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***Nuclear Waste Policy Act***  
***(Section 112)***

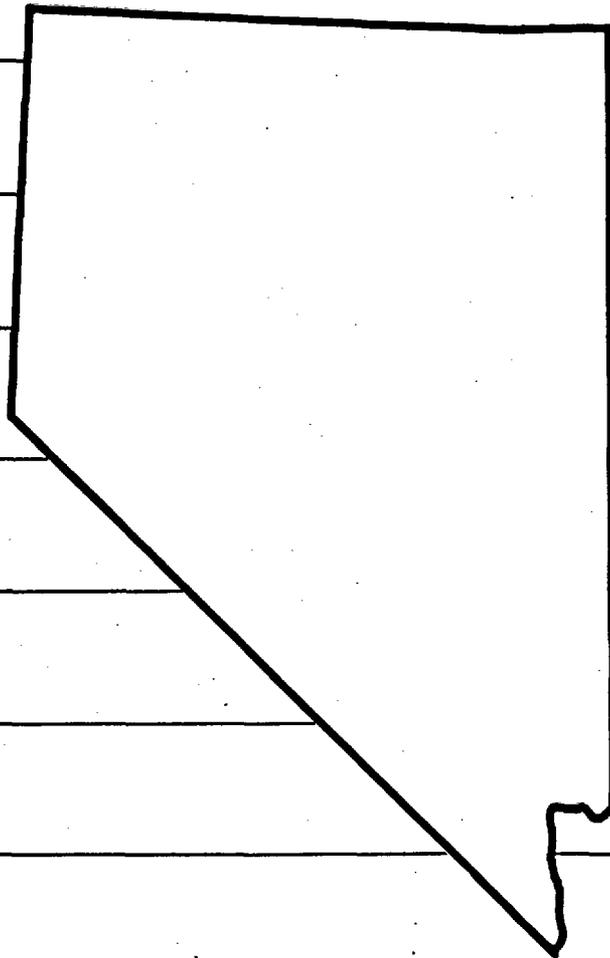
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***U.S. Department of Energy***  
***Office of Civilian Radioactive Waste Management***



***Background Information on the  
Draft Environmental Assessment***

***Yucca Mountain Site, Nevada***  
***Winter 1985***



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## TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION	1
II. SITING PROCESS	3
● Nuclear Waste Policy Act of 1982	4
● Steps of The Siting Process	5
● Siting Guidelines	7
● Schedule For the First Repository	9
III. DRAFT ENVIRONMENTAL ASSESSMENTS	10
● Nuclear Waste Policy Act Requirements for Environmental Assessments (EAs)	11
● Overview of Draft EA Content	12
IV. PUBLIC PARTICIPATION PROCESS	15
● Public Participation in the Development of the Draft EAs	16
● Public Comment on the Draft EAs	17
● Reference Availability	19
V. ISSUE TRACKING	21
● How to Track Issues in the Draft EA	22
● Examples of Issue Tracking	23

**I N T R O D U C T I O N**

## INTRODUCTION

The background information presented here is intended to provide assistance to State and local officials and the public in reviewing the draft environmental assessment (EA) prepared for the Yucca Mountain site in Nevada. This site is one of the nine proposed by the Department of Energy for consideration as the nation's first high-level radioactive waste repository. Similar material is being distributed in communities near each of the other eight sites.

This information discusses the siting process for a repository, the purpose and general contents of the draft EAs, their role in the decision process, and how the public can participate. It also suggests a procedure for tracking issues in the EAs.

**SITING PROCESS**

## NUCLEAR WASTE POLICY ACT OF 1982

By the end of this century, the United States plans to begin the operation of the first geologic repository for the permanent disposal of commercial spent nuclear fuel and high-level radioactive waste. Public Law 97-425, the Nuclear Waste Policy Act of 1982 (the Act), specifies the process for selecting a repository site and assigns the primary responsibility for implementing the law to the U.S. Department of Energy (DOE).

- One of the key provisions of the Act is "to establish a schedule for the siting, construction, and operation of repositories that will provide reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent nuclear fuel as may be disposed of in a repository" [Section 111(b)(1)].
- The Act establishes a process for selecting and developing repositories, with extensive provisions for consultation and cooperation with affected States and Indian tribes.
- The Act also provides a mechanism for financing the cost of disposal of spent fuel and high-level waste and sets forth other provisions relating to nuclear waste disposal.

## STEPS OF THE SITING PROCESS

- The Act requires that DOE consider a number of alternative sites in different rock types as a part of the process leading to the selection of a site for the Nation's first repository. In February, 1983, DOE carried out the first requirement of the Act by identifying nine sites in the following locations as potentially acceptable sites for the first repository (the host rock of each site is noted in parentheses):

- Vacherie dome, Louisiana (domal salt)
- Cypress Creek dome, Mississippi (domal salt)
- Richton dome, Mississippi (domal salt)
- Yucca Mountain, Nevada (tuff)
- Deaf Smith County, Texas (bedded salt)
- Swisher County, Texas (bedded salt)
- Davis Canyon, Utah (bedded salt)
- Lavender Canyon, Utah (bedded salt)
- Reference Repository Location, Hanford Site, Washington, (basalt flows)

- The Act requires that DOE nominate at least five of the nine sites as suitable for site characterization.
- The sites proposed to be nominated in the draft EAs (in alphabetical order by State):

- Richton dome, Mississippi
- Yucca Mountain, Nevada
- Deaf Smith site, Texas
- Davis Canyon, Utah
- Hanford site, Washington

The final Environmental Assessments will serve as the basis for nominating these sites. This step involves determining whether any sites are disqualified (as defined in the siting guidelines), and then comparing sites in similar geohydrologic settings.

- The Act then requires that DOE recommend to the President three of the five nominated sites for site characterization.

- Sites proposed as preferred for site characterization in the draft EAs are (in alphabetical order by State):

- Yucca Mountain, Nevada
- Deaf Smith site, Texas
- Hanford site, Washington

Again, the final Environmental Assessments will serve as the basis for selecting the sites to be fully characterized.

- After Presidential approval of the three recommended sites, site characterization will begin. Draft site characterization plans will be issued for each of the three recommended sites and exploratory shaft construction will begin.
- After completion of site characterization, an Environmental Impact Statement (EIS) will be prepared and the Secretary of Energy will recommend one site to the President as the repository site.
- Upon his approval, the President will recommend the repository site to Congress. The Act provides that the State and an eligible affected Indian tribe may submit to Congress a formal notice of disapproval. If a notice of disapproval is submitted, further consideration of that site will stop unless Congress passes a joint resolution approving the repository siting recommendation.

## SITING GUIDELINES

- After identifying the nine potentially acceptable sites, DOE published draft General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories (guidelines) in accordance with the Act. The guidelines contain factors that have been used by DOE in nominated sites for characterization.
- The guidelines require consideration of:
  - geologic features to ensure long-term isolation;
  - features affecting the environment, socioeconomics, and transportation;
  - features affecting ease and cost of siting, constructing, and operating a repository;
  - various rock types and recommendation of different rock types to the extent possible; and
  - factors affecting radiological health and safety, such as proximity to population centers.
- The guidelines also include factors that qualify or disqualify sites such as:
  - location of valuable natural resources;
  - groundwater travel time;
  - dissolution;
  - erosion;
  - proximity to population centers;
  - effects on rights of users of water; and
  - proximity to national parks, national wildlife refuges, national wild and scenic rivers, national wilderness preservation system, or national forest lands.
- The proposed guidelines were issued for public review and comment on February 7, 1983, followed by public hearings in March and April. Public participation in this process was extensive, with over 2,000 comments received. DOE prepared draft alternative guidelines and made them available to the public for comment on June 7, 1983. Approximately 900 comments on this draft were received by DOE.

- Following a period of consultation with the States, DOE submitted final draft guidelines to the Nuclear Regulatory Commission in November, 1983. The Nuclear Regulatory Commission concurred on the guidelines on June 22, 1984.
- Final siting guidelines were published in the Federal Register in December, 1984, and will be codified as 10 CFR Part 960.

## SCHEDULE FOR THE FIRST REPOSITORY

- Public Comment Period for Draft EAs Closes--3/20/85
- Publish Final EAs--Summer 1985
- Formal Nominations and Recommendations to President--Summer 1985
- President Approves 3 Sites for Characterization--Summer/Fall 1985
- Issue Site Characterization Plan--Fall/Winter 1985
- Exploratory Shaft Construction Initiated
  - Hanford Site (Spring 1986)
  - Yucca Mountain Site (Summer 1986)
  - Deaf Smith Site (Spring 1987)
- Issue Draft EIS on Site Selection--1990
- President Recommends Site--1991
- Licensing Completed--1993/94
- Complete Phase I Construction--1997
- Begin Phase I Operation--1998
- Complete Phase II Construction--2000
- Begin Full Operation--2002

**DRAFT ENVIRONMENTAL ASSESSMENTS**

## NUCLEAR WASTE POLICY ACT REQUIREMENTS FOR ENVIRONMENTAL ASSESSMENTS

- The Act requires DOE to prepare Environmental Assessments (EAs) to accompany the nomination of at least five sites as suitable for site characterization.
- The Act does not require that draft EAs be issued to the public. DOE, however, is making draft EAs available for public review and comment for each of the nine potentially acceptable sites in order to permit maximum public participation in this important step in the repository siting process. The final EAs will be based on consideration of all comments received.
- The draft EAs contain the following information and evaluation consistent with the requirements for final EAs in Section 112 of the Act:
  - a description of the decision process by which the site is being considered for nomination;
  - a description of the site and its surroundings;
  - an evaluation of the effects of site characterization activities on the public health and safety and the environment;
  - an assessment of the regional and local impacts of locating the proposed repositories at the site;
  - an evaluation of the site's suitability for site characterization;
  - an evaluation of the site's suitability for development as a repository; and
  - a comparative evaluation of the site with other sites and locations that have been considered.

## OVERVIEW OF DRAFT EA CONTENT

### Executive Summary

The Executive Summary highlights the information found in the draft EAs and presents a summary of the decision process that will lead to the site nomination and recommendation. It also presents preliminary conclusions about the Yucca Mountain site based on the information and evaluations contained in the draft EA.

### Chapter 1: Process for Selecting Nuclear Waste Repository Sites

Chapter 1 describes the overall process for selecting nuclear waste repository sites, including a description of the legal authority and schedule for DOE to develop a geologic repository; an explanation of a geologic repository; an explanation of the role of the EAs in the site selection process and an outline of draft EA contents; a review of the site screening process leading to the identification of potentially acceptable sites; and a grouping of sites into geohydrologic settings.

### Chapter 2: Process of Selecting the Yucca Mountain Site as One of Nine Potentially Acceptable Sites

Chapter 2 describes the process by which the Yucca Mountain site was selected as one of nine potentially acceptable sites for further consideration. This chapter also provides an evaluation, based on available information, of the characteristics of the Yucca Mountain site against the disqualifying conditions of the DOE General Guideines for the Recommendation of Sites for Nuclear Waste Repositories.

### **Chapter 3: The Site**

Chapter 3 provides a description of the Yucca Mountain site and the surrounding area in terms of the present understanding of the geologic and hydrologic conditions present or inferred by available data. It contains a description of the environmental setting of Yucca Mountain along with discussions of the existing transportation infrastructure, socioeconomic conditions in surrounding areas, and the fiscal and government structure of those communities considered most likely to experience impacts should the Yucca Mountain site be recommended for site characterization and repository development.

### **Chapter 4: Expected Effects of Site Characterization Activities**

Chapter 4 evaluates the potential effects of the proposed characterization activities at the Yucca Mountain site on the environment as defined in Chapter 3. These proposed activities include field studies, construction of an exploratory shaft to the proposed repository depth in Yucca Mountain, and other studies to investigate site suitability.

### **Chapter 5: Effects of Locating the Proposed Repository**

Chapter 5 provides a preliminary evaluation of regional and local effects should the site be selected as the first repository location. Although based on a preliminary design, the impacts of construction, operation, and decommissioning of a repository are assessed with regard to effects on the physical environment, transportation infrastructure, socioeconomic conditions, and fiscal and government structure in the affected area.

## **Chapter 6: Evaluation of the Suitability of the Yucca Mountain Site for Site Characterization and Development as a Repository**

Chapter 6 provides an evaluation of the suitability of the Yucca Mountain site for site characterization and for development as a high-level waste repository. This evaluation is conducted through a comparison of the characteristics of the Yucca Mountain site with the criteria of the DOE General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories. Suitability of the site for development as a repository is assessed through application of those guidelines which do not require data from site characterization. Suitability for site characterization is evaluated by comparing known information about the site against the criteria and conditions of those guidelines which do require site characterization data, but for which a preliminary finding can be made at this time.

## **Chapter 7: Comparative Evaluation of the Sites Proposed for Nomination**

Chapter 7 provides a comparative evaluation of sites to be proposed for nomination. It explains the purpose, requirements, and approach to comparative evaluation as to how the site meets the Act and guidelines requirements. The five sites proposed for nomination were compared to derive a ranking of sites for each technical guideline. These rankings were then combined to derive for each site:

- 1) a ranking for the set of guidelines that relates to events after closure of the repository,
- 2) rankings for each of three groups of guidelines relating to events before the repository is closed,
- 3) a ranking for the entire set of "preclosure" guidelines, and
- 4) an overall ranking for all of the guidelines (preclosure and postclosure).

**PUBLIC PARTICIPATION PROCESS**

**PUBLIC PARTICIPATION IN THE DEVELOPMENT  
OF THE DRAFT EAs**

- In March, April, and May, 1983, DOE held public hearings in the vicinity of each site to inform the residents of the area of the proposed nomination of the site and to solicit recommendations of issues to be addressed in the EA and site characterization plan for each site.
- Issues within the scope of the EAs raised at the hearings or received by mail are addressed in the draft EAs prepared for each site.
- Workshops on EA issues were held with State officials in August, 1983.

## PUBLIC COMMENT SCHEDULE

### Availability of Draft EAs

December 20, 1984 Notice of availability of draft EAs in the Federal Register with announcement of briefings. A 90-day comment period is then scheduled. DOE will accept comments in writing and will conduct hearings for receipt of oral comments.

Send written comments to:

EA Comments  
Department of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585

March 20, 1985 Close of 90-day comment period.

### Briefing Schedule

Informal, interactive briefing will be held by DOE to discuss the draft EA and to answer questions. The briefing schedule for Nevada is as follows:

January 8, 1985	9:00 a.m.	State, county and local officials, Carson City
January 22, 1985	7:00 - 10:00 p.m.	Public, Las Vegas John Wright Auditorium UNLV Campus 4505 S. Maryland Pkwy. Las Vegas, NV 89154
January 23, 1985	7:00 - 10:00 p.m.	Public, Beatty Beatty Community Center Beatty, NV 89003
January 24, 1985	7:00 - 10:00 p.m.	Public, Reno Pine Room UNR Camus Reno, NV 89557

### Hearing Schedule

Formal hearings will be held by DOE to accept comments on the draft EAs. The hearing schedule in Nevada is as follows:

February 25, 1985	Amargosa Valley Community
10:00 a.m. - 2:00 p.m.	Center
6:00 p.m. - 10:00 p.m.	Amargosa Valley, NV 89020
February 26, 1985	Hacienda Hotel - Madrid Room
10:00 a.m. - 2:00 p.m.	3950 Las Vegas Blvd. South
6:00 p.m. - 10:00 p.m.	Las Vegas, NV 89119
February 28, 1985	Pine Room -
10:00 a.m. - 2:00 p.m.	Jot Travis Student Union
6:00 p.m. - 10:00 p.m.	UNR Campus
	Reno, NV 89557

## REFERENCE AVAILABILITY

Reference cited in the draft Environmental Assessments are available for public review at the following locations.

Amargosa Valley Community Library  
Star Route 15  
Box 40-T  
Amargosa Valley, NV 89020  
Mon. - Thurs., 10:00a.m. - 4:00p.m.

Beatty Community Library  
4th and Ward  
P.O. Box 128  
Beatty, NV 89003  
Mon. - Fri., 8:30a.m. - 4:45p.m.

Clark County Library  
1401 E. Flamingo  
Las Vegas, NV 89109  
Mon. - Thurs., 9:00a.m. - 9:00p.m. ;  
Fri. - Sat., 9:00a.m. - 5:00p.m. ;  
Sun., 1:00 - 5:00p.m.

Law Library  
Nye County Courthouse  
P.O. Box 393  
Tonopah, NV 89049  
Mon. - Fri., 8:00a.m. - 5:00p.m.

Lincoln County Library  
P.O. Box 330  
Pioche, NV 89043  
Mon., Wed., Thurs., Fri., 12:00 - 4:00p.m. ;  
Tues., 1:00 - 5:00p.m.

Nevada Legislative Council Bureau  
Research Library  
Legislative Building  
Capitol Complex  
Carson City, NV 89710  
Mon. - Fri., 8:00a.m. - 5:00p.m.

Nevada State Library  
401 N. Carson  
Capitol Complex  
Carson City, NV 89710  
Mon. - Fri., 8:00a.m. - 5:00p.m.

Northern Nevada Community College  
Learning Resource Center  
901 Elm Street  
Elko, NV 89801  
Mon. - Thurs., 8:00a.m. - 9:00p.m.;  
Fri., 8:00a.m. - 5:00p.m.;  
Sat., 9:00a.m. - 1:00p.m.

University of Nevada at Las Vegas  
James R. Dickinson Library  
4505 Maryland Parkway  
Las Vegas, NV 89154  
Mon. - Fri., 8:00a.m. - 4:45p.m.

University of Nevada at Reno  
Getchell Library  
Reno, NV 89557  
Mon. - Fri., 8:00a.m. - 5:00p.m.

United States Department of Energy  
Nevada Operations Office  
Public Reading Room  
2753 South Highland  
Las Vegas, NV 89109  
Mon. - Fri., 7:30a.m. - 4:30p.m.  
(closed 12:00 - 1:00p.m.)

Washoe County Library  
301 South Center Street  
Reno, NV 89501  
Mon. - Wed., 10:00a.m. - 9:00p.m.;  
Thurs. - Fri., 12:00 - 6:00p.m.;  
Sat. - Sun., 1:00 - 5:00p.m.

**ISSUE TRACKING**

## HOW TO TRACK ISSUES IN THE DRAFT EA

To track an issue or issues of concern in the EA, start by consulting Chapter 3 for information collected about that issue or factor(s). Chapters 4 and 5 describe the probable impacts on the site of site characterization and repository construction/operation, respectively. Chapter 6 evaluates the site in terms of its compliance with the siting guidelines. Considered in Chapter 6 are the qualifying conditions that must be satisfied for the site to be acceptable with respect to the factor, as well as the associated favorable or potentially adverse conditions. Chapter 7 then compares the site qualities with those of other sites being considered for recommendation. Following are several sample issues tracked through the Yucca Mountain draft EA using this method.

## UNSATURATED ZONE HYDROLOGY

A unique aspect of the hydrologic conditions at Yucca Mountain is that radionuclide movement from the repository, if any, will have to occur through rocks which are not saturated with water. The information about the unsaturated zone is used in the draft Environmental Assessment (EA) to develop the discussions on migration of radionuclides in ground water, and the reader is referred to that section in this book. The following discussion highlights those sections in the draft EA where the unsaturated zone hydrology is discussed.

### Current Status

A description of the hydrologic conditions at Yucca Mountain is presented in Sections 2.1 and 3.2. These discussions provide the basic information about the role of the unsaturated zone in hydrologic processes at Yucca Mountain.

### Site Characterization

The field activities which will be performed to obtain data about the unsaturated zone at Yucca Mountain are described in Section 4.1. Environmental impacts associated with these activities are examined in Section 4.2.

### Repository

The design, construction, and operation of a repository at Yucca Mountain must consider the properties of the unsaturated zone. This consideration is addressed in a preliminary fashion only in Chapter 5.

### Siting Guidelines

The Siting Guideline on Geohydrology requires discussion on the unsaturated zone hydrology; this information is presented in Section 6.3.1.1 where several of the conditions directly address unsaturated zone considerations. Information on the unsaturated zone is also required for the preliminary performance assessment about radionuclide migration presented in Section 6.4.

## **AQUIFER DEPLETION**

Development of a repository at Yucca Mountain will lead to the use of water from local reservoirs. One potential impact of this water use could be a depletion of regional water supplies. This topic is discussed in the draft Environmental Assessment (EA). The following discussion highlights those sections in the draft EA where this subject is discussed.

### **Current Status**

The discussions on ground water use consider the regional hydrology of the Yucca Mountain area, and are presented in Section 3.3. That section contains information on ground-water basins, water quality, and present and projected use of water in the area. More detailed discussions of water supply can be found in Section 3.6.

### **Site Characterization**

The field activities to be undertaken during site characterization, particularly the construction of the exploratory shaft, will require water from local aquifers. Information about the supply system can be found in Section 4.1. A discussion of the effects of ground water withdrawal for site characterization is presented in Section 4.2

### **Repository**

The construction and operation of a repository will require water to be supplied from local aquifers. The repository requirements are presented in Section 5.1. The impacts on the hydrologic system of locating a repository at Yucca Mountain are presented in Section 5.2. Effects on community water supplies are discussed in Section 5.4.

## **Siting Guidelines**

The discussions pertinent to the question of aquifer depletion are found in the technical guidelines and the corresponding system guideline. A discussion on the presence of ground water sources along potential ground water flow paths from the host rock to the accessible environment can be found in Section 6.3.1.1. Ground water quality and the potential for future ground water withdrawal are discussed in Section

Socioeconomic impacts due to repository water use are discussed in Section 6.2.1.7. The corresponding system guidelines discussions are Section 6.4 for the post closure preliminary performance assessment, and, Section 6.2.2 for the preclosure system guideline on environment, socioeconomics, and transportation.

## **TECTONIC STABILITY AND EXPECTED GROUND MOTION**

Isolation of radionuclides from the accessible environment depends upon maintaining the integrity of the surface and underground facilities. Tectonic stability and expected ground motion at the Yucca Mountain site are important considerations for both the post closure concern for isolation and containment and the preclosure concern for safety during construction and operation. The following discussion, which indicates where in the draft Environmental Assessment (EA) such information is presented, focuses on naturally occurring phenomena.

### **Current Status**

The regional geohydrologic setting at Yucca Mountain, including an overview of the tectonic processes that led to the present situation at Yucca Mountain, is presented in Section 2.1. A description of the geologic conditions at Yucca Mountain is presented in Section 3.2 and includes a discussion of the structural features and seismicity of the site.

### **Site Characterization**

The field activities required to obtain the data needed to make assessments about tectonic stability and expected ground motion are reviewed briefly in Section 4.1. Environmental impacts related to these activities are examined in Section 4.2.

### **Repository**

The design of a repository at Yucca Mountain must consider tectonic stability and expected ground motion. However, this consideration does not directly contribute to the effects of locating a repository at Yucca Mountain. Hence, this topic is not discussed, other than by reference, in Chapter 5.

## **Siting Guidelines**

The topic of expected ground motion and tectonic stability is treated in two technical guidelines and, accordingly, in two system guidelines. It is of concern for preclosure considerations of effects on construction, operation, and closure, particularly for the surface facilities. The preclosure Tectonics guideline, discussed in Section 6.3.3.4, presents information about tectonic stability and expected ground motion. The preclosure system guideline on ease and cost of siting, construction, operation, and closure (Section 6.3.4) also presents information on this topic.

## MIGRATION OF RADIONUCLIDES IN GROUND WATER

The movement of ground water provides a vehicle whereby radionuclides can migrate to the accessible environment. The potential for this occurrence is addressed in the draft Environmental Assessment (EA) as the discussion below indicates.

### Current Status

The geologic setting within which this movement could occur is described in Section 2.1 and 3.2. The hydrologic conditions of the geologic setting are introduced in Sections 2.1 and described in Section 3.3. These discussions provide the reader with background information about the way water is thought to move in the vicinity of Yucca Mountain. They also provide background on the uses of ground water in the area.

### Site Characterization

The field activities required to obtain the data needed to make assessments about the migration of radionuclides in ground water are reviewed briefly in Section 4.1. Environmental impacts related to these activities are examined in Section 4.2.

### Repository

Locating a repository at Yucca Mountain must consider the impact on the physical environment in order to determine if the repository itself will affect the migration of radionuclides in ground water. Discussion relative to this topic is presented in Section 5.2.

### Siting Guidelines

The post closure system guidelines address the movement of radionuclides in ground water to enable a determination of the cumulative release of radionuclides to the accessible environment. This determination, which must be considered preliminary at this time, uses information about all of the post closure technical guidelines.

## Siting Guidelines (Continued)

Section 6.3.1.1 provides detailed information on the movement of ground water under the conditions which are expected to exist during the time period when radionuclide migration is of concern. This section of the draft EA describes what is known about past hydrologic processes in order to provide the basis for understanding the characteristics of the site that would minimize the amount of ground water that could contact the waste. Section 6.3.1.1 also describes a preliminary calculation of the expected time for water to move from the repository to the accessible environment.

Geochemical characteristics of the site, together with the hydrologic conditions, can act to prevent radionuclides from moving at the same velocity as the ground water. The geochemical characteristics of the Yucca Mountain site are described in Section 6.3.1.2. Possible changes in the characteristics of the rock surrounding the repository, due to the heat and radiation from the waste material, are discussed in Section 6.3.1.3. Climatic changes in the future, which could alter the time for ground water movement to the accessible environment, are discussed in Section 6.3.1.4. The possibility that erosion or tectonic activity could alter the site characteristics must be considered in an assessment of the time required for ground water to move from the repository to the accessible environment; such changes are discussed in Sections 6.3.1.5 and 6.3.1.7 respectively. Finally, the possibility of inadvertent intrusion at the repository site, most likely through exploitation of mineral or water resources, must be considered; the possibility of such exploitation is discussed in Section 6.3.1.8.

The preceding discussions of factors that could affect the migration of radionuclides must be considered together to assess the potential for radionuclide migration. An analysis that does this is known as a performance assessment and is used to assess the suitability of the site in terms of regulatory objectives. A proper performance assessment cannot be undertaken until site characterization is completed and the site behavior can be properly described by mathematical models.

## Siting Guidelines (Continued)

However, it is possible to perform a preliminary performance assessment based upon present knowledge and data, provided that the uncertainty and preliminary nature of the calculations are recognized. A preliminary calculation of this type for the Yucca Mountain site is described in Section 6.4.2. The results of the calculation are described and a preliminary comparison to regulatory performance objectives is presented. Finally, the section contains a qualitative discussion of how changes to expected conditions could affect the results of the calculation.

## **MINERAL RESOURCE POTENTIAL**

The topic of mineral resource potential is of concern because future generations could inadvertently encounter the repository during a search for mineral resources. The draft Environmental Assessment (EA) treats this topic; the following discussion indicates where this information can be found.

### **Current Status**

The results of a comprehensive survey of the energy and mineral resource potential of Yucca Mountain and surrounding areas are described in Section 3.2.4. The geologic setting within which these resources occur is described in Section 2.1 and Section 3.2.

### **Site Characterization**

During site characterization activities, information to supplement the comprehensive survey of energy and mineral resource potential could be obtained. The field activities which could lead to such data are described in Section 4.1. Environmental impacts related to these activities are examined in Section 4.2.

### **Repository**

No unique mineral resource potential has been identified in the Yucca Mountain area; thus the discussion on effects of locating a repository (Chapter 5) does not identify any problems associated with mineral resource potential.

### **Siting Guidelines**

The technical guideline on natural resources, which addresses concerns about the presence of mineral resources with potential for exploitation, is discussed in Section 6.3.1.8. This information is also used in the preliminary post closure performance assessment on compliance with regulatory requirements which is presented in Section 6.4.2.

## TOURISM

The tourism industry is a major source of revenue for the Las Vegas area, so information about potential effects of a repository on this primary sector of the economy is of significant importance. The draft Environmental Assessment (EA) considers this issue in the following manner.

### Current Status

Chapter 3 is a description of the existing environment of Yucca Mountain and surrounding region. Section 3.6.1 describes the current economic conditions in Clark and Nye counties, and discusses gaming and resort hotels as key components of the tourism-related economy.

### Site Characterization

Chapter 4 explains the potential impacts of site characterization activities on the physical and social environments in the vicinity of the proposed site.

### Repository

Chapter 5 is a discussion of effects on the environment from repository construction, operation, and decommissioning activities. Information on tourism is presented in Section 5.4.1.6. This section notes the significance of the tourism industry to Southern Nevada's economy, and considers the potential impact that negative public opinion about a repository could have on the resort economy.

### Siting Guidelines

Evaluations of socioeconomic issues against the Siting Guidelines are found in Chapter 6. Tourism is included in Sections 6.2.1.7 and 6.2.2.2, which discuss the applicable potentially adverse, favorable, qualifying, and disqualifying conditions.

## **TRANSPORTATION**

The transportation issue encompasses the potential impacts of increased traffic volume on area surface roads and railroads, and potential impacts due to the radioactive nature of the cargo. The issues and analyses relating to potential health effects of nuclear waste transportation have been selected for this example because of the expressed interest in this topic by the public.

### **Current Status**

Chapter 3 provides information about the existing transportation networks and the level of current use. Section 3.5.1 deals with the region's existing highway infrastructure, and includes statistics on the current use on those systems. Section 3.5.2 explains the current railroad infrastructure and its usage.

### **Site Characterization**

Chapter 4 provides a preliminary estimate of the effects on the environment of site characterization activities. Transportation of nuclear waste would not occur during site characterization, so this chapter need not be reviewed.

### **Repository**

Chapter 5 describes the potential regional and local impacts of repository construction, operation, and decommissioning activities. In order to assist the reader not familiar with radiological terminology and dose assessments, Section 5.2.9 includes definitions and describes overall radiological effects.

Section 5.3.2.1 explains the radiological effects of transporting high level nuclear waste. This section describes the types of waste that would be transported and the potential effects from accident-free operations, as well as impacts from accident scenarios. Finally, Section 5.4.4.3 describes general effects of repository operations on public attitudes and perception.

## Site Guidelines

The final element of this topic is the transport of high-level radioactive waste under the applicable Siting Guidelines. Section 6.2.1.8 of Chapter 6 lists the qualifying conditions for the transportation scenarios. Table 6.2.1.8-1 contains favorable, potentially adverse, qualifying and disqualifying conditions for transportation activities related to siting a repository at Yucca Mountain.

Section 6.2.2.2 discusses radiological safety relative to preclosure transportation activities. The region's transportation networks are evaluated against the guidelines to determine the suitability of the Yucca Mountain site with regard to transportation criteria.

## **IMPACTS OF WEAPONS TESTING ON SITE SUITABILITY**

The proximity of the Yucca Mountain site to other operations at the Nevada Test Site has led to a concern about the effects of weapons testing on the Yucca Mountain Site. There are two topics of concern discussed in the draft Environmental Assessment (EA): ground motion due to weapons tests and its effects on site suitability; and, the potential for releases of radionuclides from weapons tests in relation to possible releases from a repository.

### **Current Status**

The treatment of impacts of weapons test activities on site suitability is related to the concern about tectonic stability and expected ground motion. The background information on tectonic stability related to natural phenomena is presented in Section 2.1. A discussion on natural seismicity and the structural features of the site is presented in Section 3.2. Section 3.4 presents a radiological background information summary that addresses radiation levels and monitoring programs associated with Nevada Test Site activities.

### **Site Characterization**

The field activities required to obtain the data needed to make assessments about tectonic stability and expected ground motion are reviewed briefly in Section 4.1. Environmental impacts related to these activities are examined in Section 4.2.

### **Repository**

The design of a repository at Yucca Mountain must consider tectonic stability and expected ground motion. Chapter 5 examines radionuclide release scenarios which consider the effects of ground motion induced by weapons test activities.

## **Repository (continued)**

Preliminary assessments about worker and public radiological safety must consider not only possible release from the repository, but possible contributing releases from other sources such as, weapons test activities at the Nevada Test Site. Chapter 5 presents information based on preliminary concepts of normal operational releases and accidental releases during repository operation.

## **Siting Guidelines**

The offsite installations and operations technical guideline addresses the impacts of nearby activities on a repository. The discussion contained in Section 6.2.1.5 addresses ground motion expected at the Yucca Mountain site due to weapons test activity. This information is also used in the discussion of the preclosure radiological safety guideline, Section 6.2.2.1. The topic is further discussed in Section 6.3.3.4, preclosure tectonics, where natural and man-induced seismicity are evaluated.

The offsite installations and operations guidelines also discusses the topic of contributing releases due to offsite activities and presents a discussion of total releases due to both normal operations and contributing activities.