATED IN THE REPOSITORY ENVIRONMENTAL IMPACT STATEMENT

The proposed action is to construct, operate, and eventually close a repository at Yucca Mountain for the geologic disposal of 63,000 MTHM of commercial SNF and 7,000 MTHM of DOE SNF and HLW. Four alternatives will be evaluated: three alternatives to implement the proposed action and the No Action alternative. The implementing alternatives will be based on thermal load objectives: a high thermal load that considers the emplacement of more than 80 MTHM per acre, an intermediate thermal load of between 40 and 80 MTHM per acre, and a low thermal load of less than 40 MTHM per acre. Each of the thermal loads would produce different underground configurations for the subsurface repository. The configuration would change in size and layout to accommodate emplacement of the waste (i.e., lower thermal loads would require larger underground areas because the waste would be more widely spaced.)

As part of each implementing alternative, two packaging options will be evaluated. Under Option 1, SNF assemblies would be packaged and sealed in multi-purpose canisters at the generator sites prior to being transported in casks to the repository. HLW would be packaged and sealed in canisters prior to shipment in similar casks. Under Option 2, SNF assemblies (without canisters) and sealed canisters of HLW would be transported in casks to the repository.

For each implementing alternative, five transportation options will also be evaluated: two national and three regional (i.e., within the state of Nevada). The first national option would be to ship nuclear fuel and HLW by truck, from the generator site to the repository. The second national option would be to ship by rail, except from those generator sites that do not have access to an existing rail line. For the three regional transportation options, two apply to shipments that would arrive in Nevada by rail, and the third applies to shipments that would arrive in Nevada by truck. The first regional transportation option would be to ship by rail to the repository. The second regional transportation option would be to ship by rail to an intermodal transfer facility for transfer to heavy haul trucks, which would then transport the shipments to the repository. The third regional transportation option would be to use legal weight trucks to ship from the generator sites directly to the repository.

As noted above, based on comments received, DOE is considering evaluating expanded inventory “modules” in the EIS to analyze the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may require permanent isolation. DOE is also considering evaluating receipt of waste at Yucca Mountain prior to full operation of the repository.

Under the No Action alternative, a geologic repository at the Yucca Mountain site would not be constructed. SNF and HLW would continue to accumulate at the 75 commercial nuclear reactor sites and at DOE facilities. The existing tunnel excavation equipment and facilities at the Yucca Mountain site (for example, the Exploratory Studies Facility and support facilities) could be reclaimed, dismantled and removed for reuse, recycling, or disposal as appropriate .

The No Action alternative will be analyzed by evaluating a generic commercial nuclear reactor site and continued storage of waste at DOE facilities. The commercial site and DOE facilities would continue to operate for 100 years to ensure public health and safety. After 100 years, it is assumed that institutional control would be lost. Storage containers at commercial sites would be routinely monitored for corrosion and repackaged as necessary to comply with safety requirements. The DOE-owned SNF and HLW would continue to be stored at the Hanford Site, the Idaho National Engineering and Environmental Laboratory, and the Savannah River Site. It is assumed storage facilities at DOE sites would be upgraded or built as necessary.

The impacts to the environment at commercial nuclear sites will be assessed generically using existing environmental documentation prepared for license applications for these commercial facilities. The impacts will be assessed for two periods of time. The first time frame would be equivalent to the preclosure phase (disposal and caretaker) at the Yucca Mountain site (up to 100 years) and for purposes of analysis it will be assumed that institutional controls, such as monitoring and maintenance, would be maintained. The second time frame would, for purposes of analysis only, consider a long-term loss of institutional control, and would parallel the 100 year analysis period for the action alternatives.

1.4 RELATED NEPA REVIEWS

The DOE and other federal agencies (i.e., the Department of Defense) have completed, are in the process of preparing, or anticipate preparing NEPA documents that could affect the scope of this EIS. The actions under evaluation in these NEPA documents relate primarily to ongoing and proposed defense waste management, environmental restoration, non-defense research and development, and work for other DOE programs as well as non-DOE actions proposed by other federal agencies. These EISs are briefly described below.

The *Environmental Assessment, Yucca Mountain Site, Nevada Research and Development Area, Nevada*, DOE/RW-0073, evaluated the Yucca Mountain in accordance with the DOE's General Guidelines for the Recommendations of Sites for the Nuclear Waste Repositories and found Yucca Mountain suitable for site characterization (DOE 1986).

The Yucca Mountain site lies partly on and partly adjacent to the Nevada Test Site (NTS). As such, proposed actions at the NTS could affect the scope of the Repository EIS. The *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada*, DOE/EIS-0243, identifies a preferred alternative where the NTS would be made available for increased use by DOE to support national defense and nondefense programs (DOE 1996a). The preferred alternative reflects the need to maintain readiness to conduct nuclear-weapons tests, to manage a variety of radioactive wastes, and to restore parts of the NTS that have been contaminated by past DOE activities. Under the preferred alternative, the use of the NTS for other defense purposes would expand, and technological innovation in both the public and private sectors (e.g., to develop economical solar power) would also be encouraged. The Repository EIS will factor plans for increased usage at the NTS into the analysis of cumulative

effects. For example, the combined effects of transporting various radioactive materials to both the repository and to the NTS will be considered in the analyses of cumulative impacts in the Repository EIS.

The *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Environmental Impact Statement*, DOE/EIS-203-F, analyzed the potential environmental consequences of managing DOE's inventory of SNF over the next 40 years (DOE 1995a). The Record of Decision states that SNF will be managed by fuel type at three DOE sites: the Hanford Site, the Idaho National Engineering Laboratory and the Savannah River Site. The Repository EIS will evaluate both the transportation to and the emplacement of this SNF in the geologic repository at Yucca Mountain.

The Record of Decision for the *Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel*, DOE/EIS-0218F, states that aluminum-based and TRIGA (Training, Research, Isotope, General Atomics) foreign research reactor SNF and target material containing uranium enriched in the United States will be accepted into this country to support the United States' nuclear weapons nonproliferation policy (FR 1996a). The aluminum-based SNF and the target material will be processed at the Savannah River Site for ultimate geologic disposal. The TRIGA SNF will be stored at the Idaho National Engineering Laboratory prior to ultimate geologic disposal. The potential shipment of this foreign research reactor SNF from both the Savannah River Site and the Idaho National Engineering Laboratory to the Yucca Mountain site for ultimate disposal will be evaluated in the Repository EIS.

The *Department of the Navy Final Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel*, evaluates alternatives that would provide a system of containers for managing Naval SNF following examination at the Idaho National Engineering Laboratory, prior to potential shipment to Yucca Mountain (U.S. Navy 1996). The Navy has estimated between 300 to 500 container shipments to the proposed repository would occur between the years 2010 and 2035 depending on the alternative selected. The addition of special case waste would increase the number of containers under any alternative by about 15 to 20 percent. The potential shipment of this SNF to Yucca Mountain will be included in the analysis of transportation impacts in the Repository EIS.

The *Draft Waste Management Programmatic EIS*, DOE/EIS-0200-D, is a nationwide study that analyzed the environmental impacts of managing five types of radioactive and hazardous waste, including HLW, from nuclear weapons production and related activities (DOE 1995b). The NTS was identified as a potential site for the disposal of low-level waste and low-level mixed waste; and for the treatment and storage of transuranic waste. The Waste Management Programmatic EIS also evaluated the storage of HLW prior to its potential shipment to Yucca Mountain. If the NTS were chosen as a disposal site for low-level waste and low-level mixed waste and for the storage of transuranic waste, the transportation of these wastes to the NTS will be considered in the analysis of cumulative impacts in the Repository EIS. The

shipment of HLW from DOE storage sites for disposal at Yucca Mountain will also be evaluated in the Repository EIS.

The *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement*, DOE/EIS-0189, August 1996, was jointly prepared by DOE and the Washington State Department of Ecology (DOE 1996b). This EIS evaluated alternatives to manage and dispose of Hanford Site tank waste and encapsulated cesium and strontium. For purposes of analysis, the Tank Waste EIS assumed that up to 7,100 HLW canisters (1,800 Hanford multi-purpose canisters) of material would satisfy the potential repository's acceptance criteria and could be placed in a geologic repository at Yucca Mountain. Any decisions on management of cesium and strontium capsules have been deferred.

The *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement*, DOE/EIS-0229, analyzed the potential consequences of alternatives for the long-term storage (up to 50 years) and disposition of weapons-usable fissile materials from U. S. weapon dismantlements under the responsibility of DOE (DOE 1996c). This EIS evaluated technologies for long-term storage at six DOE candidate sites including the NTS, as well as three alternatives for reactor immobilization that would produce waste forms suitable for disposal at Yucca Mountain. The Record of Decision determined that a combination of immobilization, using vitrification or ceramic techniques, and conversion to a mixed oxide fuel for use in existing light water reactors would be appropriate (FR 1997).

The Yucca Mountain site lies partly on the Nellis Air Force Range Complex. The U.S. Air Force is preparing the *Air Force Range Legislative Environmental Impact Statement* to assess the potential environmental impacts of renewal of the Nellis Air Force Range, which includes more than 3 million acres of land in Clark, Nye, and Lincoln counties in Nevada, all in the vicinity of Yucca Mountain (FR 1996b). The current withdrawal for the range expires on November 6, 2001. Alternatives to be evaluated in the legislative EIS include renewal of the land withdrawal indefinitely, with Congressional review every 15 years; renewal of the land withdrawal for 25 years; and the No Action alternative, which would result in no renewal of the land withdrawal. The proposed actions at the Nellis Air Force Range Complex will be considered in the Repository EIS in the analysis of cumulative impacts to the environment.

The Department of the Navy is preparing an *Environmental Impact Statement for the Proposed Master Land Withdrawal Naval Air Station Fallon, Nevada*, for the withdrawal of federally-owned lands around Naval Air Station Fallon training ranges in Churchill County, Nevada (FR 1995b). The proposed actions at Naval Air Station Fallon will be considered in the analysis of cumulative impacts to the environment in the Repository EIS.

2. THE SCOPING PROCESS

2.1 DESCRIPTION OF THE SCOPING PROCESS

On August 7, 1995, DOE published a Notice of Intent in the *Federal Register* announcing its intent to prepare an EIS for a repository at Yucca Mountain, Nevada (FR 1995a). DOE notified interested persons, including federal, state, and local government agencies, Native American tribal organizations, public interest groups, transportation interests, industry and utility organizations, regulators, and members of the general public, to participate in the scoping process. In addition, DOE held 15 public scoping meetings across the country between August 29 and October 24, 1995, to allow interested parties to present verbal and written comments. The scoping period officially closed December 5, 1995.

To encourage broad participation by the public, DOE notified stakeholders by mail prior to publication of the Notice of Intent and notified the media. Congressional representatives with jurisdiction over nuclear waste issues, Nevada's Congressional delegation, the Office of the Governor of Nevada, the affected units of local government, and affected Indian tribes were notified in advance of publication of the Notice of Intent. A series of information releases were mailed to stakeholders and members of the general public notifying them of the opportunity to comment. Press releases and public service announcements were submitted to selected newspapers, television stations, and radio stations. DOE representatives met with local television, radio, and newspaper reporters at each scoping location prior to each scoping meeting to provide information about the repository program, the EIS, and the scoping process. Information about the repository program was inserted into utility bills, and informational flyers and fact sheets were distributed widely at each scoping location and by request.

Specific techniques were employed to meet environmental justice goals for the Repository EIS. These included assessing each of the 15 cities where public scoping meetings were held to determine if any one ethnic group comprised at least 10 percent of the total population. If this was the case, then news publications and/or radio stations that specifically targeted these populations were contacted to notify them of the scoping meetings. Translators were offered upon request.

2.1.1 Pre-Scoping Briefings

Oversight and stakeholder groups were briefed prior to publication of the Notice of Intent. These groups included the Nuclear Regulatory Commission, the Nuclear Waste Technical Review Board, Native American tribal organizations, and the ten affected units of local government. The proposed action and alternatives, the proposed schedule of scoping meetings, and the means by which DOE intended to solicit public comment were discussed.

2.1.2 Public Meetings

Publication of the Notice of Intent on August 7, 1995, marked the beginning of the formal public scoping period for the EIS. Of the 15 public scoping meetings, five were conducted in Nevada. One scoping meeting with two sessions was held at each location: either a morning or afternoon session and an evening session to provide wide opportunities for public involvement.

At the beginning of each session a facilitator explained the scoping meeting format. This was followed by DOE describing the repository program, the EIS, and the scoping process. The public was encouraged to ask questions and discuss particularly important aspects of the repository program with DOE and technical staff. At the end of the question and answer period, the formal public comment portion of the scoping meeting began and the facilitator invited members of the public to comment on the scope of the EIS. Court reporters typed verbatim transcripts of the proceedings. Blank comment cards were available for those members of the public who preferred to provide written comments. A separate information room, containing exhibits and handouts about the repository program and the EIS, was set up at each public scoping meeting. Technical representatives were present to answer questions. In addition to the formal meetings, scoping comments could also be submitted to the DOE through toll-free phone calls, faxes, and conventional and electronic mail. Moreover, information about the repository program, the EIS, and the scoping process was available to the public on the Internet and in designated public reading rooms around the country.

In addition to the 15 public scoping meetings, DOE representatives also met with 13 Native American tribes to describe the EIS scoping process and encourage tribal involvement in the process. Seven hundred eighty-five (785) people attended the 15 scoping meetings, of which 242 participants provided verbal comments. Five hundred sixty-eight (568) people submitted comments during the public comment period. Table 2-1 lists the meeting locations, dates, attendance and number of commentors. Table 2-2 lists the 21 categories of issues identified during scoping and the number of people who commented.

2.2 RESULTS OF THE SCOPING PROCESS

The EIS will evaluate the site-specific environmental impacts from construction, operation, and closure of a repository for SNF and HLW disposal at Yucca Mountain, Nevada. Other wastes that require permanent isolation and are compatible for storage in a repository environment are being considered for possible evaluation in the EIS based on public scoping comments. The transportation-related impacts of the options included in the EIS will also be evaluated and a preferred regional rail corridor will be determined. The EIS will also include evaluation of:

- radiological and non-radiological releases to the environment
- occupational and public impacts

Table 2-1. Meeting Locations and Attendance

Meeting Locations	Date	Total Attendance	Number of Verbal Commentors
Pahrump, NV	August 29, 1995	42	10
Boise, ID	September 6, 1995	35	7
Reno, NV	September 8, 1995	134	40
Chicago, IL	September 12, 1995	19	8
Las Vegas, NV	September 15, 1995	221	38
Denver, CO	September 19, 1995	50	10
Sacramento, CA	September 21, 1995	32	12
Dallas, TX	September 26, 1995	18	13
Caliente, NV	September 28, 1995	27	11
Salt Lake City, UT	October 5, 1995	30	13
Baltimore, MD	October 11, 1995	40	19
Albany, NY	October 13, 1995	34	17
Atlanta, GA	October 17, 1995	30	18
Kansas City, MO	October 20, 1995	23	10
Tonopah, NV	October 24, 1995	50	16
Totals		**785**	**242**

Table 2-2. Issue Categories Identified during Scoping for the Repository EIS

Issue Category	Number of Commentors[a]
Policy	323
NEPA Process	801
Proposed Action/Alternatives	392
Schedule and Licensing of Repository	5
Land Use	156
Air	7
Geology	51
Hydrology	29
Biology	162
Health and Safety	570
Transportation	1,036
Cultural and Historic Resources	175
Environmental Justice	20
Noise and Aesthetics	4
Performance Assessment	624
Cumulative Impacts	45
Mitigation (Financial Assistance)	280
Program/Project Cost	214
Socioeconomics	66
Accidents	25
General	1,257

a. Comments received from all sources.

- accidents, including those with low probability but high consequences
- criticality
- waste isolation, a long-term performance assessment to evaluate the ability of the repository to isolate the waste
- socioeconomic impacts including the effect on employment, tax base, and public services
- environmental justice
- pollution prevention
- impacts to soil, water, and air
- biological resources and impacts to plants, animals and habitat including threatened and endangered species
- cultural resources, the impact to archaeological/historical sites and Native American resources, and
- cumulative impacts from the proposed action and other past, present, and reasonably foreseeable future actions.

The text which follows provides a summary and compilation of issues raised during the public scoping process together with the general approach for resolution. The summarized comments are provided in Appendix A, Tables A.1-1 through A.21.

2.2.1 Policy

2.2.1.1 Policy Subissue (A)

Issue Summary A total of 323 people commented on issues of a policy nature. These issues are summarized in Appendix A, Tables A.1-1 through A.1-5. Specifically, a major group of issues focused on the limited scope of the EIS; many commentors requested the EIS evaluate the need for the repository, alternatives to geologic disposal, and alternative sites to Yucca Mountain. Others requested that the EIS evaluate the disposal of more than 70,000 MTHM of spent fuel, additional types of wastes, and alternatives if the repository cannot accommodate 70,000 MTHM, including a second repository. In contrast, some people believed that DOE should maintain the limited scope, but eliminate the No Action alternative.

General EIS Approach Although the EIS will not evaluate the need for the repository, alternatives to geologic disposal, or alternative sites, the EIS may , for purposes of analysis, evaluate the disposal of more than 70,000 MTHM of SNF and HLW and may include analysis of the disposal of other wastes, as discussed in Section 1.3. These analyses are being considered as a result of public comments provided during the scoping process. The EIS will include a No Action alternative. In response to public comment, DOE is considering evaluating expanded inventory “modules” in the EIS to analyze the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may require permanent isolation.

2.2.1.2 Policy Subissue (B)

Issue Summary Other commentors requested that the Repository EIS be deferred pending resolution of major programmatic issues including proposed new legislation, environmental release standards, and funding issues. Others questioned the short schedule for completing the EIS, with the stated concern that the results of ecosystem-based studies on the long-term consequences of the repository to future generations may not be available during preparation of the EIS. Others requested that the implementation plan describe where the results of these studies would be made public (for example, in supplemental EISs).

General EIS Approach DOE does not believe that Repository EIS should be deferred. The site recommendation must be accompanied by an EIS, and the Repository EIS will fulfill that mandate. The schedule for completing the Repository EIS by 2000 is based on the complexity and uniqueness of the program and the parallel timing of site characterization activities and license application development. The EIS will reference or summarize the results of available studies that are relevant to the long-term effects of the repository on future generations, and these references or appendices will be available for public review. Where studies have not been completed, the EIS will make assumptions that are founded in scientific evidence for purposes of analyses.

2.2.1.3 Policy Subissue (C)

Issue Summary Some commentors were concerned that Yucca Mountain was selected as the only possible site for a repository. Some cited Nevada's political weakness, and asserted that Congress and not science narrowed three possible sites to only one. Some wanted to know how the DOE planned to acquire control of the site considering that the consent of the Nevada Legislature is required. Others said that each shipment of waste entering Nevada should be taxed.

General EIS Approach In 1987, Congress directed the DOE to "provide for an orderly phase-out of site specific activities at all candidate sites other than the Yucca Mountain site" (NWPA). If Yucca Mountain is recommended by the Secretary of Energy and then by the President for development as a repository, the Governor and the legislature of the State of Nevada could notify Congress if they disapprove the site. This action would end the repository program in Nevada unless Congress enacts legislation to approve the site over the objections of the State of Nevada.

The Nuclear Regulatory Commission regulations require DOE to demonstrate that the land on which the geologic repository operations area and the controlled area would be located be either acquired and under DOE's control or be permanently withdrawn and reserved for DOE's use. Under Nuclear Regulatory Commission regulations, these lands would need to be free and clear of all encumbrances, such as those arising under general mining laws, easements for rights-of-way, leases, deeds, patents, and mortgages. These regulations and institutional controls will be discussed in the EIS. There are no provisions in the NWPA for Nevada, or counties in Nevada, to tax waste shipments entering the State.

2.2.1.4 Policy Subissue(D)

Issue Summary Commentors questioned if and under what conditions the DOE would recommend that Yucca Mountain is unsuitable for a repository. Some commentors questioned what DOE's plan would be if the site were found to be unsuitable. Others believed that the site would never be found unsuitable because of the large amount of money already spent, and they stated that the siting guidelines are revised when technical problems arise.

Some commentors wanted to know how the DOE planned to increase public confidence in the program's scientific basis and in DOE's management of the program. A few said the waste should be retrievable far beyond the 100 years planned by DOE, because the waste may become valuable in the future and because future technological advances may be able to neutralize the waste. Others were concerned that the accumulation of waste in one place, and waste transport, could offer opportunities for terrorism and weapons proliferation.

General EIS Approach DOE's site characterization and related work at Yucca Mountain has been, and continues to be, subjected to the scrutiny of Congress, the National Academy of Sciences, the Nuclear Waste Technical Review Board, the Environmental Protection Agency, the Nuclear Regulatory Commission, the State of Nevada, affected counties, and Native American Indian tribes. This scrutiny has helped to ensure the technical adequacy and credibility of DOE's evaluation, and to enhance public confidence in the scientific basis and management of the program. The EIS will evaluate waste retrievability for up to 100 years from start of emplacement (prior to repository closure) consistent with Nuclear Regulatory Commission regulations. The long-term performance assessment evaluates environmental impacts out to 10,000 years or to the time of peak dose if peak dose occurs at a later time. The potential for terrorism and weapons proliferation will be discussed in the EIS. The EIS will either discuss or reference: the Safety Analysis Report, as appropriate; the safeguard and security measures to be employed during waste transport and disposal; and for closure, prevention of the unauthorized removal of waste from the repository.

The NWPA directs DOE to evaluate the suitability of the Yucca Mountain site as a potential site for a geologic repository. If the Secretary of Energy determines that the site is suitable, the Secretary may then recommend that the President approve the site for development of a repository. Under the NWPA, any such recommendation shall be considered a major Federal action and must be accompanied by a final EIS. Accordingly, DOE is preparing the Repository EIS in conjunction with any potential DOE recommendation regarding the development of a repository at Yucca Mountain. The Repository EIS will analyze the potential environmental impacts of the construction, operation, and eventual closure of a repository at Yucca Mountain.

2.2.1.5 Policy Subissue (E)

Issue Summary Some commentors said the EIS should address construction of the exploratory tunnel and related facilities as a *de facto* repository. Commentors also said that baseline conditions should be those that existed prior to the start of site characterization. Another issue

was the safety of the repository considering that existing and proposed radiation-release standards allow for some radiation to escape from the repository.

General EIS Approach The NWPA authorized DOE to engage in appropriate site characterization activities to learn as much as possible about the site. The exploratory tunnel and related facilities are part of this site characterization program. The proposed action is to construct, operate, and close a repository. The purpose of the EIS is to assess the environmental consequences of this action on the affected environment. Thus for purposes of the EIS, the affected environment or "baseline conditions" will be those that exist, or are anticipated to exist, at the time the Draft EIS is issued for public comment.

The DOE is required to demonstrate compliance with the Environmental Protection Agency standards (yet to be finalized) for the Yucca Mountain project in its licensing application to the Nuclear Regulatory Commission. The EIS will analyze the long-term environmental impact, if any, from waste disposal.

2.2.1.6 Policy Subissue (F)

Issue Summary Other policy comments were related to transportation, uncertainty in predicting long-term performance, the relationship of the Repository EIS to other DOE or other agency EISs currently in preparation, and the liability and responsibility of potential accidents at the repository. Specifically, these commentors were concerned about: (1) how the transportation analysis would be done and what the scope of this analysis would be (e.g., would it be conducted on a mile-by-mile basis and include emergency-response measures); (2) how to predict future events and have confidence in assumptions that are made; (3) the relationship between the Repository EIS, the U. S. Navy Multi-Purpose Container System EIS, and the NTS EIS; and (4) what agencies are liable in the event of an accident involving nuclear waste.

General EIS Approach Section 2.2.11 of this document discusses the scope of the transportation analysis which will analyze representative transportation corridors; however, the impacts will not be discussed on a mile-by-mile basis. Emergency response and safeguards and security during transportation will also be discussed. The long-term performance assessment that will be conducted for the Repository EIS is discussed in Section 2.2.15 of this document. As noted previously, the performance assessment will identify events and processes that bound the potential environmental impacts from emplacing SNF and HLW. The relationship between the Repository EIS and other DOE and non-DOE EISs, including the two mentioned above, is discussed in Section 1.4 of this document. As noted in Section 2.2.19 of this document, the Repository EIS will discuss organizations having financial responsibilities for emergency response and preparedness as well as responsibilities to remediate accidents from either transportation or repository operations.

2.2.2 NEPA Process

Issue Summary Eight hundred and one (801) people commented on issues related to NEPA requirements and procedures. These issues are summarized in Appendix A, Table A.2.

Specifically, the comments related to maximizing participation in the public scoping process, preparing the Implementation Plan, conducting consultations as required by the NEPA process, the content of the Record of Decision, and performing the impact analysis. Some commentors wanted meetings and hearings to be held in their particular communities, especially if SNF or HLW would be transported through their community. Other commentors stated that insufficient notice and inadequate information were provided relative to the public scoping meetings. Others requested that either the meeting format or the scoping process be modified to encourage broader public participation, provided suggestions for the content of the Implementation Plan and the Record of Decision, and made suggestions and recommendations regarding consultations to be conducted as part of the NEPA process**.** Other commentors made general recommendations about conducting the impact analysis for the EIS.

General EIS Approach Section 2.1 of this document describes the scoping process for the EIS and the DOE efforts to provide opportunities for public involvement in the process. The location of meetings and hearings during the public comment period for the Draft EIS has not been selected. As discussed in Section 1.1, although an Implementation Plan will not be prepared for the Repository EIS, this comment summary document was prepared to summarize the issues identified during the scoping period for the EIS and to discuss the general approach for how these issues will be addressed in the EIS. Analyses that are planned for specific issues identified during scoping are discussed in this section.

2.2.3 Proposed Action and Alternatives

Issue Summary Three hundred and ninety-two (392) people commented on issues related to the proposed action and alternatives to be evaluated in the EIS. These issues are summarized in Appendix A, Table A.3. Specifically, the comments related to expanding the scope of the EIS to include analysis of: disposal of all projected SNF and HLW, as well as other highly radioactive wastes; evaluation of alternatives to geologic disposal; additional options for transportation routing and modes and packaging; alternatives for implementing each phase of the repository (construction, operation, and closure); and additional thermal management strategies. Issues related to the evaluation of the No Action alternative included comments that the evaluation should include impacts at waste generator sites in the event that a repository at the Yucca Mountain site would not be constructed. Other issues focused on the EIS providing a thorough and equivalent level of discussion for all alternatives and all wastes and waste characteristics.

General EIS Approach The EIS will evaluate a proposed action to construct, operate, and eventually close a repository at Yucca Mountain for the geologic disposal of 63,000 MTHM of commercial SNF and 7,000 MTHM of DOE SNF and HLW. Four alternatives will be evaluated; three implementing alternatives for the proposed action and a No Action alternative. The implementing alternatives will be based on thermal load objectives; namely, a high thermal load that considers the emplacement of greater than 80 MTHM per acre, an intermediate thermal load of between 40 and 80 MTHM per acre, and a low thermal load of less than 40 MTHM per acre. Based on the comments received, DOE is considering presenting incremental analyses of the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may

require permanent isolation.

As part of each implementing alternative, two packaging options will be evaluated. Under Option 1, SNF assemblies would be packaged and sealed in multi-purpose canisters at the generator sites prior to being transported in casks to the repository. HLW would be packaged and sealed in canisters prior to shipment in similar casks. Under Option 2, SNF assemblies (without canisters) and sealed canisters of HLW would be transported to the repository.

Each implementing alternative will also evaluate five transportation options, two national and three regional (i.e., within the state of Nevada). For the national transportation, the first option would consist of shipping all SNF and HLW by truck, from the generator site to the repository. The second national option would consist of shipment by rail, except from those generator sites that do not have existing capabilities to load and ship rail casks. For the regional transportation, there are three options; two apply to shipments that would arrive in Nevada by rail, and the third applies to shipments that would arrive by truck. The first regional transportation option would evaluate several rail corridors to the repository, leading to the selection of one preferred rail corridor. The second regional transportation option would involve the use of heavy haul truck routes to the repository, including the construction and operation of an intermodal transfer facility to receive shipments that would arrive by rail. The third regional transportation option would involve legal weight truck shipments from the generator sites directly to the repository.

Under the No Action alternative, a geologic repository at the Yucca Mountain site would not be operated. SNF and HLW would continue to accumulate at the 75 commercial nuclear reactor sites and at DOE facilities. Any existing equipment and facilities at the Yucca Mountain site (for example, the exploratory studies facility and support facilities) could be reclaimed, dismantled and removed for reuse, recycling, or disposal as appropriate.

The No Action alternative will be analyzed by evaluating a generic commercial nuclear reactor site and continued storage at DOE facilities using the following assumptions. Storage containers at commercial sites would be routinely monitored for corrosion and repackaged as necessary to comply with safety requirements. The DOE-owned SNF would continue to be stored at the Hanford Site, the Idaho National Engineering Laboratory, and the Savannah River Site. The commercial site and DOE facilities would continue to be operated for a period of 100 years to ensure public health and safety, after 100 years institutional control is assumed to be lost.

2.2.4 Schedule and Licensing of Repository

Issue Summary Five commentors asked about the schedule for, and licensing of, the repository. These comments are summarized in Appendix A, Table A.4. The comments focused on DOE's responsibility to begin accepting waste shipments in 1998, the schedule for submitting a license application to the Nuclear Regulatory Commission, and whether this schedule is the driver for DOE starting scoping hearings in 1995. Another comment related to why so many years are required between scoping and licensing.

General EIS Approach The legislative history of the repository program and DOE's efforts to meet Congressionally-mandated and other requirements of the program will be discussed in the background section of the EIS. This section will also discuss legislative mandates that have evolved over the past 14 years, as well as regulatory drivers that apply to the repository program. In 1996, the U.S. Court of Appeals for the District of Columbia [*Indiana Michigan Power Company, et al. vs. Department of Energy and United States of America, et al.*, 88 F.3d 1272 (D.C. Cir. 1996)] ruled, in response to a petition filed by various utilities, public utility commissions, and states attorneys general, that DOE is obligated to start disposing of SNF from standard contract holders no later than January 31, 1998, under the terms of the NWPA. However, the Court also found that since that date has not yet arrived, it is premature to determine an appropriate remedy because no violation of the NWPA or Standard Contract terms has yet occurred. The NEPA process for the Repository EIS (i.e., from publication of the Notice of Intent to preparation of a Record of Decision) is scheduled to take about five years to ensure that appropriate data gathering and tests are performed to adequately assess potential environmental impacts, and to allow the public sufficient time to consider this complex Program and provide input. The preparation of a license application will parallel the preparation of the Repository EIS and rely on much of the same technical information. The license application is currently scheduled to be submitted to the Nuclear Regulatory Commission in 2002. Based on comments received regarding DOE's responsibility to begin accepting waste by 1998, DOE is considering incremental analysis for receipt of waste at Yucca Mountain prior to full operation of the repository.

2.2.5 Land Use

Issue Summary One hundred and fifty-six (156) people commented on land use. These comments are summarized in Appendix A, Table A.5. The issues focused on the effects of constructing and operating the repository and related facilities (such as a rail line, heavy-haul roads, and transfer stations) and on the use and management of land. Commentors were concerned about consistency with existing land use plans, about the use of rights-of-way and eminent domain for repository components, and about potential impacts on recreational uses and grazing. Other issues dealt with coordinating regional councils, cleanup standards, public access across transportation corridors in Nevada, and potential conflicts with U.S. Air Force operations on the adjacent Nellis Air Force Range Complex. Ecosystem management at Yucca Mountain and consistency with the DOE's Land Facility Use Management Policy and the Resource Management Plan for the NTS, were also concerns.

General EIS Approach Land ownership and major land use in the region of influence for Yucca Mountain will be discussed in the EIS. The land ownership and land use along regional transportation routes and other Nevada-based repository facilities will also be discussed. Impacts to land resources in the region of influence from construction and operation of the repository will be examined in the EIS. This will include analysis of land withdrawal and potential impacts on the NTS and at the Nellis Air Force Range Complex, to public and private lands, and to State and other Federal lands. Land-use impacts from potential land acquisition and construction and operation of new rail-lines, heavy-haul roads, and transfer facilities in Nevada will also be

evaluated. The total acreage to be disturbed for each major component of the repository (surface and subsurface facilities, rail line, new roads, etc.) and during each phase of the program (construction, operation, and closure) will be discussed. The impacts of co-located Yucca Mountain and NTS operations will be evaluated in the analysis of cumulative effects.

2.2.6 Air Quality and Meteorology

Issue Summary Seven people commented on air quality and meteorology. These comments are summarized in Appendix A, Table A.6. Comments focused on how constructing and operating the repository and related facilities (rail line, heavy-haul roads, and waste-transfer facilities) could degrade air-quality, affect health from exposure to airborne radiation, and impair visibility which could reduce the safety of waste transport.

General EIS Approach Existing air quality in potentially affected air basins in Nevada will be characterized in the EIS. Class-I air-quality areas within the Yucca Mountain region of influence and other potentially affected areas, if any, in Nevada will be identified. Meteorological conditions such as severity and type of storms, temperature extremes, and precipitation will be described.

Potential impacts to air quality from routine air emissions to the atmosphere during each phase of the repository program will be estimated for potentially affected air basins in Nevada. The air emissions from the repository and related facilities in Nevada will be compared to State and Federal ambient air-quality standards and health effects will be estimated. Cumulative impacts to air quality will consider existing and anticipated future actions at Yucca Mountain, the Nellis Air Force Range Complex, the NTS, and other sources of air pollutants, such as nearby mining operations and nearby cities.

2.2.7 Geology

Issue Summary Fifty-one (51) people commented on geology. These comments are summarized in Appendix A, Table A.7. Comments focused on predicting earthquakes and the effects from earthquakes, and predicting the effect of volcanism on repository operations and long-term transport of radionuclides. The validity of geologic mapping including identifying faults and joints and the effect on the rock of underground weapons-testing at the NTS were also issues. The transport of radioactive and hazardous materials that could spill and potentially migrate into the subsurface rock at Yucca Mountain were also concerns. Other comments related to identifying paleontologic sites that could potentially be impacted by the proposed actions, to assessing the mineral-resource potential of areas withdrawn for the repository, and to indicating whether DOE would monitor and numerically model surface subsidence caused by underground excavations.

General EIS Approach The geologic conditions that could affect long-term containment of disposed radioactive material will be described in the EIS including seismicity, geologic structure, and the volcanism of the region. The results of seismic hazard analyses and the

seismic design of the facility will also be discussed. Any paleontologic sites that could be affected by construction and operation of the repository will be described and the mineral-resource potential of areas that may be withdrawn will be assessed. The groundwater quality will be discussed and data will be reviewed to determine if there are effects from past weapons-testing on the NTS or from spills and from the intentional injection of tracers during characterization of the Yucca Mountain site. Data collected to support site characterization activities (i.e., information on rock properties) will be analyzed to assess the likelihood and potential consequences of subsidence. Attributes related to geology, such as topography, soil erodability, landslide potential, and faults and subsidence zones are being included in the criteria to be used for the selection and evaluation of rail alignment and heavy haul routes. The geologic setting along rail and truck routes in Nevada and throughout the nation will not be described in detail.

The effect of uncertain long-term geologic events will also be discussed in the EIS. The potential effects on the rock at Yucca Mountain from past testing of nuclear weapons at the NTS will be discussed in the EIS using the best available data. The economic impacts, if any, of precluding development of mineral resources in areas that may be withdrawn will be discussed in the EIS as described in Section 2.2.5. The EIS will address compliance with all regulatory requirements.

2.2.8 Hydrology

Issue Summary Twenty-nine (29) people commented on hydrology. These comments are summarized in Appendix A, Table A.8. The comments focused on the regional impacts of the repository and for waste transport relative to the quality and quantity of surface water and groundwater; how the effects on surface water and groundwater would be analyzed; and that additional characterization of the deep aquifer system was required to determine the potential effect on groundwater quality in areas such as Amargosa Valley, Ash Meadows, and Death Valley National Park. Some commentors were concerned with the nature and extent of contamination, groundwater monitoring, the possibility of long-term changes in the elevation of the groundwater table, flooding, and the potential for a nuclear criticality. Other commentors were concerned about DOE being in compliance with Nevada water-rights regulations.

General EIS Approach The hydrologic characteristics of the Alkali Flat-Furnace Creek Ranch groundwater basin, where Yucca Mountain is located, will be described in the EIS. The mechanics of flow and water quality in the saturated and unsaturated zones at Yucca Mountain and in areas such as Amargosa Valley, Ash Meadows, and Death Valley National Park will also be described.

Groundwater monitoring has been ongoing for the last eight years and will continue to be conducted at the site. The EIS will discuss the need for and the extent of a pre-closure groundwater-monitoring network. The need for a post-closure monitoring network would be based in part on the results of pre-closure monitoring. As a result, the need for and details of a post-closure groundwater-monitoring network will not be included in the EIS.

The EIS will describe the possible environmental impacts from water in the repository environment. Potential mechanisms include percolation of surface water downward through the unsaturated zone along fractures and through the rock matrix, and from a potential rise in the elevation of the water table from regional and global climate changes over thousands of years. (The underground repository would be constructed in unsaturated rock about 700 feet above the water table.) The EIS qualitatively describe (1) the effects of reasonably feasible future climatic extremes on the flow of groundwater and the elevation of the water table in the vicinity of Yucca Mountain, (2) the likely cause and meaning of the elevated concentrations of tritium found in the unsaturated zone at Yucca Mountain, and (3) the likelihood of deep-seated hot water invading the repository.

The EIS will also qualitatively describe the potential impacts on water quality and water flow at springs and wells in the Alkali Flat-Furnace Creek Ranch groundwater basin.

2.2.9 Biology

Issue Summary One hundred sixty-two (162) people commented on issues related to biology. These comments are summarized in Appendix A, Table A.9. The concerns focused on impacts to critical habitat for threatened, endangered, and sensitive species and other biologic resources from implementing the repository program. Specific issues included concerns about potential changes in the surface ecosystem at Yucca Mountain from waste-generated heat and impacts to wildlife and their habitat from both repository construction and operation and from transporting waste. Other commentors were concerned about the effects on wilderness and public recreation areas from construction and operation of national and regional waste-transportation corridors and the potential loss of revenue from the loss in big-game habitat.

General EIS Approach The EIS will describe biological resources within affected areas in Nevada including threatened, endangered, and sensitive species (i.e., species of concern to the State of Nevada) and game species. Potentially affected areas include Yucca Mountain and portions of the Alkali Flat-Furnace Creek Ranch groundwater basin, potential waste-transfer sites in Nevada, and waste-transport corridors in Nevada.

The EIS will evaluate impacts to wildlife and wilderness and public recreation areas at and near Yucca Mountain from construction and operation of the repository based on currently available information. Post-closure effects to wildlife from a potential increase in heat at the surface by implementing the various alternatives will also be evaluated. Attributes related to biology, such as terrestrial habitats, floodplain and wetland communities, protected areas, federal and state threatened and endangered species, and other special status species will be included in the criteria to be used for the selection of rail alignments and heavy haul routes. Potential for loss of game habitat will be assessed.

2.2.10 Health And Safety

Issue Summary Five hundred seventy (570) people commented on issues related to health and safety. These comments are summarized in Appendix A, Table A.10. Specific concerns included requests for baseline health assessments of potentially affected areas, concerns about past radiation exposure, radiological impacts during operations and after closure, exposure pathways and scenarios that would be evaluated, and the effects of radiation on Native Americans and agriculture from human error and nuclear arms proliferation.

General EIS Approach The Repository EIS will characterize the baseline affected environment using the best available data. Past radiation exposures from activities at the NTS (e.g., from atmospheric testing) will be considered in the cumulative impacts section of the EIS using existing published studies. The radiological impacts to workers and the public including Native Americans will be analyzed in the EIS, for both the pre-closure time period, which includes transportation, and the post-closure time period. Potential worker doses will be evaluated assuming both normal operations and accident conditions. Radiological impacts to the public during all phases of repository activity (construction, operation, closure, and post-closure) will be assessed.

2.2.11 Transportation

2.2.11.1 Transportation Subissue (A)

Issue Summary One thousand thirty-six (1,036) people commented on issues related to transportation. These comments are summarized in Appendix A, Tables A.11-1 through A.11-7. Issues raised by commentors included transportation routing, transportation accidents, human health impacts related to transportation, transportation emergency response, transportation shipping containers, pre-notification, liability after transportation accidents, sabotage or terrorist attacks, and the economic impacts of transportation accidents.

General EIS Approach The Repository EIS will analyze the radiological and nonradiological impacts of shipping radioactive material to the repository. The impact analyses will include the impacts from both normal operations and accidents. The impacts from transporting radioactive material will include the risks to populations surrounding and sharing the transportation routes, to transportation workers, and to populations and the maximally exposed individual as a result of transportation accidents. The transportation accident analyses will include the risks from low probability/high consequence accidents and the risks from high probability/low consequence accidents. The EIS will include a detailed discussion of the transportation risk assessment methods and models, and the data used in the transportation analyses will also be presented. For example, shipment numbers and shipping container capacities and inventories will be presented.

Transportation issues such as pre-notification, emergency response, liability, transportation regulations (e.g., U.S. Department of Transportation and Nuclear Regulatory Commission regulations) and orders (e.g., DOE Orders), and safeguards and security issues will be discussed in the EIS. Sabotage or terrorist attacks will also be discussed.

The Repository EIS transportation analyses will include both truck and rail transport. The highway transportation analyses will be based on Department of Transportation routing regulations for the transport of radioactive materials. These regulations will be discussed in the EIS. The transportation analyses will use representative transportation routes and actual route characteristics, such as distances, population statistics, and state-level accident rates.

2.2.11.2 Transportation Subissue (B)

Issue Summary Commentors also offered criteria for the evaluation and selection of the rail alignments and heavy haul routes within Nevada. These criteria included attributes such as cost, land use, engineering feasibility, environmental impacts, transportation safety and risk, potential for shared use, availability of data, conflicts with U.S. Air Force operations, and cultural resources.

General EIS Approach Many of the criteria offered by commentors have been incorporated into the selection and evaluation criteria. For example, criteria related to environmental impacts, such as the impacts to water resources, land forms and geology, air quality and biological resources have been incorporated. The detailed criteria used to evaluate and select the rail alignments and heavy haul routes will be presented in the EIS.

2.2.12 Cultural And Historic Resources

Issue Summary One hundred seventy-five (175) people commented on issues related to cultural resources and Native American concerns. These comments are summarized in Appendix A, Tables A.12-1 and A.12-2. Commentors requested that the EIS include the results of detailed cultural-resource surveys at Yucca Mountain and along transportation routes and that the EIS evaluate historical and prehistorical sites, as well as paleontological resources. Other commentors were concerned about the effect of the Repository program on Native American cultures. People also requested that the Repository EIS fulfill commitments made in the 1986 Environmental Assessment of Yucca Mountain; that the Repository EIS be used as a forum for government-to-government relations; and that the Repository EIS acknowledge the differences between Western civilization and Native Americans with regard to nature. Among the specific comments received included the request to describe Native American land claims in Nevada, treaty obligations, federal laws relating to cultural and religious rights of Native Americans, unsettled political and legal issues, and the application of Indian law to the repository.

General EIS Approach Prior to any planned construction at Yucca Mountain, or within transportation corridors, the DOE would conduct surveys for cultural and historic resources and report the findings to the Nevada State Historic Preservation Officer and the Advisory Council on Historic Preservation. The results of available surveys, as well as studies of resources, will be discussed in the EIS.

The Yucca Mountain Project has maintained a Native American Interaction Program since the late 1980s. This interaction program involves Official Tribal Contact Representatives appointed from 17 tribes and organizations from Nevada, California, Arizona, and Utah. These

Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone people have provided important cultural resource protection information to the project. These interactions will be documented in the EIS.

The DOE recognizes that Native American land claims in Nevada have been an issue of much concern among Native American groups, especially the Western Shoshone. The DOE, however, must abide by recent rulings by the U.S. Supreme Court concerning control of land in much of southeastern Nevada, including the Yucca Mountain area. Applicable land claims issues, treaties, and Federal requirements concerning Native Americans and cultural and religious rights will be discussed in the EIS.

2.2.13 Environmental Justice

Issue Summary Twenty people (20) commented on environmental justice issues. These comments are summarized in Appendix A, Table A.13. Several commentors noted that the EIS must perform an environmental justice analysis consistent with federal directives and comply with federal statutes regarding environmental justice. Commentors stated the analysis should include consideration of disproportionate effects on certain communities, including poor, rural, people of color, any other subgroup of the U.S. population, and any Native American group. Commentors also indicated the EIS also should acknowledge that the Yucca Mountain site and NTS is Western Shoshone land, in consideration of the reserved right of the Western Shoshone Indian Nation.

Most of the 20 commentors indicated that the EIS should fully assess equity concerns by evaluating potential disproportionate impacts on each affected economic, ethnic or racial group along transportation routes. They requested that the assessment should consider emergency response and preparedness capabilities, and the need for training and education of each affected group.

In addition, commentors requested that the EIS consider previous disproportionate impacts citing past and current radioactive and hazardous waste activities at the NTS, and DOE's preferential financial assistance to the affected units of local government, but not certain Indian tribes. The latter was noted by commentors to be in conflict with DOE's Indian policy.

General EIS Approach The EIS will include an evaluation of environmental justice issues as they pertain to the DOE's proposed action of constructing, operating, and closing a repository at Yucca Mountain. Although DOE has not yet developed its detailed analytical approach for environmental justice, the evaluation will be consistent with both the Council on Environmental Quality and DOE guidance for implementing the Environmental Justice Executive Order 12898.

As part of developing the approach for the Repository EIS, in addition to consideration of scoping comments, DOE will also closely review many of the recently completed EISs which address management of SNF, weapons materials and highly radioactive wastes (including the Programmatic Spent Nuclear Fuel Management EIS, the EIS on a Proposed Nuclear Weapons

Nonproliferation Policy Concerning Foreign Research Spent Nuclear Fuel, the Programmatic Waste Management EIS, the Storage and Disposition of Weapons-Usable Fissile Materials Programmatic EIS, the Stockpile Stewardship and Management Programmatic EIS, the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components EIS, and the Department of the Navy's final EIS for a Container System for the Management of Naval Spent Nuclear Fuel). Based on this review, and where it makes sense to do so, DOE may use and adapt the approaches and methodologies used for environmental justice analyses by these other EISs. This is consistent with the Council on Environmental Quality regulations which encourage agencies to reduce excessive paperwork in preparation of EISs by incorporating by reference and eliminating repetitive discussions.

DOE acknowledges that there is significant disagreement among the Native American Indian community concerning the Ruby Valley Treaty of 1863 and the lands addressed under that Treaty. DOE must abide by the U.S. Supreme Court rulings. It is not the role or function of the EIS to address or attempt to resolve disputes over such Treaty rights.

Rather, the EIS will evaluate, in accordance with established NEPA precedents, the potential environmental impacts that may be associated with the construction, operation, and eventual closure of a repository at Yucca Mountain. This evaluation of the proposed action will include the potential impacts from transporting spent fuel and HLW along both national and regional transportation routes. The environmental justice evaluation that is developed for the EIS will include consideration of transportation-related effects (also see Section 2.2.11 for additional information regarding transportation analyses). As already mentioned above, DOE will be reviewing many other recently completed EISs for their approaches, methodologies, and scope of analyses. Several of these EISs consider in some detail the potential impacts associated with transportation of spent fuel, weapons materials, and highly radioactive wastes, and also discuss the environmental justice issues that may be raised by potentially extended shipping campaigns involving these materials. DOE also plans to coordinate with the U.S. Department of Transportation to obtain any guidance it may have developed for purposes of implementing the Environmental Justice Executive Order 12898.

2.2.14 Noise And Aesthetics

Issue Summary Four people commented on noise and aesthetics. These comments are summarized in Appendix A, Table A.14. Commentors stated that the EIS should assess baseline and project-induced noise levels along waste-transport routes in Lincoln County and at other County sites where repository facilities and activities would be located (intermodal transfer sites, borrow sites, highway-construction sites, and heavy-haul routes) and that impacts to the quality of life and to wildlife should be evaluated.

General EIS Approach The existing baseline noise environment and visual setting at Yucca Mountain and along transportation routes in Nevada will be characterized in the EIS. The impact on the environment from noise generated at the repository, at the intermodal-transfer facilities, and during construction of transportation routes in Nevada will be assessed. The visual impact of

the repository and of other waste-handling facilities in Nevada, and of operating a rail line in Nevada will also be assessed in the EIS. The analysis for potential impacts to wildlife was described in Section 2.2.9.

2.2.15 Performance Assessment

Issue Summary Six hundred twenty-four (624) commentors were concerned about the performance assessment to be conducted for the geologic repository. These comments are summarized in Appendix A, Table A.15. Eight specific issues were identified that related to: the type of events and processes that should be evaluated in the Repository EIS, the identification of engineered barriers and the ability of waste packages to maintain integrity over thousands of years, the methods used to conduct the performance assessment and evaluate uncertainty, the prediction of human intrusion, the identification of performance measures and institutional controls, the analytical time frame for the performance assessment, and the prediction of potential future impacts.

General EIS Approach. The Repository EIS performance assessment will assess events and processes that bound the potential environmental impacts from emplacing SNF and HLW, including those events and processes having low-probabilities of occurrence, but resulting in high consequences. Total system performance assessments prepared by DOE since 1993 evaluate the ability of the overall system to meet the performance objectives/measures identified in the applicable regulatory standards. These assessments explicitly acknowledge the uncertainty in the process models and parameters and evaluate the impact of this uncertainty on the overall performance.

The proposed engineered features to contain the waste packages will be described in sufficient detail to support the long-term performance assessment. The performance assessment will evaluate degradation of the waste packages given different thermal loads and consider infiltration rates, corrosion models, and other relevant factors. This analysis will consider both manmade and natural materials to retard the movement of radionuclides from the waste packages. Assumptions made for purposes of analysis will be documented in the EIS.

Intruder scenarios to be evaluated in the Repository EIS will be consistent with those required for potential licensing by the Nuclear Regulatory Commission. Non-fatal and fatal latent cancers will be reported in the Repository EIS. The analytical time frame for the Repository EIS will focus on a period of 10,000 years. Analysis will be extended to the time of peak dose and the results used qualitatively. Institutional controls to be implemented will also be described.

2.2.16 Cumulative Impacts

Issue Summary Forty-five (45) people commented on the scope of the analysis for cumulative impacts. These comments are summarized in Appendix A, Table A.16. Specific concerns were that the analysis consider the cumulative radiological risks and hazards from all past, current and

proposed activities involving radiological material not only at Yucca Mountain but at the NTS and other areas where radioactive material has been managed. Commentors were also concerned about the cumulative radiological effects on the human and natural environment from all past, present, and proposed activities involving radioactive material. Other commentors requested that the cumulative impacts section of the EIS address an inventory greater than the 70,000 MTHM limit imposed by the NWPA.

General EIS Approach DOE is considering options to evaluate the disposal of all commercial SNF and HLW, all DOE-owned SNF and HLW, and other wastes that are compatible with a repository environment. The cumulative impact analysis in the Repository EIS will also evaluate the impacts to the environment from past, present, and reasonably foreseeable activities at the NTS, the Beatty low-level waste disposal site, the Nellis Air Force Range, and from the potential shipment of other radioactive materials to the repository as described in Section 1.4. This analysis will include the cumulative impacts to both humans and the natural environment from transporting radioactive material from commercial and DOE sites as discussed in Section 1.4.

2.2.17 Mitigation

Issue Summary. Two hundred eighty (280) people commented on mitigation measures. These comments are included in Appendix A, Table A.17. The primary concern was that the EIS and the resulting Record of Decision and Mitigation Action Plan include and evaluate specific measures to mitigate all impacts, both from routine operations and potential accidents. In addition, commentors indicated that financial compensation should be provided to communities and individuals that could be affected by any phase of repository operations. One commentor indicated that the EIS should more fully consider the options for implementing assistance as required by Section 180(c) of the NWPA.

General EIS Approach The EIS and Record of Decision will discuss measures to mitigate adverse impacts, as necessary. General types of mitigation to be considered include: (1) impact avoidance by, for example, not undertaking certain activities, (2) impact minimization by limiting the degree or extent of certain activities, (3) impact rectification by repairing, rehabilitating, or restoring the affected environment (e.g, surface reclamation), (4) impact reduction or elimination over time, and (5) impact compensation by replacing or providing substitute resources.

Mitigation measures that are included in the Record of Decision will form the basis of DOE's Mitigation Action Plan. Pursuant to DOE regulations, the Mitigation Action Plan will explain how the mitigation measures will be planned and implemented. Following implementation, periodic status reports that address each mitigative measure will be prepared. The Mitigation Action Plan, like the EIS and Record of Decision, will be publicly available.

Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to those States and Indian Tribes in which SNF and HLW will be transported. The assistance and funds are to cover procedures for safe routine transportation, as well as procedures for dealing

with emergency response situations. The EIS will discuss these requirements as well as the status of any relevant planning. However, options for implementing Section 180(c) will not be evaluated in the EIS.

2.2.18 Program/Project Cost

Issue Summary Two hundred fourteen (214) people commented on the cost of the proposed project. These comments are summarized in Appendix A, Table A.18. Specific concerns were related to conducting a total life-cycle cost estimate for each alternative for each phase of repository development (i.e., construction, operation, closure) including transportation. Other comments were concerned about who has financial responsibility for operating the repository and who would have financial responsibility in the event of an accident. Commentors were also concerned about the funding source for the program and requested that the EIS consider funding constraints in the analysis of costs including the analysis of a funding shortfall.

General EIS Approach DOE will consider estimates of the total system life-cycle costs for construction, operation, and closure of the repository as a relevant factor in making a final decision on the proposed action. However, costs will not be addressed in the EIS. The EIS will discuss both Nuclear Waste Fund and DOE funding as they pertain to financial responsibility for development, operation, and closure of the repository. The EIS will also describe organizations having financial responsibilities for emergency response and preparedness as well as responsibilities to remediate accidents from repository operations or transportation.

2.2.19 Socioeconomics

Issue Summary Sixty-six (66) people commented on issues related to socioeconomics. These comments are summarized in Appendix A, Table A.19. The issues focused on what populations should be evaluated and what attributes should be analyzed; the definition of the baseline affected environment; what data should be used as input into the socioeconomic analysis, the appropriate level of analysis and the methodology that would be used to conduct the analysis. Other commentors requested that the EIS discuss mitigation of socioeconomic impacts and that uncertainties, including data and future funding problems that might affect socioeconomic impacts, be described and the impact of these uncertainties be explained.

General EIS Approach The socioeconomic sections of the document will assess the impacts on local and regional socieconomic conditions considering attributes such as population, employment, economy, housing, and public finance. The EIS will use a baseline consistent with when the Draft EIS is released. Baseline information at the state, county and, where appropriate, local levels will be described including economic fiscal conditions and structure; population distribution; community services; social structure; and culture and lifestyle. Baseline data will be gathered from many sources that could include the State of Nevada, counties and cities in Nevada, and Native American groups.

The EIS will evaluate the socioeconomic impact in Nevada from implementing the repository program for each program phase. Potential socioeconomic impacts will be evaluated in a region of influence defined to assess localized effects around the site in addition to conducting a regional analysis to determine the effects on the economy. The EIS will identify key assumptions of the socioeconomic analyses. If major uncertainties are identified, the sensitivity of the analysis will be discussed.

Possible measures to mitigate socioeconomic impacts may be described in the EIS. Based on public input on the Draft EIS, these measures may be modified for the Final EIS. The Record of Decision will reflect DOE's commitment to certain mitigation measures.

The selection of a rail route in Nevada will consider economic, social, engineering, land use, and environmental factors. The EIS will either describe the criteria and rationale used to select the route.

2.2.20 Accidents

Issue Summary Twenty-five (25) people commented on accidents. These comments are summarized in Appendix A, Table A.20. Specific concerns were the identification of credible accident scenarios including analysis of an accident involving terrorist attacks or sabotage, the potential risk to the public from an accident, identification of evacuation routes, cleanup after an accident, impacts on the tourism business, and compensation for accident victims.

General EIS Approach The Repository EIS will identify a set of credible accident scenarios to evaluate. Accidents that could occur during the transportation phase, the construction and operation of the repository, and the post-closure phase will be assumed. For the post-closure phase, the principal accident initiators that will be considered are natural phenomena (e.g., a design basis earthquake). The suite of accidents to be evaluated will include a low probability, high consequence event to bound the potential environmental impacts. The impacts to the worker, maximally exposed individual, and off-site populations will be assessed. Intruder scenarios to be evaluated during post-closure will be those consistent with Nuclear Regulatory Commission requirements as described in Section 2.2.15.

2.2.21 General

Many commentors provided views and comments that were not related to the scope of the Repository EIS and therefore could not be used to guide the preparation of the EIS. These comments are summarized in Appendix A, Table A.21. While these comments provide a gauge of public sentiment on the program, they were not related to the content of the proposed action. Examples of comments that were placed into this category include: statements both in general opposition to and in general support of Yucca Mountain, repositories, and nuclear power; statements of distrust of the DOE or project opponents; opposition to transporting radioactive material; stated preferences for DOE to select the "No Action" alternative (absent of any environmental analysis); comments directed toward the public criticizing a perceived lack of the

public's willingness to be involved; criticism and support for the NEPA process; comments on unrelated DOE activities; and, criticism of DOE and that decisions had already been made prior to the NEPA process.

REFERENCES

DOE 1986. *Environmental Assessment, Yucca Mountain Site, Nevada Research and Development Area, Nevada,* DOE/RW-0073.

DOE 1995a. *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement,* DOE/EIS-203-F.

DOE 1995b. *Draft Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste,* DOE/EIS-0200-D, August.

DOE 1996a. *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada*, DOE/EIS-0243, August.

DOE 1996b. *Final Environmental Impact Statement for the Tank Waste Remediation System, Hanford Site, Richland, Washington,* DOE/EIS-0189, August.

DOE 1996c. *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement,* DOE/EIS-0229, December.

FR 1995a. 60 FR 40164, "Preparation of an 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," U.S. DOE, August 7.

FR 1995b. 60 FR 11756, "Intent to Prepare Environmental Impact Statement for the Proposed Master Land Withdrawal Naval Air Station Fallon, Nevada," May 12.

FR 1996a. 61 FR 25092, "Record of Decision for the Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel," U. S. DOE, May 17.

FR 1996b. 61 FR 27054, "Nellis Air Force Range Legislative Environmental Impact Statement," May 30.

FR 1997. 62 FR 3014, "Record of Decision for the Storage and Disposition of Weapons-Usable Fissile Materials Final Environmental Impact Statement," U.S. DOE, January 21.

U.S. Navy (Department of the Navy) 1996. *Final Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel*, November.

Nuclear Waste Policy Act of 1982, as amended.

Appendix A: Summary Table of the Public Scoping Comments

Table A.1-1. General Policy

Subissue (key words)	Comment Summary
1 (Alternatives outside of NWPA; interim storage; foreign spent fuel)	Many commentors requested that DOE restructure the EIS's proposed action and alternatives stating that the NWPA does not preclude DOE from examining: (1) the need for the repository, (2) alternatives to geologic disposal (including recycling, storing wastes at the vitrification site, developing methods of waste remediation and destruction, using the waste for beneficial purposes, and launching the waste into space), (3) alternative sites to Yucca Mountain (including at-reactor dry-cask storage, interim storage, leaving foreign wastes in countries that generate the wastes thereby linking nuclear proliferation with the consequences of waste disposal), and (4) the timing of repository availability. Consistent with this restructuring, commentors suggested that the EIS evaluate the disposal of more than 70,000 MTHM, alternatives if less than 70,000 MTHM are disposed, the likelihood of a second repository, the disposal of additional wastes (surplus plutonium, highly enriched uranium, Greater than Class C), and the impacts of developing a low-level waste repository at Yucca Mountain. In contrast, other commentors said the Congressional intent not to require such analyses in the EIS should be followed, waste forms examined should be limited to SNF and HLW, and that the no-action alternative should not be examined. (93 commentors)
2 (National security issues; strategic issues; terrorism)	Several commentors requested that the EIS evaluate the implications of transport and disposal of SNF and HLW on national security, terrorism, and proliferation of nuclear weapons in the U.S. and abroad. Mechanisms that preclude terrorism and proliferation also should be addressed by the EIS. (6 commentors)
3 (Long-term management of waste)	Two commentors suggested that the EIS consider the management of nuclear waste at Yucca Mountain by future generations. (2 commentors)

Table A.1-1. General Policy (cont.)

Subissue (key words)	Comment Summary
4 (State rights; constitutional basis for disposal in Nevada; exclusive jurisdiction over land)	Several commentors requested that the EIS discuss the Constitutional basis for a federal agency to: (1) take title to nuclear waste generated by private industry, (2) commandeer the natural and governmental resources of the State of Nevada, and (3) affect Nevada's socioeconomic well-being. In addition, commentors wanted the EIS to: justify the selection of Yucca Mountain against the wishes of the State of Nevada; discuss how the DOE intends to acquire exclusive jurisdiction of the Yucca Mountain site considering the Constitutional requirement that exclusive jurisdiction can be acquired only in the manner set forth in Article I, Section 8, Clause 17, of the U.S. Constitution; and discuss how the DOE will acquire the required consent of the Nevada Legislature for exclusive jurisdiction of this land. (6 commentors)
5 (Site suitability)	Commentors requested that the EIS discuss whether, when, and under what conditions the DOE would recommend that Yucca Mountain is an unsuitable site for a repository. One wanted an alternative plan if Yucca Mountain is found to be unsuitable. (3 commentors)
6 (Public confidence in program)	One commentor stated that the EIS should discuss how the nuclear waste program will improve performance of DOE's technical and scientific investigations, and program management to increase scientific legitimacy. Others said the EIS should discuss how public trust and confidence in the nuclear waste program (including public acceptance of health effects from transporting the waste) and DOE's management of the program will be achieved. (3 commentors)

Table A.1-1. General Policy (cont.)

Subissue (key words)	Comment Summary
7 (Funding and legislation)	Commentors suggested that the EIS be deferred until funding issues are resolved, new legislation and standards are approved, and a revised program approach is developed. More specifically, the EIS should consider: (1) how the EIS process and assessment of impacts would be affected because of unfunded or underfunded state and county(ies) activities, (2) alternative funding mechanisms if the Nuclear Waste Trust Fund is depleted, and (3) how the EIS process will respond to legislation requiring siting an interim storage facility, and allowing DOE discretion in route selection and shipping schedules. In addition, these commentors recommended that, until these issues are resolved, DOE should plan on additional scoping meetings or scoping should remain open indefinitely. Commentors also indicated that the resulting implementation plan would be inadequate until these program issues are resolved. (20 commentors)
8 (Regional equity)	Several commentors indicated that the EIS should address the inequities and the "political" and related aspects of the process by which the Yucca Mountain site was elected for study by Congress. Issues raised by the commentors included: (1) siting a repository at Yucca Mountain considering that the original NWPA required selection of a first site west of the Mississippi River and a second site east of the Mississippi River, (2) the validity of the NWPA given that the state was viewed as politically weak and that comparative evaluations among sites are not possible, (3) the lack of funding for Nevada's Nuclear Waste Project Office, because the Office is finding scientific problems with the Yucca Mountain site, (4) the perspective that the site is not likely to be found unsuitable because of the large amount of money already spent, and as problems are found at Yucca Mountain the siting guidelines will be revised, and (5) queries as to what other areas/sites have been examined for waste storage. (9 commentors)

Table A.1-1. General Policy (cont.)

Subissue (key words)	Comment Summary
9 (Supplemental EISs; ecosystem management)	A commentor recommended that the results of ecosystem-based studies on the long-term consequences of the repository to future generations be included in the EIS. The commentor further stated that if DOE's NEPA schedule is too short to include the results of these studies, then the implementation plan should describe how this information will be obtained and presented in supplemental EISs. (1 commentor)
10 (Baseline conditions)	Three commentors stated that the description of baseline conditions described in the EIS should be those conditions that existed prior to the start of site characterization. (3 commentors)
11 (Retrievability)	Two commentors stated that the waste should be retrievable in the future, because it may be valuable and because future technological advances may solve the disposal problem. (2 commentors)
12 (Site characterization equated to repository construction)	Three commentors believe that the EIS should address construction of the exploratory shaft facilities as a de facto repository, although the suitability of the site has not been decided. (3 commentors)
13 (Independent review of nuclear policy)	Several commentors requested the preparation of a programmatic EIS that would evaluate the Nation's nuclear waste policy, possibly including an independent review process. EISs for related program elements would be tiered to the programmatic EIS. The programmatic EIS should include: an evaluation of major siting decisions involving co-location of both defense and non-defense storage and disposal facilities in Nevada; transport of waste, including accidental releases and incremental exposure to radiation at communities along waste-transport routes; and the impacts of nuclear power plants. (175 commentors)

Table A.1-1. General Policy (cont.)

Subissue (key words)	Comment Summary
14 (Shipping taxes)	One commentor stated that the EIS should evaluate the feasibility of taxing each shipment of SNF or HLW at the county or state level. (1 commentor)
15 (Release standards)	A commentor questioned the use of the release standards, noting that assurance of long-term isolation of radionuclides from the human environment is not achievable, because existing and proposed radiation-release standards allow for some radiation to escape from the repository. (1 commentor)
16 (Utility responsibilities)	One commentor stated that the companies that build and operate nuclear power plants should be responsible for waste disposal. (1 commentor)

Table A.1-2. DOE NEPA Policy

Subissue (key words)	Comment Summary
1 (EIS content)	Commentors said that the EIS should include a detailed description of all affected environments and impacts to those environments. More specifically, the analyses should include: (1) worst-case and mile-by-mile assessments of potential impacts along transportation routes and the emergency-response measures along these routes; (2) the effects *of* the environment *on* the safety of waste shipments, including a discussion of the controversial nature of waste transport; (3) retrievability of the waste, along with the disposition of the retrieved waste; (4) the economic, social, health, and psychological costs of transporting and storing the waste, including the costs of accidents; (5) negative effects on property values, businesses, and tourism near the site and along transportation routes; and (6) risk, risk perception, and stigmatization. One commentor requested that the EIS discuss the ethics of no action, including the eventual shutdown of the nuclear industry, increased consumption of fossil fuels, impacts to the U.S. economy from diminished supplies of electricity, and State rights versus the good of the nation. Other commentors said Yucca Mountain should be discussed as a national sacrifice zone, the EIS should not be schedule driven, assumptions concerning expected levels of program funding should be discussed, and the EIS must assess all subjects mentioned in Title V of the NWPA. (21 commentors)
2 (Site suitability; licensing)	Several commentors said the EIS should focus on the technical aspects of site suitability and the license to operate the repository (e.g., demonstrate that the proposed action and alternatives meet the licensing criteria in 10 CFR 960, collect EIS data pursuant to quality assurance criteria similar to those used for licensing). Some commentors were concerned that the 5-year schedule for the EIS was too short considering its relationship to site suitability and licensing, whereas other commentors believed that the schedule was too long. (5 commentors)

Table A.1.-2. DOE NEPA Policy (cont.)

Subissue (key words)	Comment Summary
3 (Uncertainty)	Several commentors addressed the issue of technical and programmatic uncertainty requesting that the EIS examine the uncertainty of long-term storage; changing laws, political support, and funding (e.g., funding reductions for site characterization and the intent of some in Congress to limit site suitability studies); changing attitudes and values regarding waste disposal; uncertain repository performance; and uncertain data. (3 commentors)
4 (Issue analysis)	Several commentors provided "broad" or general recommendations as to how the EIS process and document preparation should proceed. One said that the EIS should be organized by *issues*, rather than a traditional organization by subjects (air quality, geology, etc.), and rely on stand-alone technical reports for each issue. Another requested that the implementation plan include a list of decisions that the EIS needs to support, along with a discussion of the factors that DOE will use to make comparisons among all decision choices. Other commentors requested that the EIS be part of a comprehensive risk-management process (independently prepared and acceptable to stakeholders), and reflect scoping comments from the NTS sitewide EIS and the Multi-Purpose Canister EIS, and that all commitments for mitigation be included in the Record of Decison. (6 commentors)
5 (Past DOE activities in southern Nevada)	Several commentors requested that the EIS reveal and otherwise evaluate the effect of past DOE activities in southern Nevada. More specifically, commentors requested: (1) a history of decisions by DOE (and DOE predecessors Energy Research and Development Administration and the Atomic Energy Commission) that have affected the health and safety of organisms within a 700-mile radius of Yucca Mountain, (2) a summary of research conducted on the effects on health and safety from radiation exposure, (3) a list and summary of past and pending litigation on radiation exposure, (4) that the EIS examine the global risks from nuclear-related activities, and environmental restoration and waste management at the NTS, including the transportation of wastes, and (5) that the repository EIS be coordinated with the EIS on the NTS. (3 commentors)

Table A.1.-2. DOE NEPA Policy (cont.)

Subissue (key words)	Comment Summary
6 (Site characterization program)	Commentors were concerned that the EIS would be based on preliminary information with high uncertainties (site characterization incomplete, reliance on computer modeling), and on preliminary test results (thermal-load testing not mature). (4 commentors)

Table A.1-3. Other EISs

Subissue (key words)	Comment Summary
1 (Other EISs)	Commentors said that the public and Native American Tribes had not been well informed about potential activities presented in several DOE EISs including: the Foreign Research Reactor, Multi-Purpose Canister, Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratories, Programmatic Waste Management, Nuclear Weapons Nonproliferation Policy, Transfer and Disposition of Surplus Highly-Enriched Uranium, Fissile Materials, Uranium Supply and Recycling, and Stockpile Stewardship EISs. (4 commentors)

Table A.1-4. Perception-based Impacts

Subissue (key words)	Comment Summary
1 (Perceived risk analysis)	Commentors believe that the EIS should address perceived risks (stigma, psychological, sociological, community behavior, cultural, spiritual) due to the negative impression of a repository, other related effects (transportation gridlock), and the potential resulting economic losses from the construction and operation (routine, accidents, sabotage) of the repository, when considered on a national basis (San Luis Obispo), and on a local (nearby the site, Clark County) and regional basis (transport corridors). Mitigation measures (compensation from loss of tourism and business and decreasing property values, creation of insurance programs, compensation distribution plans, purchase of private property, business and personal relocation) to offset perceived risks also should be addressed by the EIS (in part, based on *City of Santa Fe vs. Komis*). More specifically, the EIS should evaluate and mitigate the real and perceived risks for each affected community (including Native American communities) and social/cultural groups or organizations, on: socioeconomics, tourism and recreation (visitor/entertainment sector, gaming, conventions/meetings business, commercial activity), retirement and quality of life, county and community property values, local emergency management capabilities and effectiveness, tax base, ability to maintain community services, and the democratic way of life. (43 commentors)
2 (Perceived risk and route selection)	Commentors believe that the EIS should be used to select specific transportation routes in consideration of the socioeconomics impacts from the public perception of risks. Socioeconomic impacts mentioned for analysis include interference with orderly and planned urban development, and unredeemable costs and burdens on local governments. (2 commentors)

Table A.1-5. Legal

Subissue (key words)	Comment Summary
1 (Ruby Valley Treaty; other treaties; Western Shoshone Indians)	Commentors requested that the EIS identify and consider all relevant legal issues. These commentors asserted that Yucca Mountain and surrounding lands belong to the Western Shoshone Nation, according to the 1863 Treaty of Ruby Valley, and that all legal issues involving Indian land claims have not been resolved. The EIS should examine: (1) the legality (based on the 1787 Northwest Ordinance, the 1848 Geneva Convention, the 1848 Treaty of Guadalupe, the 1861 Act to Organize the Territory of Nevada, and Articles 3 and 6 of the Constitution of the United States), (2) land disturbances for construction of rail lines, and (3) the impacts to negotiations on land claims of the proposed action (including transportation) in light of the Ruby Valley Treaty and international law. (30 commentors)
2 (Liability issues)	Several commentors requested that the EIS clarify the extent and longevity of responsibility and liability for impacts associated with the disposal of nuclear waste, and for accidents along transport routes from points of origin to Yucca Mountain. Another requested the name of all elected and appointed individuals that have responsibilities and liabilities with regard to the Yucca Mountain Project, as well as agencies involved in the decision-making process. (179 commentors)
3 (Failed standards; site disqualification)	A few commentors indicated a variety of concerns relevant to the analyses in the EIS, citing the failures by Environmental Protection Agency to set rigorous radiation-release standards based on Section 801 of the 1982 Energy Policy Act, and the failure to faithfully apply the scientific method, because Yucca Mountain would have been disqualified. (4 commentors)

Table A.1-5. Legal (cont.)

Subissue (key words)	Comment Summary
4 (Solving nuclear waste problems)	Two commentors discussed a 5-step process for solving the nuclear-waste issue: (1) impose a moratorium on all shipments of nuclear waste; (2) establish a commission on nuclear waste; (3) pursue conservation and renewable energy sources and phase out nuclear energy; (4) establish a national nuclear-waste policy that respects the sovereignty of states, counties, and tribes; and (5) pursue an aggressive policy of nuclear-weapons disarmament. (2 commentors)
5 (Port of military waste receipt)	Two commentors asked if the public would be aware of the import locations of military waste bound for the repository. (2 commentors)

Table A.2-1. Scoping Process

Subissue (key words)	Comment Summary
1 (Number and location of meetings)	Commentors requested that DOE hold meetings in communities within all states and counties through which SNF and HLW will be transported, asserting that without which, the public's right to comment is compromised. Commentors also requested that additional scoping meetings be held in Nevada (e.g., Elko, Eureka, Ely, Amargosa Valley), in various other identified communities (e.g., Belen, New Mexico), and in affected Indian communities. Others expressed concern that Yucca Mountain Project scoping meetings were scheduled coincident with other Departmental meetings thereby minimizing public input into the scoping process. These commentors suggested that a formal policy be institutionalized requiring meetings to first be cleared with the hosting site. One commentor noted that scoping meetings should not be held on the Jewish Sabbath. (190 commentors)
2 (Draft EIS hearings)	Several commentors requested that DOE hold public hearings on the draft EIS in their particular communities. Commentors also requested a 90-day public comment period on the draft EIS. (5 commentors)

Table A.2-1. Scoping Process (cont.)

Subissue (key words)	Comment Summary
3 (Meeting logistics and forums)	Commentors requested that the scoping process (i.e., meetings, written comments) be restructured to develop a broad-based public consensus process. Some commentors requested that: (1) the scoping period be extended (2 months), (2) the public participate in the identification of impacts, (3) they be allowed to provide pre-decisional input, and (4) the EIS include interviews with Nevada residents previously exposed to radiation. Other options to the scoping meeting format used by DOE were suggested that would allow for: (1) round-table panel discussions; (2) the formation of citizen advisory boards in reactor communities; (3) a shortened introduction, without the use of visual aids, by the DOE speaker; (4) the use of personal recording devices; (5) question and answer sessions exclusively; (6) no limitations on the number of speakers; (7) the elimination of "biased" materials presented by DOE, and improved answers to audience questions; and (8) relocating the microphone to enable speakers to address the audience. One commentor requested written acknowledgment that comments were received by DOE. Some commentors found that parking facilities were inadequate, that meeting rooms were difficult to locate, and that e-mail did not work properly, all of which act as a deterrent to public participation. (27 commentors)
4 (Adequacy of notice)	Commentors indicated that insufficient notice and inadequate information (no detailed maps, little information detail, poor description of proposed action) were received by communities and individuals located along potential transportation routes. Others suggested that DOE should: (1) contact every affected tribal government by means that will ensure receipt of information, (2) provide public service announcements on the front page of newspapers, (3) provide announcements to the television media, and (4) provide greater detail and information regarding the proposed action and aspects of transportation. (23 commentors)

Table A.2-1. Scoping Process (cont.)

Subissue (key words)	Comment Summary
5 (Effective participation)	Commentors requested that DOE develop and implement a process that would maximize public involvement during finalization of the alternatives and preparation of the EIS and the Record of Decision. DOE should also provide a means to inform and educate the public of the risks and consequences of developing the repository. This process could be facilitated by developing "citizen advisory boards around transport communities" or public citizen's action committees. Other commentors requested that DOE "seriously" consider all comments provided. (186 commentors)

Table A.2-2. Implementation Plan

Subissue (key words)	Comment Summary
1 (Implementation plan)	Many commentors requested that DOE complete the Implementation Plan soon after closure of the scoping period, and that DOE provide a draft Implementation Plan for further review and comment by the public (both as a written document and from additional public meetings). Some commentors requested that the Implementation Plan provide a "comprehensive road map" describing how the EIS will support decisionmaking. Others requested that the Implementation Plan provide a demonstration of the necessary methodology, scientific accuracy, and professional integrity needed to develop the EIS, possibly by involving the Council on Environmental Quality and/or independent peer review. One commentor noted that the Implementation Plan should discuss how DOE will address the inevitable changes in programmatic assumptions and parameters. One commentor suggested that DOE provide the comments from scoping to the affected state agencies, and another requested the comments be sent to DOE's Bartlesville Research Facility. (11 commentors)

Table A.2-3. Consultations

Subissue (key words)	Comment Summary
1 (Use of county data and information)	Several commentors suggested that the EIS incorporate data and information available from potentially affected counties and communities within the state of Nevada. The range of data and information cited by these commentors include, but is not limited to, databases on geotechnical features, socioeconomic conditions, geographic information system capabilities, emergency preparedness inventory and analysis, rail corridor route analyses, infrastructure damage assessments, regional hydrology studies, ethnographic studies, and rest area needs and impact analysis. (9 commentors)
2 (Native American consultation)	Commentors, representing Native Americans, requested more formal involvement in the overall NEPA process to ensure that tribal rights and concerns are considered prior to decisionmaking or Departmental action. Many commentors cited: (1) the DOE's Indian policy regarding government-to-government relations, (2) tribal sovereign rights to regulate tribal lands and resources, and (3) cultural resource laws (National Historic Preservation Act, Native American Graves Protection and Repatriation Act, Archaeological Resources and Protection Act) as appropriate justification for greater involvement. Specific involvement issues raised included routing decisions and transportation planning, development of alternatives, impacts to ancestral artifacts, ecosystem impacts, the development of a plan to ensure Native American review of the draft EIS, and financial assistance for consultation purposes. (22 commentors)
3 (Other agencies)	Some commentors requested cooperating agency status for their respective organizations, based upon unique skills, expertise, knowledge, and data. One commentor requested that Council on Environmental Quality, Environmental Protection Agency, Nuclear Regulatory Commission, Department of Transportation, Federal Emergency Management Agency, and Department of the Navy be actively involved (cooperating agency or consultation) in the preparation of the EIS. One commentor noted that the Implementation Plan should address how Nuclear Regulatory Commission's NEPA policy and guidance will be addressed. (6 commentors)

Table A.2-4. Record of Decision

Subissue (key words)	Comment Summary
1 (Record of Decision)	Commentors requested that the Implementation Plan provide a description of the contents of the Record of Decision. Commentors also requested that the Record of Decison include: (1) how, and by whom, costs for emergency preparedness and response along transportation routes will be paid; (2) mitigation measures that were adopted to avoid or minimize impacts, rectify concerns or conflicts, and compensate affected parties for unavoidable consequences; (3) mitigation measures that were not adopted and the reasons why; (4) the basis for the decision, and (5) an explanation of alternatives considered and the identification of the environmentally preferable alternative. (8 commentors)

Table A.2-5. Impact Analysis Process

Subissue (key words)	Comment Summary
1 (Impact analysis process)	In general, commentors recommended that the EIS address general policy issues relevant to the NEPA process, management of that process, and impacts due to site characterization activities at the Yucca Mountain site. The EIS must present a thorough description of the natural, social, economic, and as-built aspects of the project that are sufficient to enable delineation of subarea (i.e., specific community) impacts (including probability of occurrence and degree of consequence). Commentors indicated that preparation of the EIS required the development of a structure (or plan) for data collection, analysis, and research that is comprehensive, and relies on related project activities. Sufficient data should be collected so as to minimize, if not avoid, uncertainties and, thus, the 5-year time frame allotted for completion of the EIS should not be a requirement, but rather a guideline. This requires an interdisciplinary approach to: (1) acquire empirical baseline information; (2) acquire empirical information about potential adverse impacts; (3) reduce uncertainties through risk analysis; and (4) develop adequate plans for monitoring, managing and mitigating potential impacts for up to 1 million years. Commentors suggested that the extent of uncertainty must be identified in the EIS. It was further suggested that a "holistic [and ecosystem] approach that analyzes the entire system around waste disposal" is appropriate to ensure environmental decisionmaking in the long-term context of the repository. These same commentors believe that the NEPA process, based on DOE's commitment to comply with the spirit and intent of NEPA, should provide a link between the affected public and federal resource management policy. Based on historical and current ecosystem project activities, commentors requested that the EIS describe the role and use of the data and information resulting from these activities. In addition, the EIS should not rely on subjective judgment, but must include empirically-based findings, and explain how its ongoing environmental program will compensate for the lack of process-based ecosystem simulation modeling. Some commentors suggested that the EIS include the views of those scientists and engineers that oppose the project, and that independent peer review was necessary to prepare an adequate EIS. (6 commentors)

Table A.3. Alternatives

Subissue (key words)	Comment Summary
1 (Phase and activity alternatives)	Commentors requested that alternatives in the EIS address all phases (e.g., construction, transportation, operation, retrieval, closure) and major activities (e.g., emplacement, construction methods, backfill, ownership and management of transportation systems, maintenance). Some commentors suggested that alternatives be developed based on reducing exposure risk and uncertainty, increasing safety, and enhancing economic benefit. (156 commentors)
2 (Alternative descriptions)	Commentors requested that the EIS justify the selection of the alternatives, and that the alternatives and options be sufficiently defined to comprehensively describe the affected environment, and to allow an equivalent analysis (between alternatives) of potential positive and negative impacts to human health and the environment (e.g., groundwater, air, socioeconomics) from routine operations and accidents during construction, operation, and closure. The types of detail identified include: (1) shipping priorities, (2) shipping facilities to be used, (3) the maximum number of shipments by mode, (4) the routes and their attributes (e.g., population centers), (5) construction methods, (6) facilities used at Yucca Mountain, (7) subsurface attributes that ensure that SNF and HLW can be contained, (8) surface and subsurface operations (e.g., handling, packaging, emplacement, secondary waste handling, mitigations), (9) anticipated waste package characteristics (e.g., fuel age, heat, size), (10) retrieval scenarios, (11) agency responsibilities for transportation and accident/emergency response, (12) pre- and post-closure monitoring programs, and (13) institutional controls. (63 commentors)
3 (Other alternatives)	Commentors requested that the EIS include other alternatives such as mixed thermal loads, an isothermal-distributed load, only the high thermal load with an incremental evaluation of performance, and a retrievable-waste alternative. (10 commentors)

Table A.3. Alternatives (cont.)

Subissue (key words)	Comment Summary
4 (Alternative transportation options)	Commentors requested that other/additional transportation routes or alternative modes be evaluated in the EIS: (1) regional corridors through Nellis Range and Goldfield vicinity, (2) other modes (e.g., aircraft, rapid transport/dedicated rail), (3) other mixes of national truck and rail modes (e.g., 50:50, 60:40), and (4) limited use of truck shipments. (8 commentors)
5 (Repository capacity)	Several commentors requested that the alternatives include the management of all SNF and HLW or more than 70,000 MTHM of HLW and SNF by: (1) evaluating larger repository capacities (e.g., maximum amount of repository capacity, 120-140,000 MTHM), (2) describing the need for and impacts of a second repository, and (3) describing how the entire foreseeable HLW and SNF inventory would be managed (e.g., treatment and storage alternatives). (16 commentors)
6 (Waste acceptance)	Commentors requested that the EIS identify all waste (and waste characteristics) to be disposed of in the proposed repository. Examples of waste types that should be discussed (for disposal or in confirmation that they would not be disposed) included all waste types in other DOE EISs and DOE planning documents proposed for geologic disposal, Greater than Class C, special case, weapons-grade plutonium, highly enriched and Navy SNF, and West Valley SNF and HLW. Characteristics that commentors stated were important for the EIS to discuss included fuel type, age, structural characteristics, cladding, and volume of each source of SNF and HLW. Two commentors requested that the EIS identify the order in which the producers/generators would ship SNF and HLW to the repository. One commentor stated that DOE SNF (including Navy SNF) should be received early. (26 commentors)

Table A.3. Alternatives (cont.)

Subissue (key words)	Comment Summary
7 (Identify preferred alternative)	Three commentors requested that the preferred alternative and options be identified in the draft EIS. (3 commentors)
8 (Additional packaging options)	Commentors requested that additional packaging options be described and evaluated in the EIS. Additional options included: (1) different materials to construct waste packages, (2) legal-weight truck Multi-Purpose Canisters, and (3) different package designs. One commentor wanted the description of the packaging options to indicate that As Low As Reasonably Achievable principles would allow some radiation to be emitted from packages. (11 commentors)
9 (Scope of activities to be included in action alternatives)	The Action Alternatives should include (or not include) other activities besides the construction, operation (including transportation), and closure of the repository. Other activities included: (1) impacts of construction of shipping containers and waste packages, (2) infrastructure development, (3) future construction and operation of new and existing power plants, (4) additional SNF and HLW generation because on-site storage space will become available, (5) global activities associated with foreign research reactor SNF transfer, and (6) no longer generating SNF as part of the action alternatives. One commentor stated that future operation of new and existing reactors and construction of new reactors should not be part of the action alternatives. (12 commentors)

Table A.3. Alternatives (cont.)

Subissue (key words)	Comment Summary
10 (No action description)	The No Action Alternative should include activities in addition to stopping work at Yucca Mountain and continued storage of SNF and HLW at the generator sites. Other activities to be evaluated include: (1) long-term storage and maintenance of SNF and HLW (also Greater than Class C), (2) the development and use of dry cask storage, (3) phase-out and replacement of nuclear power with alternative sources, (4) all SNF and HLW (not limited to 70,000 MTHM), and (5) site-specific activities (e.g., closure dates, handling options, on-site storage, SNF/HLW inventory). Several commentors stated that the No Action Alternative should not include discussions of the future of the nuclear energy industry, including future construction and operation. Some commentors stated that the No Action Alternative must be part of the EIS, while other commentors stated that the No Action Alternative should not be part of the EIS because it was not part of Congress's intent. One commentor stated that the No Action Alternative should be the only alternative evaluated in the EIS. (45 commentors)
11 (Options to geologic disposal)	Commentors requested that alternatives to geologic disposal be evaluated in the EIS. Suggested alternatives included interim storage (at Yucca Mountain or unspecified locations), reprocessing, seabed disposal, space disposal, waste treatment (e.g., annihilation reduction, brown gas, modular helium reactor use), and long-term temporary storage until treatment technologies could be developed. Several commentors suggested that alternative sites (e.g., Canada) be considered in the EIS. Others requested additional actions by DOE beyond preparing a Repository EIS (e.g., prepare separate transportation EISs and establish independent commission to review entire waste management and SNF program). (42 commentors)

Table A.4. Schedule and Licensing

Subissue (key words)	Comment Summary
1 (Timing of scoping and licensing)	One commentor asked whether the DOE's schedule for submitting a license application to the Nuclear Regulatory Commission in 2001 (as described in the DOE's *program approach*) is the reason for holding EIS scoping hearings in 1995. (1 commentor)
2 (Schedule for disposal operations)	Four commentors were concerned about the schedule for opening a repository at Yucca Mountain. Three noted that DOE has a responsibility to start accepting waste shipments at the repository in 1998, but that 2010 is now the best that can be done. The other requested that the amount of time between scoping and licensing be explained. (4 commentors)

Table A.5. Land Use

Subissue (key words)	Comment Summary
1 (General land use)	Commentors requested that the EIS examine the effects of construction and operation of the repository and its transportation systems on federal, state, and county existing land uses (e.g., land quality, agriculture, livestock use, mineral/oil exploration, protected or otherwise sensitive lands, withdrawn areas, availability of water resources) and land use plans, policies, and controls. (7 commentors)
2 (DOE land-use policy)	One commentor requested that the EIS discuss how the repository program will be consistent with DOE's Land Facility Use Management Policy on ecosystem management, sustainable development, and stakeholder participation in decision-making. The commentor also requested an explanation of how the Yucca Mountain Project will be consistent with the Resource Management Plan being developed for the NTS and how DOE (NTS and the Yucca Mountain Project) will interface with the Bureau of Land Management's Mojave-Southern Great Basin Regional Advisory Council, as well as take into account the rangeland health standards and guidelines. Another commentor stated that the EIS must address any conflicts between DOE's proposed action and the plans, policies, and controls of Indian Tribes. (4 commentors)
3 (Regional transportation)	Commentors suggested that the EIS evaluate the impacts to current land uses along the potential regional rail and heavy-haul routes. Land uses and related issues identified for evaluation include: (1) the availability of public lands, (2) the ease of obtaining rights-of-way, (3) consideration of eminent domain, (4) impacts to hunting and fishing opportunities and other recreational water uses, (5) effects on grazing allotments and livestock permittees, (6) public travel across Big Smokey Valley, and (7) potential interference with U.S. Air Force operations on the Nellis Bombing and Gunnery Range. (143 commentors)

Table A.5. Land Use (cont.)

Subissue (key words)	Comment Summary
4 (Cleanup of transport accidents)	One commentor requested that the EIS indicate whether all lands would be cleaned up to the same standards after an accident, regardless of ownership. (1 commentor)
5 (Lack of private lands near towns)	One commentor believed that the EIS should consider the extent to which communities near the repository would grow rapidly and the resulting impacts from increased demands on the use of limited private lands for residential, commercial, and industrial development. (1 commentor)

Table A.6. Air Quality and Meteorology

Subissue (key words)	Comment Summary
1 (Air quality and meteorology)	Several commentors noted that construction and operation of the repository and transportation facilities could degrade current air-quality attainment status (Lincoln and Clark Counties), and that emissions of fugitive dust could impair visibility and reduce the safety of waste transport. Thus, the EIS should describe existing air-quality and meteorological conditions (severity of storms, temperature extremes, fog) in each affected area, and assess the potential environmental consequences to air quality and the extent to which meteorological conditions could affect waste transport. (6 commentors)
2 (Airborne exposures)	One commentor noted that the radiation risk to residents (Esmeralda County) of airborne exposure should be included in the EIS. (1 commentor)

Table A.7. Geology

Subissue (key words)	Comment Summary
1 (Rock characteristics)	Three commentors stated that the subsurface rock at Yucca Mountain is rotten (crumbles easily during tunneling), or has been fractured from underground testing of nuclear weapons, and that radioactive releases into this rock must to be evaluated. (3 commentors)
2 (Soils)	One commentor requested that the EIS evaluate the potential for spills to penetrate into the ground. (1 commentor)

Table A.7. Geology (cont.)

Subissue (key words)	Comment Summary
3 (Earthquakes; structure; volcanism)	Many commentors asked that the EIS evaluate the impacts of seismicity, geologic structure, and volcanism on radionuclide containment and repository operations. Issues raised for consideration included: (1) the proximity of Yucca Mountain to the Walker Lane/Las Vegas Shear Zone, (2) the relationship between the Walker Lake/Las Vegas Shear Zone and the San Andreas fault, (3) the pattern of earthquakes and volcanism in the region, (4) the classification of the region as a high earthquake-hazard zone, (5) and active plate tectonics. Several commentors stated that the faults at Yucca Mountain need additional study for inclusion in the EIS, because they are pathways (through rupture or breach) for gases and fluids to enter and exit the repository and transport radionuclides. Some commentors questioned the reliability of predicting the size and location of earthquakes, and the accuracy and recency of geologic mapping in the region. Others wanted a detailed description of the seismic design of the facility, and an evaluation of the consequences from the largest credible earthquake, including changes in the water table. One commentor noted that large volcanic eruptions have covered Yucca Mountain and asked that the EIS examine the likelihood of similar eruptions in the future. (42 commentors)
4 (Subsidence)	One commentor asked if the EIS will discuss monitoring of potential subsidence at the surface caused by underground excavations, and if numerical modeling of underground stresses will be conducted. (1 commentor)

Table A.7. Geology (cont.)

Subissue (key words)	Comment Summary
5 (Paleontology)	One commentor requested that the EIS identify paleontologic sites in Lincoln County that could be impacted by construction of the repository and the rail line. (1 commentor)
6 (Mineral resources)	Two commentors requested that the EIS assess the impacts to mineral exploration and development from the withdrawal of lands for the repository. Another commentor requested that the EIS identify sites in Lincoln County for borrow material (chiefly for the railbed) and include geologic and soil maps for all potentially impacted areas in Lincoln County. (3 commentors)

Table A.8. Hydrology

Subissue (key words)	Comment Summary
1 (Tritium)	Commentors believed that the EIS should evaluate the source and significance (in terms of flow and transport) of tritium found below the repository horizon. One stated that the source of the tritium must be determined before the program proceeds. The other said the tritium is due to above-ground testing of nuclear weapons conducted from the late 1940s to the mid 1960s, and that the presence of tritium indicates that it has traveled rapidly through the groundwater system from testing areas. This should disqualify the site because the siting guidelines (10 CFR 960) state that "A site shall be disqualified if the pre-waste groundwater travel time along the fastest pathway is determined to be less than 1000 years." (2 commentors)
2 (Calcite along fractures)	Commentors requested that the EIS evaluate the impacts from reasonable changes in the level, and the potential for elevated temperatures, of the water table at Yucca Mountain. To support this issue, commentors cited the presence of "calcite opal mineral formations" along fractures as evidence of upwelling hot water, which could leach radionuclides into the environment, flash to corrosive steam in an already hot repository, and increase the risks of criticality. Another commentor noted the high temperature of the Amargosa River as evidence of high-temperature groundwater. (4 commentors)
3 (Water quality and quantity)	Commentors stated that the EIS must fully describe the existing environment (wells, springs, drinking and agricultural water sources including the Humboldt River, depth to groundwater, water quantity and quality, spring-discharge rates), and examine possible impacts to these resources from construction and operation of regional transportation facilities and the repository, including impacts from repository failure. The region of influence evaluated by the EIS should include all parts of southern Nevada and eastern California within the groundwater-flow system that contains Yucca Mountain, as well as the areas along potential regional transport routes. (15 commentors)

Table A.8. Hydrology (cont.)

Subissue (key words)	Comment Summary
4 (Surface flooding)	One commentor stated that the impacts of surface flooding during construction and operation of the repository should be evaluated. (1 commentor)
5 (Water quality and protected lands)	Commentors requested that the EIS conduct additional studies of the deep aquifer system, and evaluate the pathways created by faults at and near Yucca Mountain that could allow surface water to seep through the repository and adversely affect groundwater in Amargosa Valley, Ash Meadows, and Death Valley National Park. (5 commentors)
6 (Water rights for repository)	One commentor stated that the EIS should describe the relevant state of Nevada water rights regulations and whether DOE is in compliance. (1 commentor)
7 (Pre- and post-closure monitoring)	A commentor indicated that the EIS should provide the technical basis to establish a groundwater-monitoring network during the pre- and post-closure phases of the repository, believing that groundwater quality, quantity, and flow in the saturated and unsaturated zones at Yucca Mountain will not be adequately known. (1 commentor)

Table A.9. Biology

Subissue (key words)	Comment Summary
1 (Impacts to biological resources)	Commentors stated that the EIS, based on field surveys prior to further ground disturbance, should thoroughly examine the impacts to biological/natural resources during all phases of repository development. Commentors suggested that the analyses address: (1) critical habitats for threatened, endangered, and sensitive species, including impacts from radiation exposure during accident-free operations and from accidents, (2) impacts to wildlife habitat and migration (wild horses, bald eagles), and big game populations along transport corridors/corridor improvements/borrow areas (Big Smoky Valley, Lincoln County, Clark County, Elko region) and the loss of hunter-generated revenue, and (3) cumulative impacts considering both (1) and (2). (160 commentors)
2 (Heat-induced impacts)	One commentor requested that the nature and duration of changes in the surface ecosystem at Yucca Mountain from waste-generated heat and refluxing water vapor be examined in the EIS for each alternative. (1 commentor)
3 (National impacts from waste transport)	One commentor called for the EIS to examine, in consultation with affected Federal and State land-management agencies, the effects on wildlife, wilderness, and public-recreation areas from construction and operation of national and regional waste-transportation corridors. (1 commentor)

Table A.10. Public Health and Safety

Subissue (key words)	Comment Summary
1 (General)	Commentors believed that the repository EIS should address public health and safety issues including, - baseline and future health assessments - past exposures to radiation - dangers of radiation - releases of radioactivity - exposure pathways and scenarios - effects of radiation on Native Americans - agriculture - human error - nuclear proliferation. (570 commentors)

Table A.11-1. General Transportation

Subissue (key words)	Comment Summary
1 (General)	Commentors were generally concerned that the EIS address various aspects of transportation, such as: - cost - prenotification requirements - insurance - comprehensive analysis of impacts - credible scenarios and alternatives - environmental effects - effects on infrastructure - planning - cask testing - safety - security - emergency response - routing - historical and future shipments - impacts on Native Americans - compliance with regulations - identification of assumptions. (50 commentors)

Table A.11-2. Transportation Routing

Subissue (key words)	Comment Summary
1 (Mile-by-mile)	Commentors stated that a route-specific or mile-by-mile assessment of transportation routes and impacts should be performed. Areas to be addressed in the assessment should include radiation doses, accident risks and consequences, emergency response, emergency preparedness, mitigation, and infrastructure. Other commentors stated that a mile-by-mile assessment was not necessary. (211 commentors)
2 (Present routes)	Commentors stated that typical or probable transportation routes should be presented in the EIS. (25 commentors)
3 (DOT vs. alternate routes)	Commentors stated that the statutory authority for routing and the responsibilities of each level of government be identified in the EIS. Further, potential state designated routes or alternative routes should be considered in the EIS, as well as U.S. Department of Transportation routes (considering exposure risks and local economic benefit). Other commentors requested that the DOE develop a routing policy (based on factors such as emergency response, population, accident rates, weather, seasonal road closures, and infrastructure), and some stated that the carriers not be allowed to select routes unilaterally. (24 commentors)
4 (Corridor impacts)	Commentors stated that impacts should be presented for areas and along routes where many shipments occur, and that for each, the total population at risk, the potential radiation doses, health impacts, or the number of shipments should be presented in the EIS. (11 commentors)

Table A.11-2. Transportation Routing (cont.)

Subissue (key words)	Comment Summary
5 (Modes)	Commentors stated that options for transport modes, rail service, or heavy haul roadways should be evaluated in the EIS. (18 commentors)
6 (General)	Many commentors were generally concerned about transportation. Specific comments/concerns relevant to the EIS included: - areas in their communities to be avoided - advance notification of shipments - local control of routing and time of day restrictions - avoiding their community - providing impact analyses for their community - presence of Native American populations along routes - objections to truck or rail routes - property values along routes. (22 commentors)

Table A.11-3. Transportation Accidents

Subissue (key words)	Comment Summary
1 (Water)	Commentors stated that the EIS should evaluate the impacts to groundwater and surface water, and to game habitat and protected species from potential transportation accidents. (6 commentors)
2 (Full range)	Commentors stated that a full range of transportation accidents, especially low probability/high consequence accidents should be evaluated in the EIS. Other commentors stated that the EIS should evaluate a severe, but credible, transportation accident. Some commentors offered specific transportation accidents for analysis. (44 commentors)
3 (Terrorism)	Commentors stated that the impacts from sabotage or terrorist attacks should be evaluated in the EIS. (216 commentors)
4 (Credit for containers)	Commentors stated that the EIS should consider U.S. Nuclear Regulatory Commission requirements for shipping containers in the transportation accident analyses in the EIS. (7 commentors)
5 (General)	Commentors stated that they were concerned about transportation accidents, while others were not concerned about transportation accidents. One commentor requested that the EIS update the data base used for the analyses. (28 commentors)
6 (Economics)	Commentors stated that the EIS should evaluate the economic impacts of transportation accidents. (5 commentors)

Table A.11-4. Transportation Human Health

Subissue (key words)	Comment Summary
1 (Impacts)	Commentors stated that radiological and nonradiological impacts from transporting SNF and HLW should be evaluated in the EIS, for both workers and members of the public (including people along the route and people sharing the route). Cumulative health impacts and shipment of multi-purpose canisters also should be evaluated. (17 commentors)
2 (Increased risk)	Commentors stated that some areas may be exposed to greater levels of risk than comparable areas in the U.S. and these increased risks should be accounted for in the EIS. (5 commentors)
3 (General)	Commentors were generally concerned about transportation accidents or exposures. Other commentors stated that the risks from transportation would be low. (21 commentors)
4 (Methods)	Commentors asked questions about the methods or data to be used in the transportation assessments in the EIS. The use of "comprehensive risk assessment" was advocated by some commentors. Other commentors advocated a comprehensive systems analysis or a traffic impact analysis. Commentors also stated that the EIS should rely upon previously published studies when possible. (11 commentors)

Table A.11-5. Transportation Emergency Response

Subissue (key words)	Comment Summary
1 (General emergency response)	Commentors stated that the EIS should consider emergency response capabilities, training, and needs. Other commentors stated that emergency response problems unique to rural areas should be addressed in the EIS. Other commentors had questions about emergency response plans and responsibilities. Commentors also stated that the EIS should evaluate large-scale evacuations. (240 commentors)
2 (Section 180 (c) of NWPA)	Commentors had concerns about the implementation of Section 180(c) of the NWPA. Specific concerns included: - funding - schedule - policy - ongoing training. (10 commentors)

Table A.11-6. Regional Rail and Heavy Haul

Subissue (key words)	Comment Summary
1 (Rail and heavy haul route selection)	Commentors stated that the EIS should select and evaluate rail and heavy haul routes, offering criteria for selection such as: - public concerns - engineering feasibility - impacts of construction and operations - baseline environmental data - cost - rights of way - Native American claims and cultural resources - public health - ease of access - fairness - potential for shared use - grade crossings - infrastructure and track condition - land use - rail construction standards - locations of maintenance and operations facilities, and material source sites - coordination between agencies - ownership and operator issues - anticipated likely use by mode (including dedicated trains). (22 commentors)

Table A.11-6. Regional Rail and Heavy Haul (cont.)

Subissue (key words)	Comment Summary
2 (Specific route recommendations)	Some commentors suggested specific rail or heavy haul routes or intermodal transfer stations, which should or should not be considered by the EIS. (10 commentors)

Table A.11-7. Transportation Packaging

Subissue (key words)	Comment Summary
1 (Containers)	Commentors stated that the EIS should describe the shipping containers or casks to be used for SNF and HLW. The EIS also should discuss which fuels will be transported by which containers. (9 commentors)
2 (Full scale testing)	Commentors stated that full scale cask testing should be performed on the casks analyzed in the EIS. Other commentors stated that full scale cask testing was not necessary. (9 commentors)
3 (Multi-purpose canister)	Commentors stated that the EIS should focus on transport-only casks, not on multi-purpose casks. Other commentors stated that the EIS should focus on the 75-ton multi-purpose cask, not on the 125-ton multi-purpose cask. (3 commentors)
4 (General)	Commentors were generally concerned about shipping containers or casks. Specific comments/concerns that should be addressed by the EIS were: - safety and integrity of containers - deterioration - use of multi-purpose casks - cask construction and testing - lack of containers - heat of the SNF inside the cask. (11 commentors)

Table A.11-7. Transportation Packaging (cont.)

Subissue (key words)	Comment Summary
5 (Bounding)	A commentor stated that the number of shipments used for impacts analysis should be estimated based on single assembly casks, in order to provide an upper bound on the number of shipments. (1 commentor)

Table A.12-1. Cultural and Historic Resources, General

Subissue (key words)	Comment Summary
1 (General)	Commentors requested that the EIS evaluate cultural resources nearby Yucca Mountain and along proposed regional rail/heavy haul corridors (Carlin and Jean routes, in Lincoln and Esmeralda counties, historic Palisade-Eureka route) given the proposal to construct and operate the repository system. More specifically, commentors indicated that the EIS should consider historical and prehistoric sites, paleontologic resources, and Native American land claims and religious freedom issues. Analyses must also be based on Class III field surveys, as well as other forms of research. (7 commentors)

Table A.12-2. Cultural and Historic Resources, Native American Issues

Subissue (key words)	Comment Summary
1 (Previous commitments)	Commentors stressed that the EIS should fulfill commitments made in the 1986 Environmental Assessment relative to "potential for impacts on Native American Cultures" from the construction of the repository and the transportation of SNF and HLW (including ancillary features). The EIS should include an historical description of Native American experiences in the areas affected by the repository program, including the issues of land claims, treaty obligations, federal laws relating to cultural and religious rights of Native Americans, unsettled political and legal issues, and the potential applications of Indian law to repository issues. Impacts that must be assessed, for all Native American communities both in Nevada and nationally, include: - economics (economic structure, direct/indirect employment, spending, public service effects, land use conflicts) - infrastructure - emergency response/preparedness requirements (including the lack of medical facilities) - state/tribal relationship effects that may be caused by state routing or risk management decisions - implications for tribal sovereignty - Native land claim issues and impacts - religious aspects - political activities - Native American relations with other governmental entities (neighboring rural and urban communities, state/local/federal agencies) - quality of life (psychological stress). In addition, the EIS should consider Native American views as to what constitutes an acceptable impact on nature. (147 commentors)

Table A.12-2. Cultural and Historic Resources, Native American Issues (cont.)

Subissue (key words)	Comment Summary
2 (Government relations)	Commentors called for the EIS to act as a forum to enable DOE to live up to its commitments to treat Native American Tribes in a government-to-government manner, noting that the EIS must assess impacts on tribal trust resources, and assure that tribal government rights and concerns are considered. As part of this forum, commentors noted that the EIS should: - evaluate the attitudes and options of Native American people toward the repository program, the DOE management of the program and other relevant activities - confer with Native Americans to protect sacred burial sites pursuant to existing law - identify natural resources of value to Native Americans and provide a means to avoid any impacts - consider that the site is within the ancestral territory of the Western Shoshone Tribe, and consult with the Tribe to address issues of minimization, degradation, and devastation - evaluate Western Shoshone land claims relative to DOE rights-of-way acquisition, location of burial sites, ceremonial sites, and other site-specific cultural resources within rail corridors. (16 commentors)
3 (Native American cultures)	Commentors stated that the EIS should acknowledge and assess the differences between Western civilization and Native Americans in terms of: - their relationship to nature - Native American ties to the land (cannot relocate because of contamination) - cultural implications in the aftermath of a radiological accident. (5 commentors)

Table A.13. Environmental Justice

Subissue (key words)	Comment Summary
1 (Transportation)	Commentors noted that the EIS should fully assess equity issues (i.e., environmental justice) along all potential transportation corridors. These commentors believe that the analysis should be addressed on a site-by-site basis (e.g., each Indian Nation, African-American communities), mile-by-mile for potential disproportionate impacts on economic, ethnic, or racial subgroups of the U.S. population (Native Americans, African-Americans). Further, the analysis should consider that often these communities: (1) do not have the ability to evacuate quickly in case of an accident, and in some cases would not learn of the accident in their area, (2) need to be reeducated to the dangers of SNF/HLW, and (3) may receive a disproportionate exposure because transportation will avoid major cities in favor of smaller communities. (18 commentors)
2 (Tribal lands)	Commentors requested that the EIS, as part of its environmental justice analyses, recognize that Yucca Mountain and the NTS are Western Shoshone land in consideration of the reserved right of the Western Shoshone government, not specifically granted through the Ruby Valley Treaty, and in further consideration of the United Nations Charter and Declaration Against Discrimination and Genocide. (8 commentors)

Table A.14. Noise and Aesthetics

Subissue (key words)	Comment Summary
1 (Noise)	One commentor stated that the EIS should assess baseline and project-induced noise levels along waste-transport routes in Lincoln County and at other County sites where repository components and activities would be located (intermodal transfer sites, borrow sites, highway-construction sites, and heavy-haul routes). Impacts to the quality of life and to wildlife from increased noise levels should be evaluated in the EIS. (1 commentor)
2 (Aesthetics)	Commentors requested that the EIS include an analysis of existing visual quality within basins in Lincoln County and in the Elko region, and a description of the visual impact from rail construction and operation. (3 commentors)

Table A.15. Performance Assessment

Subissue (key words)	Comment Summary
1 (Events and processes)	Commentors expressed the need for the repository EIS to evaluate events and processes, including those having low-probabilities of occurrence, but resulting in high consequences. Others requested the analysis of credible events and processes, and worst case events and processes (regardless of probability). Commentors requested that the EIS describe the seismic design and its basis, including a deterministic evaluation of maximum credible seismic events based on ground motion, as well as resulting secondary effects such as transient or long-term changes to the water table. Commentors also requested deterministic evaluations of both direct and indirect effects on the repository from volcanic activity. Design measures to mitigate the effects of events and processes (e.g., loss of water resources from contamination) were also requested. Events and processes identified by commentors included: (1) criticality (different kinds of events, multiple and repeated events, events resulting in explosions, events due to different fuel enrichments and plutonium disposal), (2) extreme seismic activity (resulting in pathways for contaminant release), (3) volcanism (volcanic explosions, consideration of "recent" events at Lathrop Wells cone), (4) tectonic events (crustal faulting), (5) meteorological events, (6) hydrological events, and (7) biological events. (151 commentors)

Table A.15. Performance Assessment (cont.)

Subissue (key words)	Comment Summary
2 (Engineered barriers)	Commentors wanted the EIS to address the abilities of the waste packages to contain SNF and HLRW (for thousands of years, forever, until full decay has occurred, how long?) given thermal dissipation requirements, radioactive bombardment, photodisintegration, nuclide release rates, failure under earthquake-induced stress, and other natural hazards. A commentor requested that the EIS select manmade and natural materials that will retard the movement of radionuclides for placement in the near-field around the waste packages. These materials were requested to reduce uncertainties associated with the retardation potential of the host rock and to be consistent with DOE's suitability guidelines and the U.S. Nuclear Regulatory Commission's regulations, both of which call for "multi-barrier" concepts. Another commentor requested that the EIS provide a description of engineered features that would provide adequate containment of C^{12} for 10,000 years, without reliance on natural barriers. One commentor requested a discussion of the measures that would ensure the integrity of repository seals, as well as any other barriers to permanently separate the waste from the environment. (18 commentors)

Table A.15. Performance Assessment (cont.)

Subissue (key words)	Comment Summary
3 (Performance assessment methods and uncertainties)	Commentors were concerned that the ability of the EIS to predict the long-term behaviors of the waste, their interactions with the natural and engineered barriers, and their ability to isolate waste would be insufficient. Others were concerned that insufficient data and information had been collected to predict behavior of the repository, and, accordingly, all assumptions should be presented in the EIS. Still others requested the EIS to adopt "excessive conservatism" to compensate for the magnitude and broad range of uncertainties in projecting analyses of the future. Others requested that the analyses consider gaseous pathways for radionuclide release, mineral deposits formed by thermal fluids, thermal overloading, thermal-induced ecosystem affects, thermal expansion and later subsidence, gaseous flux, groundwater heating, thermally induced fracturing affecting fluid flux, increased erosion due to ground surface denudation, local meteorological effects, the quality of the rock below the repository horizon, and radionuclide transport by mineral colloids. In general, the EIS should estimate the "long-term cumulative impacts to the environment and therefore to humans." Examples cited by other commentors were the potential for humans and the environment to be affected by transport of contaminated groundwater (Death Valley National Park, contamination of regional aquifer), and changes in the vadose zone from the high thermal load alternative. Some commentors questioned whether the EIS could provide information after failure of the waste packages such as mixing of various metals, minerals, isotopes, water, and heat. One commentor requested that a "maximum credible scenario" should be developed for releases from the repository. (414 commentors)
4 (Human intrusion)	Commentors were concerned that the analyses in the EIS could not reliably predict future human behaviors and thus there could be no sound basis for predicting the probability of human intrusion; therefore, the EIS should assess the impacts of a full range of human intrusion scenarios, including accidental (e.g., because Yucca Mountain is in a "world class mining district") and intentional (e.g., because of potential value to future societies) breach of the repository. (10 commentors)

Table A.15. Performance Assessment (cont.)

Subissue (key words)	Comment Summary
5 (Performance measures)	Commentors requested that the EIS consider the impacts of releases from the repository at the "population level." The EIS should report all dose response models and label each as to whether they are only fatal cancer models or include other health effects. Radon and other gaseous emissions via fracture pathways should also be evaluated. The long-term effects of heat on the ecosystem, and in turn how an altered ecosystem may effect waste isolation, should be analyzed in the EIS. Releases from the repository to the regional groundwater system (specifically Death Valley, Pahrump Valley aquifer, Ash Meadow area), based on a regional aquifer characterization program, must be considered. (7 commentors)
6 (Institutional controls)	Commentors expressed the need for the EIS to identify institutional controls (e.g., markers) that would endure for very long periods of time, particularly given the likelihood that government agencies and the English language may not survive that far into the future. Justification for this endurance, such as would be demonstrated by research on their effectiveness, was requested. (8 commentors)
7 (Duration of analysis)	Commentors requested that the post-closure environmental impacts be ascertained over the long-term, with long-term being defined by criteria "for the acceptable level of hazard." The time period selected for analysis by these criteria would then be presented in the EIS with a rationale for selection of various alternatives for analysis. Others suggested that the EIS identify the period for analysis based on how long the waste would remain lethal to humans. Examples of periods ranged from 1,000 to 1,000,000 years or until a peak dose is released. (6 commentors)

Table A.15. Performance Assessment (cont.)

Subissue (key words)	Comment Summary
8 (Future states)	Commentors asked for the EIS to address site conditions and future societies that may be impacted; both should be projected at least several thousand years into the future given geological history, climatological conditions and global warming/cooling, and land uses. Site conditions mentioned included effects from perched water in the repository block, flooding, and changing water tables. Some commentors acknowledged that predicting societal change over the long-term was impossible; however, they also requested the development of a credible framework for assessing these long-term socioeconomic and health impacts. (10 commentors)

Table A.16. Cumulative Impacts

Subissue (key words)	Comment Summary
1 (Cumulative impacts)	Commentors expected the EIS to analyze the cumulative environmental and radiological risks and hazards from all past, current and proposed radioactive waste and special nuclear materials activities at Yucca Mountain, the NTS, and surrounding environs. Commentors identified commercial and DOE-owned SNF, foreign research reactor SNF, HLW, Greater than Class C waste, special case waste, LLW, TRU waste, and special nuclear materials that should be included in these analyses. These analyses are also expected to consider transportation (all communities and Indian Nations, all routes, all modes, all rail spurs), storage and/or disposal, and treatment. More specifically, commentors requested that the EIS address: (1) both the 70,000 MTHM limit and the total estimated 85,000 MTHM of SNF, (2) all DOE-owned SNF, (3) all foreign research reactor SNF (~19.2 MTHM), (4) ~28,372 canisters of HLW (to be modified to reflect decisions from Hanford's tank waste EIS), (5) ~70,000 cubic feet of Greater than Class C, and (6) ~2.6 million cubic feet of special case waste. Commentors requested that the cumulative impact analyses assess the significance of direct and indirect long-term effects on the human and natural environment, such as impacts to human health (to "downwinders," local communities, and workers), ecosystems (with reliance on the NTS resource management plan), air quality, soils, socioeconomics, and local and regional groundwater resources. Impacts should be developed in consideration of: (1) contaminant levels from past weapons testing and associated research and development activities at NTS, (2) waste disposed of or planned for disposal at the NTS, (3) waste disposed of at the Beatty low-level waste site, (4) ongoing waste management, environmental restoration, and decontamination and decommissioning activities at NTS, (5) military operations, and (6) discharge of toxic metals from abandoned mines. Cumulative impacts must be assessed in time frames that range from 1,000 to 1,000,000 years. Commentors requested that the cumulative impact analyses be supported by credible scientific data, including the development of baseline health data, that have undergone peer review. In addition, the way in which equity and fairness issues are involved should be considered. (45 commentors)

Table A.17. Mitigation

	Comment Summary
1 (Financial compensation)	Many commentors indicated that the EIS and resulting Record of Decision should commit DOE to providing compensation for those communities and individuals negatively impacted (people nearby an accident, those contracting cancer). Commentors specifically indicated that compensation should be provided for: - project oversight by Native Americans (all tribes, not just the National Congress of American Indians), State of Nevada and affected counties - peoples suffering radiological exposure above guidelines - preparation of transportation (section 180(c) of the NWPA), including accidents, education, emergency response, medical training and monitoring to communities along transportation routes - potential disruptions (routine, accidents, sabotage) and environmental damage from the construction and operation of rail spurs (Eureka County) - health effects, floodplain damage, loss of game habitat/protected species, wetlands, disruption of crop production/marketing/transportation access, disruption of grazing patterns/marketing potential/mining and transportation access, and disruptions to historical rural and agricultural lifestyles - public safety training in local communities, especially affected governments and along highway or rail routes - Clark and Nye counties - infrastructure improvements and maintenance - communities and states that are burdened with HLW facilities - police and fire protection, the cost of health/accident/disease prevention programs, and participation in worker safety programs. (251 commentors)

Table A.17. Mitigation (cont.)

	Comment Summary
2 (Section 180(c) of the NWPA)	Commentors believed that the EIS should analyze the various options for implementing Section 180(c) assistance per the NWPA. (1 commentor)
3 (Mitigation)	Several commentors suggested that the EIS, Record of Decison and Mitigation Action Plan include a comprehensive identification and evaluation of specific measures to mitigate each repository system impact, both from accidents and non-accident conditions. Further, the mitigations must demonstrate that the measures will be sufficient to offset or otherwise minimize negative effects on the State of Nevada, local communities and other states and communities along transportation routes. These commentors believe that monitoring, avoidance, minimization, rectification, and reduction or elimination must be considered, as well as consultation with other appropriate agencies (as opposed to promises to consult, conduct further studies, only monitor, and request outside review). (26 commentors)
4 (Agency responsibilities)	Commentors requested that the EIS identify which agencies will pay for transportation-related improvements, mitigations, and monitoring programs. (1 commentor)
5 (Price Anderson Act)	One commentor called for the EIS to address liabilities in the absence of the Price Anderson Act. (1 commentor)

Table A.18. Program Cost

Subissue (key words)	Comment Summary
1 (Total life-cycle cost)	The EIS should provide estimates of the total life-cycle cost under each alternative (including No-Action and if Yucca Mountain becomes unacceptable). Cost should be a factor in the decision making process. The EIS should analyze cost impacts on a nationwide scope, not just the cost impacts at Yucca Mountain. Costs should be provided for all studies associated with site characterization; construction, operation, and closure of the repository; transportation; and post-closure. Costs associated with both routine and accident scenarios should be discussed. For accident scenarios the EIS should discuss financial responsibilities— An accident occurs at a utility, who pays for the clean up? During transportation, who pays? During operation of the repository, who pays? During post-closure, who pays? The EIS should include an analysis of costs associated with health impacts (sterilating miscarriage [sic], cancer, etc.), losses of tourism and business (including farming commodities value), loss of property value, loss of environmental opportunities because funding that has to be spent on the repository program will not be available to fund other environmental projects, and lack of distributed capital available to local economies. The analysis also should discuss factors that might influence the accuracy of cost estimates. (197 commentors)
2 (Funding sources and uncertainties)	The EIS should provide a full accounting of the past and future funding sources for the program; the potential uncertainties of continued funding from these sources and the impacts if funding is not sufficient; and analyze the fairness of the distribution between the sources. Some of these commentors felt that costs should be borne by the power companies and the ratepayers for nuclear utilities, and not by the taxpayer. In addition, costs for disposal of foreign research reactor SNF should be paid by the foreign governments. (17 commentors)

Table A.19. Socioeconomics

Subissue (key words)	Comment Summary
1 (Regions of influence)	Commentors stated that the EIS analyses of potential socioeconomic impacts should be conducted on specific populations, including Yucca Mountain area populations (unincorporated areas, cities and towns, counties, and Native American Reservations in proximity to Yucca Mountain), the State of Nevada, all areas affected by regional and national transportation of waste to the repository, and areas where waste might be stored. Other commentors preferred that the analyses be conducted at the community or neighborhood level, or by rural/suburban/urban areas. Commentors also recommended that the EIS provide a detailed evaluation of direct and indirect impacts on public services, state and local services, and state governments that occur as a result of the project, whether as fees, taxes, or other payments. The services to be assessed include all state and local government services that contribute to the program, and state and local public services to the direct, indirect, and induced population and households resulting from the program. The estimates of costs for these services should include expenses for all services, facilities, equipment, infrastructure, and staff. Revenues should be calculated for the project and these revenues should be compared to the costs of services. Services by jurisdiction and type of service should be analyzed and the analysis should be allocated to the proper jurisdictions consistent with the state and local fiscal structure. Lastly, commentors called for the EIS to estimate those impacts that are due to intergovernmental conflict, including costs of legal adjudication, law enforcement and criminal justice services, political activities, and restrictions on state/local/federal relations. (16 commentors)

Table A.19. Socioeconomics (cont.)

Subissue (key words)	Comment Summary
2 (Baseline affected environment)	Commentors stated that the EIS analysis of potential socioeconomic impacts should be evaluated against a baseline affected environment. Some commentors viewed the baseline as existing without Yucca Mountain site characterization activities. Commentors provided detailed lists of parameters to be described in the baseline, including: - economic (employment and income by SIC sector), demographic, social, and public finance conditions (including growth trends) - conditions in the State of Nevada, southern Nevada counties and sub-county jurisdictions, communities, and impact areas (including government structures and finances, military operations, telecommunication capabilities, community services, emergency management, public health, land use, and transportation infrastructure and traffic) - economic base in the State of Nevada, southern Nevada counties, and key sub-county communities - key interregional linkages for each major component of the economic base at each of the above levels - current demographic and social character, public perceptions, and political landscape - local government service systems and expenditures at each of the above levels (including state-shared revenues) - Nevada's state/local revenue structure, and the revenues generated for public funds at each of the above levels - community social conditions. One commentor suggested the EIS should attempt to incorporate the trend toward increased per capita local government service costs. (5 commentors)

Table A.19. Socioeconomics (cont.)

Subissue (key words)	Comment Summary
3 (Impact parameters)	Commentors indicated that the EIS analysis of potential socioeconomic impacts should examine impacts during construction (including necessary nationwide transportation infrastructure improvements), operation, closure, and post-closure of the repository (one commentor requested the analysis also be applied to impacts for recent layoffs from the Yucca Mountain Site Characterization Project). They recommended that the analysis include impacts under routine operations and following accidents. Analyses should include potential impacts to: employment, wages, income, population growth, procurement, limited infrastructures (including transportation and traffic), tourism, population growth (negative impacts not related to project employment), schools, business, insurance recovery, property values, local government finances and fiscal conditions, health care costs, loss of economic potential associated with the withdrawal of land for the repository, transportation corridors and any buffer zones, and local politics and intergovernmental relations. One commentor suggested the EIS should assess the technological assets the project might bring to Nevada including projections of supporting science and techno/scientific spinoff development. Others thought the EIS should consider the social impact from the repository project, which may increase public dissatisfaction with their government or alter community cooperation and/or conflict. One commentor suggested the EIS, in evaluating these impacts, should consider multiple construction scenarios, for example construction by a single crew or multiple crews. (25 commentors)
4 (Consultation)	During preparation of the socioeconomic impacts analysis, commentors suggested that DOE work closely with county and tribal governments to consider the views of these organizations. In addition, commentors emphasized that DOE should utilize data, evaluation models, and studies prepared by counties in their analyses. (5 commentors)

Table A.19. Socioeconomics (cont.)

Subissue (key words)	Comment Summary
5 (Depth of analysis)	Commentors believed that the socioeconomic analysis should be conducted at a level which reveals rather than obscures potential impacts, and which supports evaluation at the community level. Key dimensions included: - annual estimates of transportation shipments, employment, and procurement effects, analysis at community-specific geographic levels (worksite locations, community ZIP code, place of residence, or procurement destination of payment), and shipments by Nevada transportation route segment - cause and effect links between expenditure, management policy, work activity, and estimated Nevada employment and procurement - cause and effect links between the current and projected inventory, the acceptance schedule, and the characteristics of shipment campaigns - cause and effect links between projected shipments, surface facility capacities, and permanent disposal capacity. One commentor suggested the EIS should discuss socioeconomic impacts in cause and effect terms to allow reviewers to understand and trace the estimation of potential impacts. (2 commentors)
6 (Decisions)	One commentor believed that the EIS, in reaching a decision for selection of transportation routes, should consider the potential socioeconomic impacts. (1 commentor)

Table A.19. Socioeconomics (cont.)

Subissue (key words)	Comment Summary
7 (Mitigation)	Several commentors believed that the EIS should discuss possible mitigations to offset or compensate negative socioeconomic impacts and provide analysis of how the measures would offset impacts. Suggested methods to mitigate impacts included use of Department policies that would encourage project employees to reside in specific counties, use of union versus non-union labor, or procurements being awarded to local companies. Some commentors requested this discussion should provide all sources of compensation for the diminution of property values caused by property being located in proximity to transportation routes and sources of compensation for takings of business opportunities and property interests which may be caused by perception-based impacts. One commentor stated the EIS should address how the program will achieve acceptable equity and fairness standards for the key affected communities, states, and participants. This analysis should consider acceptance in terms of a burden placed upon state and local governments and citizens. (6 commentors)
8 (Description of alternatives)	Commentors requested the EIS to present sufficiently detailed descriptions, for each alternative, in terms useful for socioeconomic analysis and comparison between alternatives. The descriptions should include detailed data on: annual expenditures, employment, and procurement; annual waste and material transportation shipments; management policies (busing, housing, per diem, food service, etc.); and any community development programs or intergovernmental agreements for the provision of service to project. (2 commentors)
9 (Program uncertainties)	A commentor recommended that the EIS discuss uncertainties and potential changes within the Yucca Mountain Project and the Civilian Radioactive Waste Program that may be affected by funding adequacy and socioeconomic impacts. (1 commentor)

Table A.19. Socioeconomics (cont.)

Subissue (key words)	Comment Summary
10 (Analysis methods)	Three commentors stated that the EIS should use socioeconomic models that consider local projections and not rely on national or regional projections. The models should consider economic and population growth driven by retirement and "lifestyle" migration, and should operate at a sub-county level. All assumptions used in the analysis should be made explicit and justified by reference to social science theory and/or experience in analogous cases. And, the methods by which impacts are estimated should be specified so that they can be reviewed and validated. Conclusions and findings should account for the applicable data and present the logic for any professional judgments, including specification of probabilities and ranges of uncertainty when appropriate. Conditions for which there are insufficient data or theory to make a finding should be identified, the current level of knowledge should be explained, and the implications for drawing conclusions should be presented. The EIS should then make recommendations for resolving significant issues that cannot be properly evaluated due to data or theory limitations. (3 commentors)

Table A.20. Accidents

Subissue (key words)	Comment Summary
1 (Accidents)	Commentors stated that the EIS should evaluate credible accidents. Some commentors offered specific accidents for analysis. Specific concerns expressed by commentors were: - terrorist attacks or sabotage - contamination and cleanup - evacuation - impacts on tourism - compensation - radiation exposure. (25 commentors)

Table A.21. General

Subissue (key words)	Comment Summary
1 (Opposition to project, repositories, and nuclear power)	Commentors expressed a general opposition to Yucca Mountain (or Nevada in general) as a location for the proposed repository, repositories in general, and nuclear power. While some commentors provided no specific reasons for their opposition, reasons that were provided included: selection of the site was politically motivated, not scientifically motivated; Yucca Mountain is not suitable (perceived technical and safety problems); insufficient knowledge of the impacts of the repository; fear of the health effects of radioactivity; if there is no nuclear power, there will be no nuclear waste and no need for a repository; Nevada didn't create the waste so they shouldn't have to dispose of the waste; the people of Nevada have had more than their share of undesirable government projects (e.g., nuclear weapon testing at the NTS); there is no way to guarantee safety; fear that burying radioactive waste will make the earth uninhabitable; preference for solar power; fear that once SNF and HLW start coming to Nevada other types of waste will also be sent to Nevada for disposal; and the waste should not be buried, real solutions to the problem should be found. One commentor noted that they have been monitoring the Yucca Mountain Project (and other DOE activities) in the past and would continue to do so. (694 commentors)
2 (Support for project, repositories, and nuclear power)	Commentors expressed general support for: the designation of Yucca Mountain as the location for the proposed repository, the need of a repository, the job the DOE was doing on characterizing the site, and/or nuclear power (some citing the need for a strong nuclear deterrent). Some comments included: Nevada needs to help solve the national environmental problem of nuclear waste disposal, the health risks are acceptable, the project will bring jobs and other technological benefits to Nevada and the State (or citizens) of Nevada should be specifically targeted for direct or indirect compensation, the environment surrounding Yucca Mountain has already been impacted by nuclear testing, the historical record indicates that the emergency response infrastructure would require only minor enhancements to handle the shipments, and the archaeological record and studies support deep geologic disposal. Other commentors felt that the project had been studied enough and DOE should move forward. One commentor encouraged DOE to use well-trained people in operation of the repository. (38 commentors)

Table A.21. General (cont.)

Subissue (key words)	Comment Summary
3 (Distrust of DOE and/or project opposition)	Commentors expressed a general distrust for the DOE, in part based on a history of lies, mistakes, and broken promises. Commentors also criticized the distorted information provided by anti-Yucca Mountain groups and encouraged the DOE to use properly trained and experienced scientists and engineers to inform the public. Some commentors criticized both sides of the debate and encouraged the formation of an unbiased panel of scientists and engineers. (19 commentors)
4 (Opposition to transporting radioactive material)	Commentors expressed a general opposition to transport of SNF, HLW, or radioactive material in general. Comments supporting this opposition included: railroads are unsafe, fear of exposure to radioactivity, fear of accidents, dangers can not be 100% eliminated, and railroads would prohibit access to lands. Some commentors suggested that the public and state governments should, and will, protest transportation by blocking highways and railways. (366 commentors)
5 ("Voting" for no action)	Commentors suggested that the Yucca Mountain project should be canceled and that the waste should be stored at the point of generation, some "voted" for DOE to adopt the No-Action alternative which would leave the waste at the generators. These comments were not supportive of DOE evaluating a No-Action alternative, rather, they advocated making the decision in absence of analysis. Reasons for this suggestion were not always provided; however, some reasons included: generator storage would be less costly, storage at generators decentralizes the risk of terrorist attack, opposition to transportation because of the potential risks involved in transportation, the generators reaped the benefit from nuclear power (or defense activities) so they should suffer the potential consequences, and no-action would be safer. (88 commentors)

Table A.21. General (cont.)

Subissue (key words)	Comment Summary
6 (Comments directed to the public)	Commentors directed some of their comments to the public. Comments included: the NEPA process is the public's opportunity to voice opposition or support and the public is failing to take advantage of their opportunity to provide input into the NEPA process. Commentors noted poor attendance at the scoping meetings and indicated the public asked questions and provided comments on unrelated subjects. Other comments offered advice on sources of public information. (4 commentors)
7 (NEPA process)	Some commentors felt that the NEPA process was costly; others felt the process only served to provide environmental extremists a method to delay or halt important projects. Some commentors felt that the ultimate decision on the repository should be left up to a national vote. (3 commentors)
8 (Criticisms of DOE)	Commentors criticized DOE on several issues, including; failure to establish a firm policy for SNF management after more than 50 years, forcing the repository program on the people. Several commentors criticized DOE for distributing a questionnaire {*the questionnaire was actually distributed by project opponents and received extensive use by the public*}. One commentor hinted the DOE was not "environmental conscious" by failing to use recycled paper products. (7 commentors)

Table A.21. General (cont.)

Subissue (key words)	Comment Summary
9 (Comments on unrelated actions)	Commentors commented on actions and projects unrelated to Yucca Mountain. Examples included comments on: the Ward Valley Nuclear Waste Site in California, Senate and Congressional bills related to interim storage (opposition to the establishment of an interim storage facility in Nevada), the NTS Sitewide EIS, the Programmatic EIS for Storage and Disposition of Weapons-Usable Fissile Materials, operation of the NTS (general management perspective), the need for alternative energy sources such as solar power and hydrogen-powered fuel cells, the need for energy conservation, federal land control in Nevada, monitored retrievable storage in New Mexico, and financial rewards to persons that find practical solutions to continued use of radioactive materials. One commentor offered a marriage proposal to the Secretary of Energy, Hazel O'Leary. (16 commentors)
10 (Clarification)	Commentors provided clarifications to perceived misconceptions. These misconceptions included: the definitions of HLW, the applicability of court rulings, "intermodal transfer capability" was incorrectly referred to as "intermodal transfer facility," Multi-Purpose Canisters would be shipped in Nuclear Regulatory Commission certified "overpacks" not "casks," and the purposes of the NWPA. (5 commentors)
11 (Support for NEPA process)	Commentors expressed general support for the NEPA process, specifically the information distributed to the public, the process for preparing an EIS, and the need to consider the potential for environmental impacts. Some said they would support the project if it proved to be the best option. Others emphasized that the public would never be for the project, but a decision must be made. (7 commentors)

Table A.21. General (cont.)

Subissue (key words)	Comment Summary
12 (Citizen rights)	Commentors expressed opinions that the Government of the United States (and in particular the DOE) does not have the right to impose the Yucca Mountain project on the State of Nevada, only the people have the right, and they oppose government intervention. (5 commentors)
13 (Decisions already made)	Commentors suggested that the Yucca Mountain has already been selected by DOE (some commenting that underground construction was well underway), nothing will alter that selection, and the comment process and the EIS were mere formalities. (5 commentors)