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NATIVE AMERICANS RESPOND TO THE TRANSPORTATION OF LOW LEVEL RADIOACTIVE WASTE TO THE NEVADA TEST SITE

Bureau of Applied Research in Anthropology
The University of Arizona, Tucson

September 1998

BARA

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Native Americans Respond to the Transportation of Low Level Radioactive Waste to the Nevada Test Site

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September 1998

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ACRONYMS

AITC	American Indian Transportation Committee
ATV	All Terrain Vehicles
BARA	Bureau of Applied. Research in Anthropology (University of Arizona)
BIA	Bureau of Indian Affairs
CFR	Code of Federal Regulations
CGTO	Consolidated Group of Tribes and Organizations
CRIT	Colorado River Indian Tribes
DEIS	Draft Environmental Impact Statement
DOE	Department of Energy
DOE/NV	Department of Energy, Nevada Operations Office
DOT	Department of Transportation
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
HAZMAT	Hazardous Materials
ICC	Indian Claims Commission
INEL	Idaho National Engineering Laboratories
LLRW	Low Level Radioactive Waste
LVIC	Las Vegas Indian Center
NAGPRA	Native American Graves Protection and Repatriation Act
NCAI	National Congress of American Indians
NRMNC	Nuclear Risk Management for Native Communities
NTS	Nevada Test Site
PITU	Paiute Indian Tribes of Utah
SEDS	Social and Economic Development Strategies
WSNC	Western Shoshone National Council

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We are very grateful to the members of the American Indian Transportation Committee for their efforts and persistence in seeing this project through to the end. We also thank the Native American tribal governments, personnel, and all of the Indian people who participated in the interviews that provided much of the data for this report, furnished information about tribal travel, and reviewed draft versions of the report. Without their willingness to share what they know and understand, this study could not have been done.

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PREFACE

This study is about the impacts of the transportation of low level radioactive waste (LLRW) on *American Indians*. The terms American Indians, Native Americans, and Indians are used interchangeably throughout this report to refer to people who are members of tribes in the United States. The information contained in this report is valuable to non-Indian individuals, communities, and governments as well as to the tribes and the U.S. Department of Energy/Nevada Operations Office (DOE/NV) for which it was prepared. Many of the individuals who agreed to participate in this study asked if their non-Indian neighbors were also being given the opportunity to share their views and perspectives on the transportation of LLRW near and through their neighborhoods. Although this study was designed to include only Native Americans, it can serve as a model for additional studies in non-Indian communities. American Indian tribes have a unique status as sovereign nations within the U.S., and this study was designed to address that relationship. The most recent official affirmation of their special relationship with the U.S. federal government is the April 29, 1994 Presidential Memorandum for the Heads of Executive Departments and Agencies, *Government-to-Government Relations with Native American Tribal Governments*. That memorandum outlines principles for executive departments and agencies to follow in their interactions with Native American tribal governments in order to clarify the federal responsibility in the relationships.

This study is an American Indian study for three reasons:

1. American Indians were involved in all phases of the research - design, data collection, analysis, and write-up;
2. the focus is on transportation *by* American Indians and *across* Indian land;
3. the study was designed to consider *individual*, *social*, and *cultural* impacts.

It can serve as a model of a uniquely collaborative arrangement among a federal agency, tribes, and researchers. The study nevertheless involves only a select group of American Indians and therefore reflects the values, knowledge, and views of the involved tribes.

This study includes an assessment of social and cultural impacts. One type of impact assessment concerns the estimation and communication of risks associated with potentially dangerous technologies or substances. Such an assessment, a technological "risk assessment," is generally conducted by natural or physical scientists and focuses on the probability and magnitude of various scenarios through time (Wolfe 1988). The specialists who conduct the assessment believe their estimates reflect the "real risks" of a technology or project because the estimates were made using scientific calculations. This study is not a risk assessment. Instead, this study pays attention to the *public perceptions* of impacts and risks. Like other social scientists, the researchers and American Indian partners who designed and conducted this study focus on public perceptions and frame the discussions in terms of locally defined values and concerns. Recent studies show that public response is rational, but it is based on factors different than those used in technological calculations of risk (Kraft and Clary 1988, Freudenburg 1988,

Shrader-Frechette 1985, 1988). Instead of being irrational or fearful, as many technology specialists often assert, public perceptions of impacts and risk can result from concrete and complex sociocultural issues that go beyond mathematical calculations of the probabilities and magnitudes of alternative outcomes. The American Indians who participated in this study displayed varying levels of knowledge of radioactive materials. All of them, however, are knowledgeable about their tribes, their communities, and the things they have experienced. Because of that, they provide a window into the complexity of the issues surrounding the transportation of LLRW across and near tribal lands.

This study involves 29 tribes and subgroups and is therefore very complex. Every effort has been made to present information systematically to help the reader make sense of what is being presented. Information about the tribes is presented in the same order throughout the report. References to other chapters are made wherever possible to help the reader make connections and relate one piece of information to another. It is the authors' hope that the information contained herein both informs and causes the reader to pause and reflect on the experiences and concerns of the participating tribes.

CHAPTER ONE: INTRODUCTION

Diane Austin

This report of the American Indian Low Level Radioactive Waste Transportation Study (American Indian Transportation Study) is the product of almost two years of work. It is one of many efforts of the Department of Energy/ Nevada Operations Office (DOE/NV) to recognize and respond to the special and unique legal and political relationship that American Indian Tribal governments have with the United States federal government. The first section of this introduction highlights U.S. government laws and policies that define that relationship. The second section provides the background for the Transportation Study. The third section outlines the remainder of this report.

American Indian Policy Within the Department of Energy

The U.S. federal government has a trust responsibility to American Indian Nations as set forth in treaties, congressional statutes, presidential and executive orders, and court decisions. Legal title to all lands reserved to Indian Nations is held by the U.S., and under this responsibility tribes and their land must be protected. The only legislative power explicitly granted to Congress under the U.S. Constitution is the Commerce Clause (Article 1, Section 8) which regulates commerce with Indian tribes. The constitutional provision creates federal preemption over tribes and exempts them from state taxation and regulation. Congress may enact special legislation favoring Native Americans without violating the principles and laws of equal protection of all citizens because such legislation is based on government-to-government relationships and not on race (Wilkinson 1987). The most recent official affirmation of those relationships is the April 29, 1994 Presidential Memorandum for the Heads of Executive Departments and Agencies, *Government-to-Government Relations with Native American Tribal Governments.* That memorandum outlines principles for executive departments and agencies to follow in their interactions with Native American tribal governments in order to clarify the federal responsibility in the relationships (see Appendix A).

As a U.S. federal agency, the Department of Energy (DOE) must follow federal policy, treaties, and law to ensure that the rights and interests of federally-recognized American Indian Tribes are identified and considered in pertinent decision making. The DOE has adopted its own American Indian Policy (DOE Order 1230.2, see Appendix B). In addition to a commitment to consultation with appropriate American Indian tribal governments, the DOE policy states that the agency will identify and seek to remove impediments to working directly and effectively with tribal governments on DOE programs. This American Indian Transportation Study represents one effort by the DOE/NV to fulfill that responsibility.

Background of the Study

On August 10, 1994, the U.S. DOE published a Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Nevada Test Site (NTS) and other off-site test locations within the state of Nevada. A Draft Implementation Plan that documents DOE's approach for preparing the Final EIS was prepared in February 1995. It was stated in the Implementation Plan that DOE would consult with American Indian tribes in accordance with DOE Order 1230.2, American Indian Tribal Government Policy, and that tribal concerns would be identified through direct consultation with tribal representatives. The DOE Nevada Operations Office (DOE/NV) consulted with tribal representatives regarding the preparation of the NTS-EIS through the Consolidated Group of Tribes and Organizations (CGTO). The CGTO is composed of 17 tribes and three official Indian organizations from Arizona, California, Nevada, and Utah that have cultural or historic ties to the NTS. The CGTO establishes subgroups, made of up members of the CGTO tribes and organizations, to work directly with DOE personnel in response to specific projects that arise. For example, a subgroup was created to help the DOE/NV comply with the Native American Graves Protection and Repatriation Act (NAGPRA). Similarly, a six member American Indian Writers Subgroup was created to write the Native American text for the NTS-EIS.

The Draft EIS (DEIS) for the NTS was issued in January 1996. Volume 1, Appendix 1 of the DEIS is a Transportation Study. In April 1996, the CGTO responded to the DEIS in the document entitled *American Indian Assessments of the Environmental Impact Statement for Nevada Test Site And Off-Site Locations in the State of Nevada: A Native American Resource Document* (American Indian Writers Subgroup, 1996). One section of the CGTO response was a criticism of the DEIS Transportation Study because of its failure to identify and address the concerns of American Indian tribes. The Final EIS was released in August 1996, the Record of Decision was released on November 9, 1996, and the Mitigation Action Plan was issued on February 28, 1997. The Record of Decision directs the DOE/NV to conduct a comprehensive Native American transportation study. The Mitigation Action Plan, which outlines activities to be completed by the DOE/NV in response to the Record of Decision, includes a timeline for this study.

DOE/NV contracted with the Bureau of Applied Research in Anthropology (BARA) at the University of Arizona to conduct a comprehensive American Indian transportation study. The purpose of the study is to investigate the potential social and cultural impacts to Native Americans that could occur as a result of transporting Low Level Radioactive Waste (LLRW) over three highway routes that were defined in the DEIS as potential LLRW transportation corridors. The study is restricted to American Indians who currently reside in the vicinity of these three transportation routes (Figure 1.1).

In its design and focus, this is a study of *perceived risk*. It is not a probabilistic risk assessment, where the intent is to calculate the mathematical likelihood of accident, death, or disease resulting from the transportation of LLRW. Instead, this study aims to characterize the social and cultural environments of the participating tribes and, within that context, describe

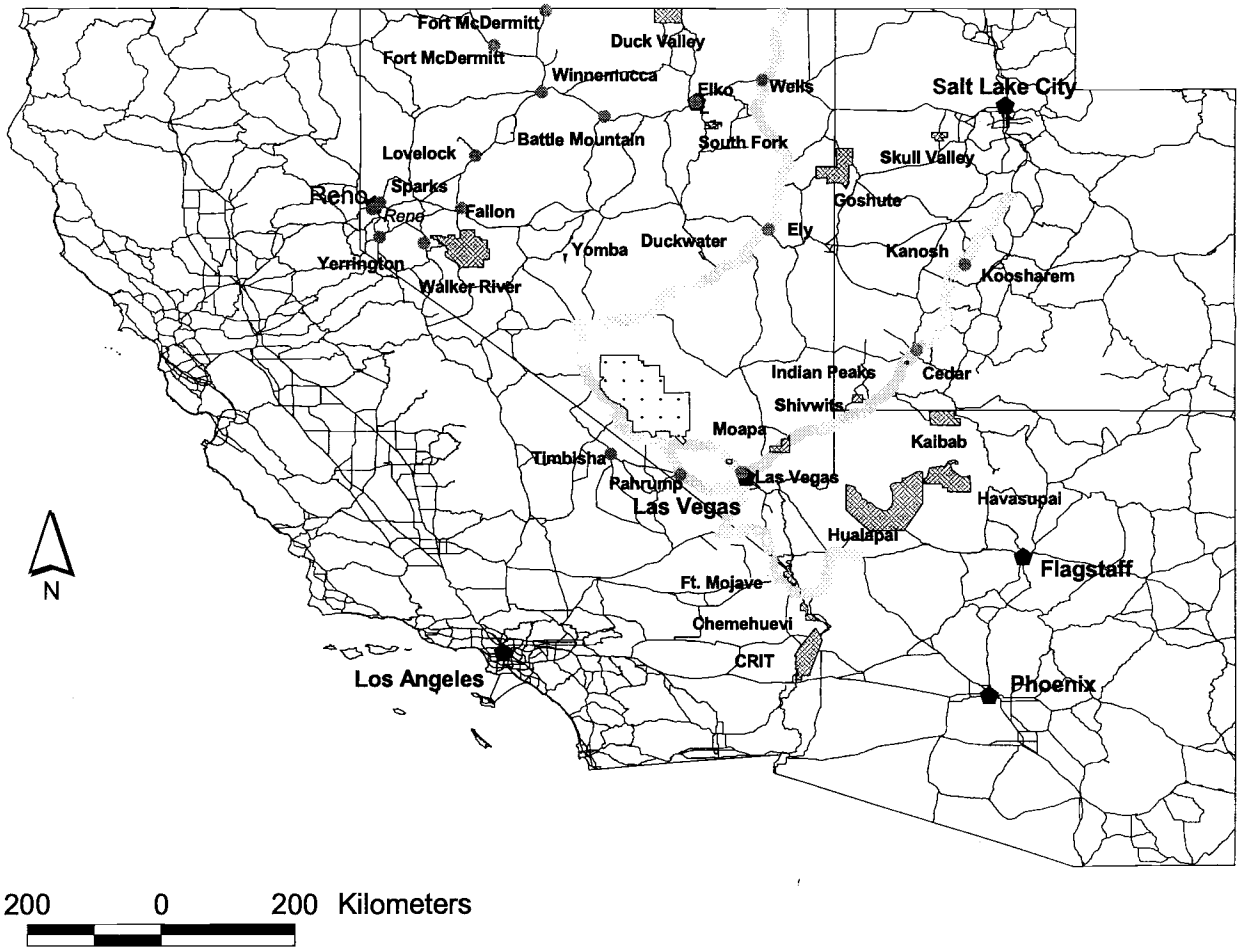


Figure 1.1 Location of Three Proposed Routes Included in this Study

what tribal members perceive to be the potential consequences to themselves, their families, and their tribes of the transportation of LLRW across and near their land. In addition, this study aims to provide information to the DOE/NV and the participating tribes about the issues, such as jurisdiction, that require further attention.

Creation of the American Indian Transportation Committee

The American Indian Transportation Study is the first of its kind and necessitates an innovative approach. Thus, the study proposal included the creation of a ten member American Indian Transportation Committee (AITC). The AITC members represent the tribes and ethnic groups that are included in the American Indian Transportation Study. Five members of the AITC are members of the American Indian Writers Subgroup of the CGTO. According to the proposal, the remaining five members were to be selected to ensure that tribes that are not members of the CGTO were represented on the AITC. Representatives of the Shoshone-Paiute, Goshute, and Mohave ethnic groups were identified by the tribes with members from these groups. The tenth position was reserved for a member of one of the Te-Moak Bands of the Western Shoshone Indians. Unfortunately, due to repeated difficulty establishing contact with that tribe in the early stages of the study, no Te-Moak representative was appointed to the committee. The Western Shoshone already on the committee served as the point of contact for the Te-Moak Tribe throughout the study. After the study commenced, the Paiute Indian Tribe of Utah requested that the tribe's cultural resources advisor receive copies of all committee correspondence so he could keep the five Paiute bands in Utah informed of the progress of the study. That request was met.

An AITC meeting was held on August 6-7, 1996 in Las Vegas, Nevada to finalize the American Indian Transportation Study design, including the identification of the tribes to be included in the study, and to present the proposed methods for collecting information. Before the meeting was held, copies of the American Indian Transportation Study proposal were mailed to the members of the American Indian Writers Subgroup. By the date of the meeting, only seven of the ten AITC members had been appointed. Only three of those seven AITC members were present at the meeting. A second meeting of the AITC was held September 27-28, 1996 in Tonopah, Nevada. By the date of the meeting, nine AITC members had been appointed, and seven of those nine individuals were present at the meeting. The AITC members, their tribes and the groups for which they served as a point of contact are shown in Table 1.1.

The results of the first two AITC meetings were summarized in a report, *American Indian Low Level Radioactive Waste Transportation Study: Summary of Meetings of American Indian Transportation Committee, August 6-7, 1996 and September 27-28, 1996* (Austin and Stoffle 1996). The study design and methods were finalized at those meetings, as described in Chapter Two. At that time, the study was divided into two phases.

Table 1.1 AITC Members and the Tribes for Which They Served as Point of Contact

AITC Member	Tribe	Ethnic Group/Organization for which served as Point of Contact
Richard Arnold	Pahrump Paiute Tribe	Southern Paiute
Elliot Booth	Colorado River Indian Tribes	Mohave
Don Cloquet	Las Vegas Indian Center	Indian Center
Betty Cornelius	Colorado River Indian Tribes	Southern Paiute
Maurice Frank	Yomba Shoshone Tribe	Western Shoshone
Milton Hooper	Confederated Tribes of the Goshute Reservation	Goshute
Ted Howard	Shoshone-Paiute Tribe of the Duck Valley Reservation	Shoshone-Paiute
Calvin Meyers	Moapa Paiute Indian Tribe	Southern Paiute
Gaylene Moose	Big Pine Paiute Tribe	Panamint Shoshone

The AITC held another meeting on August 20, 1997 to review preliminary results of Phase One of the American Indian Transportation Study and prepare for a meeting with representatives of all participating tribes and tribal subgroups on August 21-22, 1997. All nine members of the AITC were present at the August 20 meeting. The results of that meeting and the meeting for all participating tribes are summarized in a report, *American Indian Low Level Radioactive Waste Transportation Study: Summary of Interim Project* (Austin, Fish, Shamir, and Stewart 1997). When the participating tribes were presented with the preliminary findings of the study at the interim project meeting, they suggested several additional tasks to be included in Phase One. These tasks included a survey of tribally sponsored transportation and a more thorough assessment of environmental impacts facing the participating tribes. These tasks were identified as Phase One Supplemental Tasks and necessitated renewed contacts with the tribes to gather the additional information.

Collaborating on the Study Design

During the planning phase, two aspects of the Phase One Transportation Study design received considerable attention: (1) the identification of tribes to participate in the study; and (2) the selection of methods to be used with and questions to be asked of study participants. Three criteria were established for tribes participating in the study (see Chapter Two). The decision about which tribes to include in this study was a difficult one that occupied much of the planning meetings at which members of the AITC, researchers from BARA, and representatives of the DOE/NV were present. The desire to be as inclusive as possible had to be balanced with the need to conduct the study within a reasonable period of time and with a limited budget. The DOE/NV, as project sponsor, was concerned that the study give ample attention to the tribes within the state

of Nevada that were on or near three routes that were most likely to be selected for transporting the waste to the NTS. The AITC members emphasized that the study should include all tribes who were members of the ethnic groups across whose aboriginal land the proposed routes passed. After much deliberation and review by the DOE/NV, a list of tribes who would be invited to participate in the study was generated. The list and schedule of visits is described in detail in Chapter Two.

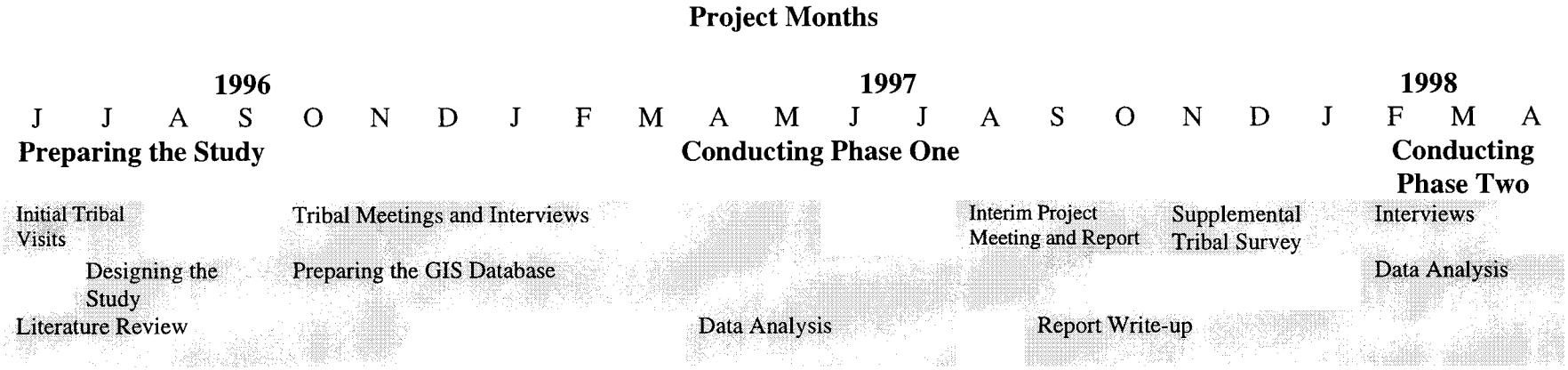
Presentations were made regarding Phase Two of the Transportation Study at each planning meeting. Plans for Phase Two were also reviewed during the August 1997 interim project meetings. No changes were made in the Phase Two methodology.

The American Indian Transportation Study was initially designed to be completed in one year. However, the complexities of contacting and arranging visits to twenty-eight tribes and tribal subgroups caused the project to need to be extended an extra six months. The overall study timeline is shown in Figure 1.2. In addition to the initially proposed activities, the additional tasks required more time to complete.

Outline of the Report

This report is organized into eight chapters to meet the needs of the DOE/NV and the participating tribal governments. Chapter Two presents the methodology that was created for gathering and analyzing the information used in the study. Chapter Three provides a brief background on the 28 tribes and tribal subgroups that were invited to participate in the study. It includes an introduction to the ethnic groups whose traditional territories are crossed by any of the three proposed routes for transporting LLRW to the NTS, and a description of other environmental impacts that are facing the participating tribes. Chapter Four presents an overview of the results from the study and establishes a basis for further involvement by the participating tribes in decisions regarding transportation within the study area. Chapter Five provides a discussion of the major concerns raised by tribal members regarding the transportation of LLRW along the proposed routes, the links between concerns and experiences, and ideas about mitigation of those concerns. A more in-depth discussion of one particular concern, issues related to jurisdiction along the proposed routes, is provided in Chapter Six. Finally, Chapter Seven responds to the questions most frequently asked by tribal members during the interviews, focus groups, and meetings that were conducted as part of this study.

Figure 1.2. American Indian Transportation Study Timeline



CHAPTER TWO: METHODOLOGY

Diane Austin

This American Indian Low Level Radioactive Waste Transportation Study (American Indian Transportation Study) is the first of its kind. Researchers, tribal representatives, and agency personnel were required to develop a unique methodology for the study. Three major issues were central to the development of the methodology: (1) the need to involve a large number of tribes; (2) the need to collect systematic information about each tribe while maintaining flexibility to incorporate tribal and location specific concerns; and (3) the need to differentiate the issues of low level radioactive waste transportation from the myriad of other Department of Energy (DOE) and waste transportation issues the tribes were facing. Due to the complexity of the research process and the participation of 27 tribes and tribal subgroups, the activities described below did not occur in a linear stepwise fashion. Instead, these activities were carried out as needed, often simultaneously (see Figure 1.2).

Preparing the Study

The American Indian Transportation Committee and Planning Team

The American Indian Transportation Study was requested by members of the American Indian Writers Subgroup of the Consolidated Group of Tribes and Organizations (CGTO) who had been involved in the Environmental Impact Statement (EIS) for the Nevada Test Site (NTS; see Chapter One). Several members of that subgroup formed the core of what became the American Indian Transportation Committee (AITC). The AITC, researchers from the Bureau of Applied Research in Anthropology (BARA) at the University of Arizona, and a representative from the DOE Nevada Operations Office (DOE/NV) constituted the study planning team.

The Identification of Study Participants

The planning team determined that each of the following three criteria must be met by each of the tribes invited to participate in the study:

1. have aboriginal and/or historical cultural affiliation to the lands along any of the three proposed routes;
2. be located near any of the three proposed routes in the vicinity of Nevada;
3. have tribal members who frequently use the proposed routes.

After much discussion, 28 tribes and tribal subgroups were invited to participate in the study (see Austin and Stoffle 1996). Several composite tribes, consisting of former distinct groups that were consolidated by the U.S. government at some point in their history, were included in the study. Each subgroup of the composite tribes, the Shoshone-Paiute Tribes of the Duck Valley Reservation, the Paiute Indian Tribe of Utah, and the

Colorado River Indian Tribes, was treated as a separate group for the purpose of this study. Those tribes and the locations of their reservations relative to the proposed transportation routes are listed in Table 2.1 and shown in Figure 2.1.

In addition to the 28 tribes and subgroups, the Las Vegas Indian Center was contacted to participate in the study. One of the proposed routes runs through the middle of Las Vegas, and the Indian Center has actively participated in the Consolidated Group of Tribes and Organizations, so the planning team determined that Native Americans living in Las Vegas should have the opportunity to express their views. With the Las Vegas Indian Center, 29 tribes and subgroups were invited to participate in the study. Several members of the Western Shoshone National Council (WSNC) also participated in the Study. The WSNC is a tribal organization created to represent Western Shoshone peoples and lands, especially those which fall outside the boundaries of any reservation. Because the individuals were also members of the participating tribes, the WSNC is not counted for this study as a separate tribal group.

The AITC members then identified tribes with which they had relationships and for which they could serve as points of contact for the American Indian Transportation Study. At least one AITC point of contact was identified for each tribe (see Table 1.1 for the ethnic groups to which the AITC members served as points of contact).

Table 2.1. Tribes and Groups Invited to Participate in the American Indian Transportation Study

Ethnic Group/ Tribe/ *Subgroup*	**Ethnic Group/** Tribe/ *Subgroup*	**Ethnic Group/** Tribe/ *Subgroup*
Western Shoshone	**Southern Paiute**	**Goshute**
Te-Moak Band of Western Shoshone Indians	Paiute Indian Tribe of Utah	Confederate Tribe of the Goshute Reservation
Battle Mountain Band	*Shivwits Band*	Skull Valley Goshute Tribe
Elko Band	*Cedar City Band*	**Mohave**
South Fork Band	*Indian Peaks Band*	Colorado River Indian Tribes - Mohave
Wells Band	*Kanosh Band*	Fort Mojave Tribe
Ely Shoshone Tribe	*Koosharem Band*	**Other**
Yomba Shoshone Tribe	Kaibab Band of Paiute Indians	Colorado River Indian Tribes - Hopi
Duckwater Shoshone Tribe	Las Vegas Paiute Tribe	Colorado River Indian Tribes - Navajo
Timbisha Shoshone Tribe (Panamint Shoshone)	Pahrump Paiute Tribe	Las Vegas Indian Center
Shoshone-Paiute Tribe of the Duck Valley Reservation	Moapa Band of Paiute Indians	
	Chemehuevi Paiute Tribe	
	Colorado River Indian Tribes - Chemehuevi	

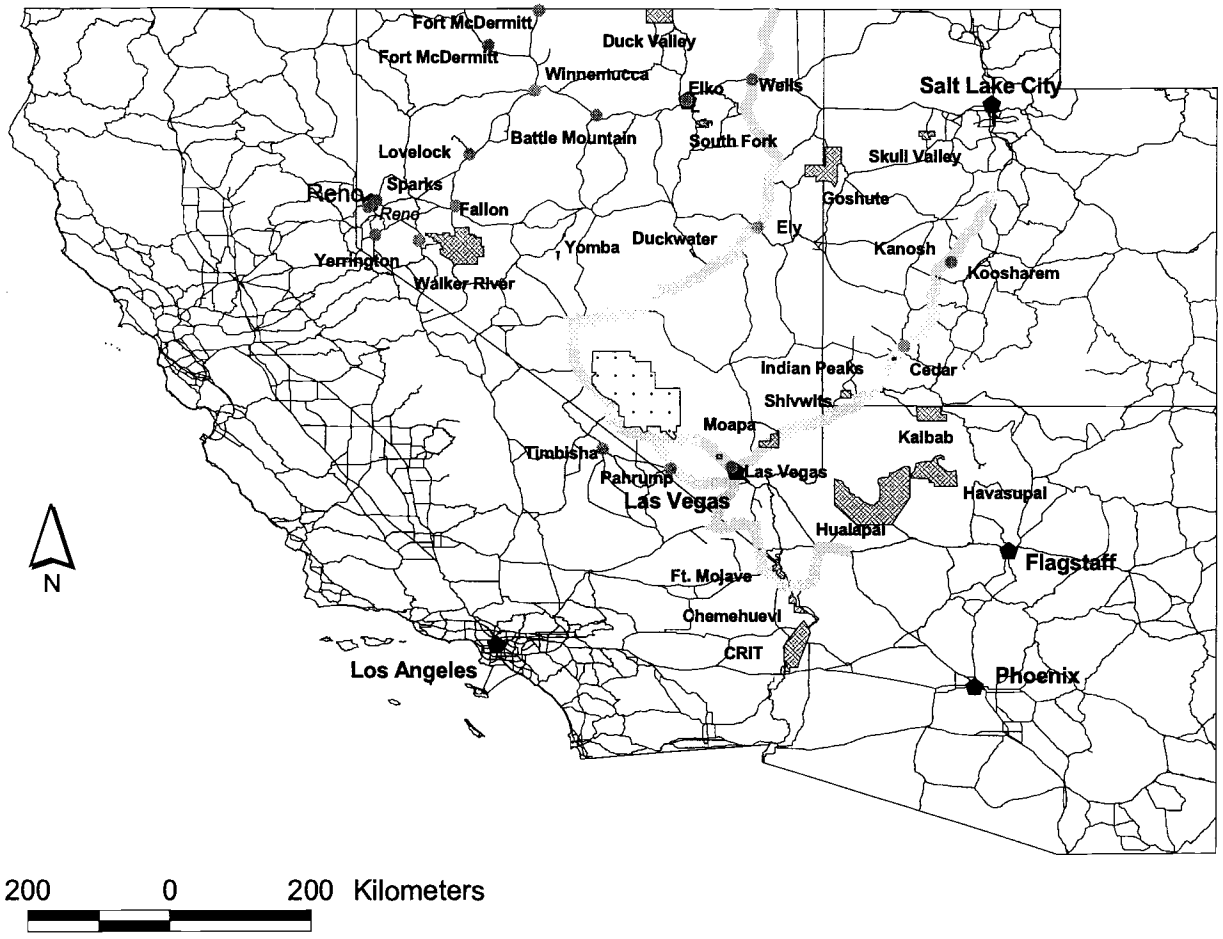


Figure 2.1 Location of Tribes Invited to Participate in the American Indian Transportation Study

Tribal Visits and Interviews

The tribes were notified of the American Indian Transportation Study by a letter sent from the DOE/NV (see Appendix C). After the initial written contact, the tribes were contacted by phone and in person by the AITC members and/or BARA researchers. In addition, when requested, study team members made formal presentations to tribal governments to explain the study. BARA researchers sent a confirmation letter to the participating tribes and suggested dates for the tribal visits and interviews.

The governments of each tribe invited to participate in the study then determined the nature and extent of their tribe's participation. For example, the tribal governments determined which of their subgroups, such as bands or colonies, would participate in the study. Each tribal government was then asked to identify approximately six individuals from the tribe or each subgroup to participate in the study. The research team suggested that the individuals represent a range of perspectives on the transportation of LLRW, be of different ages from young adults to elders, and include both males and females. The tribal governments generally appointed a point of contact within the tribe who helped the study team identify participants and set up interviews. The Las Vegas Indian Center informed individuals of the study and identified those who wanted to participate.

Literature Review

The American Indian Transportation Study was conducted to address a deficit in the NTS Transportation Study (see Chapter One). The study was funded as the first to examine a broad range of potential impacts to Native Americans from the DOE's transportation of low level radioactive waste across and near tribal land en route to the NTS. A brief literature review was conducted prior to the beginning of the study. As the study progressed, content and organization of this report evolved to meet the needs of both the DOE and the participating tribes. For example, Chapters Six: "Jurisdictional Issues" and Seven: "Questions Raised by Participants" were included to address questions frequently asked by tribal members during Phase One. With the addition of these chapters, new efforts were made to review the relevant literature. Finally, whenever possible, current periodicals, especially local newspapers, were searched for articles relating to the local issues and concerns raised by study participants.

The focus of the literature review included: (1) culture and history of the involved tribes; (2) approaches to the study of impacts of radioactive and other hazardous materials transportation; (3) other environmental impacts to the participating tribes; (4) jurisdictional issues related to transportation across tribal land; and (5) radiation, radioactivity, and the Nevada Test Site. Materials were collected at the main and law libraries of the University of Arizona, the main and special collections libraries of the University of Nevada Las Vegas, the University of Utah, and Southern Utah University, and the archives and files of the involved tribes and project researchers. Those reviewed include books, reports, academic journal articles, popular magazine articles, newspapers,

and fliers. Responses to some of the questions raised by interviewees were provided by DOE/NV employees.

Study Design

Phase One

The American Indian Transportation Study required the development of specialized interview materials. At both AITC meetings held in 1996, BARA researchers presented a proposed methodology for collecting information about the potential social and cultural impacts to American Indians that could occur as a result of transporting low level radioactive waste over the proposed routes to the NTS. At these meetings, the American Indian participants participated in a pilot interview and helped to further develop the study methodology. Based on suggestions from the AITC, the Phase One interviews were adapted to include three parts: (1) participants identify their travel routes and hunting and gathering areas; (2) interviewers show participants the proposed routes and provide information about the transportation of low level radioactive waste; and (3) participants describe what they perceive to be the social and cultural impacts to themselves and their tribes that could occur as a result of transporting low level radioactive waste to the NTS along the proposed routes.

First, to aid in data collection and analysis, maps of the study were generated by the BARA researchers using *ArcInfo* and *ArcView*, two Geographic Information Systems (GIS) software packages (see Figure 2.2). AITC members helped the BARA researchers identify key landmarks that should be included on the maps because of their importance to the participating tribes. Local names for those landmarks, such as the "Pony Express Trail," were included on the map where appropriate (see Figure 2.3). The maps were prepared so each study participant would have a fresh map upon which to identify roads and areas of concern.

Figure 2.2. BARA researcher and AITC member review transportation study map

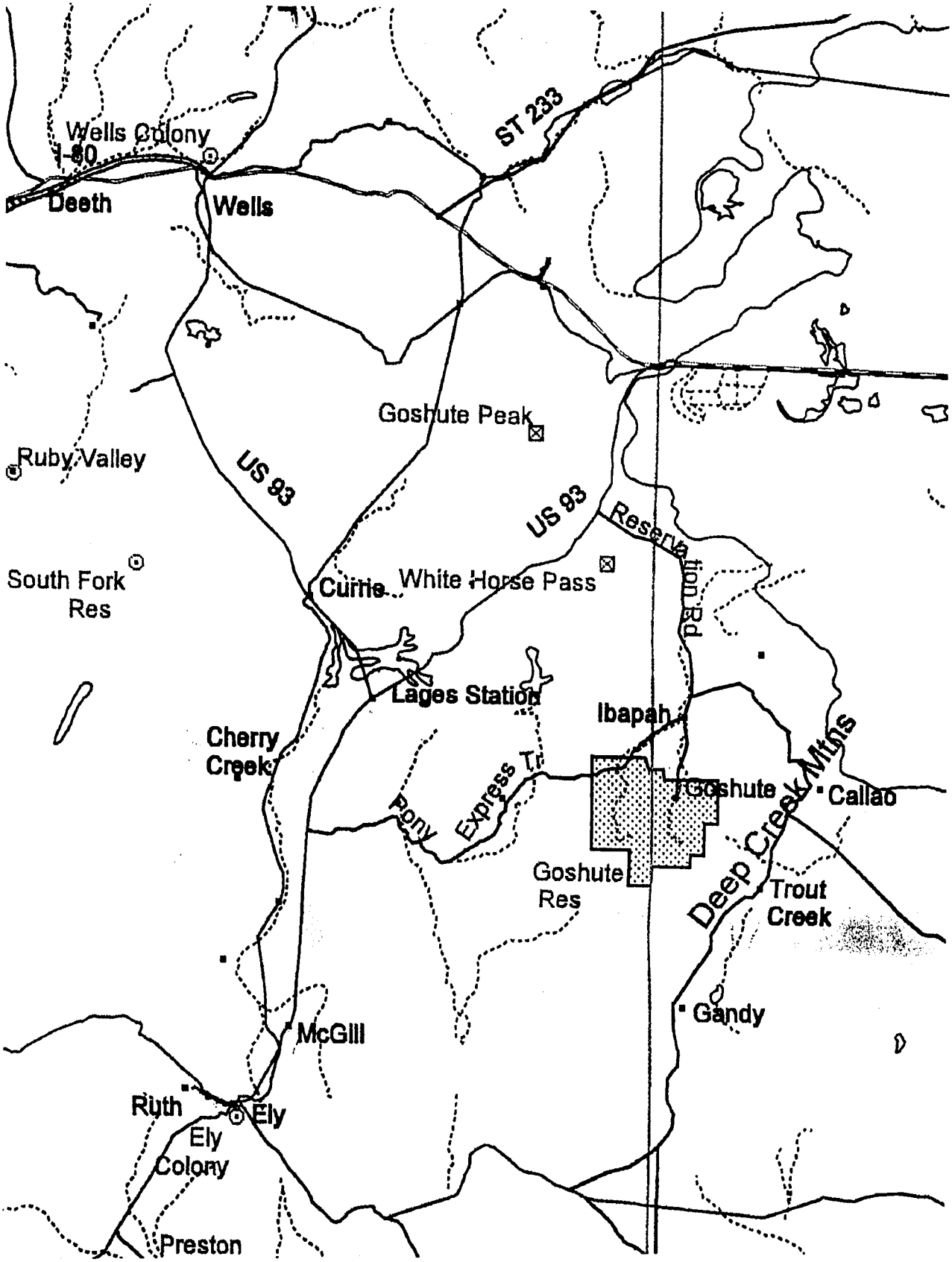


Figure 2.3. Section of Transportation Study map showing local names for landmarks and routes

Second, to ensure that participants were aware that the study was concerned with *low level radioactive waste* transportation, a notebook of photographs and maps was prepared to be shown to each study participant. Materials were obtained from the DOE/NV for inclusion in the notebook and included photographs of types of low level radioactive waste, trucks used to transport radioactive waste to the NTS, the radioactive waste storage facilities at the NTS, and maps showing DOE facilities approved to ship waste to the NTS (see Appendix D).

Third, to ensure that participants would focus their discussion of potential impacts on the proposed transportation routes, notebooks were prepared with photographs taken at approximately ten mile intervals along the routes. BARA researchers drove along each of the routes shown in Figure 2.1. The researchers stopped every ten miles to take photographs in each of four directions, usually north, east, south, and west, and to record the locations in a photo log. The photographs were then organized in a notebook, with individual maps identifying the location at which each set of photographs was taken (see Figure 2.4).

Finally, interview questions were developed and pilot tested. First, AITC members participated in pilot interviews during the study planning meetings (see Austin and Stoffle 1996). They recommended several revisions to the interview questions and procedures. These included the wording of the introduction and the explanation of radioactive waste, the addition of a question about the total miles traveled by the individual in a single year, and modification of the consent form to allow tribal leaders to determine if they wanted to receive copies of the interviews conducted with their members. Next, the interview was pilot tested with individuals unfamiliar with the study and questions were revised as needed to improve clarity. The project description and consent form are provided in Appendix E. The interview questions are included in Appendix F.

Phase One - Supplemental Tribal Survey

At the interim project meeting on August 20, 1997, AITC members and tribal representatives made a series of suggestions for expanding the Transportation Study. One of the committee's recommendations was that additional data be gathered to measure the mileage and use of official tribal vehicles. While the initial survey gathered data on individual tribal patterns, the committee pointed out that tribal vehicles are numerous, in nearly constant use, and vital to the administration of tribes and bands. Among other things, liability issues are different for tribal than for personal vehicles. The Tribal Travel Survey, then, sought to gather specific information from tribal administrators on the number and type of vehicles operated by the participating tribes, the number of trips per vehicle each year, and the average number of individuals riding in the vehicles. A brief form was designed and implemented by BARA in conjunction with several AITC members (see Appendix G). All participating tribes were contacted by mail, and BARA researchers followed up the mailing with a phone call. Several participating tribes returned the forms by fax. The remaining tribes and bands were visited in a brief

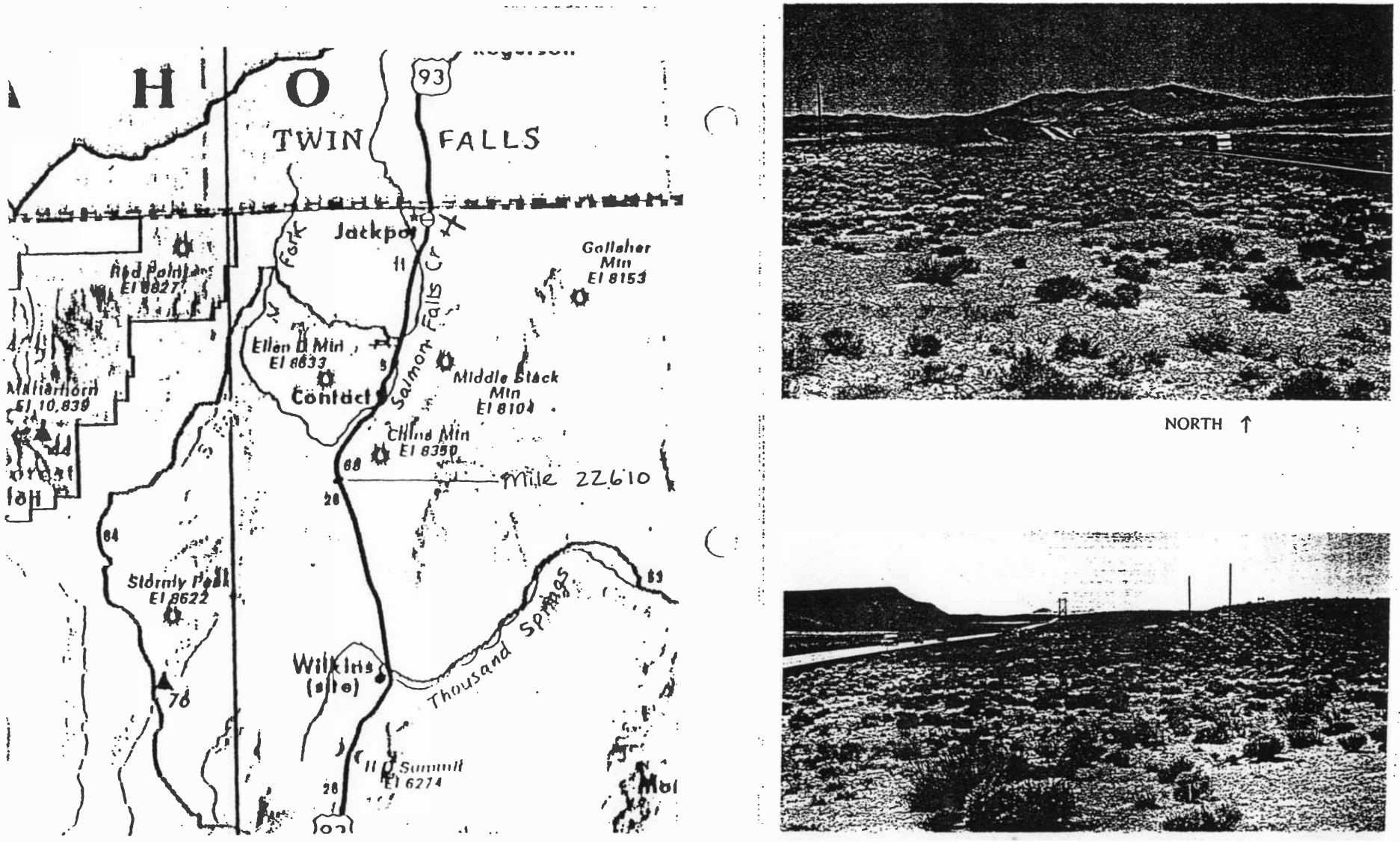


Figure 2.4. Example of a Locator Map and Photos Used to Show Route to Participants

fieldwork session stretching from January 5 to January 13, 1998. Only those participating tribes and bands administering vehicles were contacted for this portion of the study. Of those eighteen tribal administrations, 13 provided data, either by sending in a response or during a visit with BARA researchers.

The fieldwork session also provided an opportunity to gather data on additional environmental threats facing tribal administrations. The desire for such information also was expressed during the interim project meeting on August 20. AITC members and tribal representatives suggested that data be gathered to help contextualize the transportation of low-level radioactive waste in the larger spectrum of environmental and ecological pressures that face the participating tribes. A second brief form was designed to gather this information (see Appendix H). Tribal leaders, environmental administrators, or designees were interviewed regarding the past, present, and perceived future effect of other threatening activities.

A significant portion of the Western Shoshone tribes and bands experienced changes in leadership during the time between the initial Phase One field session and the Supplemental Tribal Survey. Beyond gathering data on tribal vehicles, the fieldwork session provided an opportunity for the researchers to meet with new tribal administrations, explain the study, and answer questions. These meetings proved essential in maintaining the trajectory of the study over periodic changes in leadership. All of the tribes and bands visited expressed interest in continuing their participation in the study.

Phase Two

Phase Two involved conducting in-depth interviews with selected tribal members from the tribes associated with the study. The individuals were selected in consultation with their tribal governments and with the assistance of the American Indian Transportation Committee members. The purpose of the interviews is to explore more fully various aspects of Indian culture and the transportation of LLRW. The issues discussed derived from the Phase One interviews.

Conducting the Study

For each participating tribe, at least one BARA researcher and one member of the AITC were designated to visit the tribe and conduct interviews. Dr. Diane Austin visited every participating tribe and conducted most of the Phase One interviews. This helped to ensure that the interview procedure was replicated at each location. The AITC members were responsible for from one to seven tribes and subgroups, based upon their relationships with the participating tribes. The AITC members helped (1) establish contacts with the tribes, (2) explain the study to tribal governments and members, (3) contact potential interviewees, and (4) conduct interviews, as needed. Their participation was critical to the ability of BARA researchers to make contacts with all participating tribes and complete the phase one interviews in an eight month period.

During field visits, information for the study was collected in three ways: (1) meetings with tribal officials, administrators, and other employees; (2) interviews with tribal members and designees; and (3) participation in tribal activities and events. In addition, where possible, study team members visited local libraries to collect newspaper articles about events named by study participants. Information gained from one source was combined with that from the others to ensure that study team members developed an accurate understanding of the potential impacts of the proposed transportation of low level radioactive waste on American Indians in the study area.

Meetings with Tribal Governments

Each tribal administration was asked to provide demographic information about the tribe and reservation, information about existing and proposed economic development projects that are near or might be affected by the proposed transportation activities, and existing or proposed activities that are perceived to be impacting the environment and/or tribal members. In addition, the tribes were asked to provide researchers with copies of tribal environmental codes and policies.

Phase One Interviews with Tribal Members and Designees

Each person who agreed to participate in the study was interviewed individually or in the presence of an individual of his or her choice, such as a spouse or a child. The interviews were divided into three parts:

1. Study participants were asked to describe their road travel in the study area. They were given maps of the area (see Figures 2.2 and 2.3) and asked to mark the roads they or members of their immediate family use for travel in a typical year. They were also asked to indicate areas they or members of their immediate family use for hunting, gathering, fishing, and trapping.
2. Study participants were centered on the topic of the transportation of low level radioactive waste along the proposed transportation routes. They were shown pictures of types of low level radioactive waste, trucks used to transport waste to the NTS, the radioactive waste storage facilities at the NTS, and maps showing DOE facilities approved to ship waste to the NTS (see Appendix D). They were also shown the proposed transportation routes.
3. Study participants were asked to describe any impacts (positive, negative, and/or neutral) that they, their family, and their tribe were experiencing or might experience from trucks carrying low level radioactive waste along the proposed routes. They were asked to describe any experiences that had led them to identify those impacts.

Participation in Tribal Activities and Events

Whenever possible, BARA researchers and AITC members attended tribal events to learn more about the tribes and their concerns. These activities include Veteran's Day

celebrations, powwows, a protest at a proposed radioactive waste storage facility, a funeral, a birthday party, and a nuclear information gathering. The researchers observed the interactions among tribes and the significance of cultural activities that were described in the interviews.

Phase One Supplemental Tribal Survey

BARA researchers contacted tribal administrations by mail and phone and arranged either for the supplemental survey forms to be returned via fax or for appointments during which the researchers and an AITC member, if possible, could gather data on tribal vehicles. Because tribal vehicles are maintained and used within different branches of the tribal governments, the appointments often entailed meeting with several tribal officeholders. These administrators provided information regarding the number and type of vehicles utilized by the tribe, as well as the number of miles traveled by each vehicle, the average number of passengers, and the average number of trips per year. When appropriate, the researchers and AITC member made presentations to the participating tribal administrators and gave them materials.

BARA researchers also interviewed tribal leaders regarding other environmental threats facing participating administrations. Eight general categories of possible threats had been identified during phase one interviews with tribal members. Tribal leaders or representatives commented on the past, present, and perceived future threat of mining related activities, hazardous waste sites, solid waste sites, radioactive waste sites, military activity, power generating sites, population growth, and economic development projects. BARA researchers also solicited comments on any additional threats or pressures facing the tribe that did not fit in the aforementioned categories.

Phase Two Interviews with Cultural Experts

In January of 1998 the Phase Two interviews with cultural experts began with a letter to all members of the AITC. This letter requested that they provide a few names of people to be interviewed for Phase Two of the study. The letter indicated that the interviews would last from a few hours to all day with each individual, as appropriate and desired by the individual. The people to be interviewed were to be chosen because they are recognized by fellow Indian people as thinking deeply about radioactivity and its potential impacts on plants, animals, water, air, and people. The letter further stated that hundreds of Indian people had already been interviewed in Phase One of the project and that the Phase Two interviews were designed to more fully explain the cause and effect relationships between radioactivity and Native American perceptions of the environment.

Over the next few weeks, the members of the AITC worked closely with tribal governments to select people who were interested and qualified, according to the tribe, to talk in depth about these issues. Interviews began in early February with people from tribes in northern Nevada and continued until the last interviews were conducted with people from tribes in southern California. The interviews went as expected, lasting up to a

half day and involving Indian people with clearly developed opinions regarding the nature of radioactivity and Indian culture. Whenever possible, either the Indian members of AITC or the BARA ethnographer met with local tribal government officials to provide them with updates on the progress of the study.

Data Analysis

Several types of data were collected during the American Indian Transportation Study. Information about transportation routes and hunting and gathering areas was coded into a Geographic Information System (GIS) for analysis and display. Information about perceived impacts of the transportation of LLRW, prior experiences, and suggestions for mitigation of potential impacts was transcribed from tapes and interview notes and then coded manually. Coded data and other information from the interviews were entered into a computer database for further analysis. Information gathered during the Tribal Travel Survey was entered into a summary data table. Finally, interviews with cultural experts were transcribed from tapes and analyzed. Each of these types of analysis is described in greater detail below.

Geographic Information System

To handle the large amounts of spatial data that were collected during the study, a GIS was established using two GIS software packages. ESRI's *ArcInfo* was used for data acquisition, management, manipulation, and analysis, and *ArcView* allowed the cartographic presentation of the study results.

A GIS is a computer system that assembles, stores, manipulates, and displays geographically referenced information. The GIS includes both the operating personnel and the database and makes it possible to organize and store very large amounts of information so it can be readily used. The information in a GIS is associated to places, and the GIS allows the user to associate one type of information about a place with other types of information about that place. Each kind of information, such as the location and size of roadways or the type of vegetation growing, is stored in a separate layer or *coverage*.

The GIS established for this study was developed from existing digital cartographic coverages acquired from the United States Geological Survey (USGS) Earth Resources Observation Centers (EROS) Data Center. These coverages of the four involved states, California, Nevada, Utah, and Arizona, were downloaded from the World Wide Web as Digital Line Graphs (1:2,000,000). Within each coverage, the separate feature themes that were obtained include: (1) transportation; (2) political boundaries; (3) hydrology; and (4) cities. Digital information regarding Indian reservation boundaries was obtained via CD-ROM from the Denver, Colorado office of the Bureau of Indian Affairs through the Arizona Geographic Information Council (AGIC). Aboriginal territories of the four ethnic groups whose land is traversed by the proposed transportation routes were

digitized from the report, *American Indian Assessments of the Environmental Impact Statement for Nevada Test Site And Off-Site Locations in the State of Nevada: A Native American Resource Document* (American Indian Writers Subgroup, 1996). The digitized maps were used to create the Aboriginal Territories Theme.

Route Use

In the GIS, each reported road traveled by a study participant was defined as a route. All reported routes were entered digitally into the GIS as a separate route coverage. Attributes were attached to each route in this coverage to record (1) frequency of use (frequency of trips), and (2) number of users (frequency of travelers) for each tribe and ethnic group. The data were normalized to minimize the effect of having different numbers of participants from the various tribes. Therefore, frequency of trips per tribe along each route was calculated by adding the total number of times the route was traveled by tribal members in a year and dividing by the number of study participants from the tribe. Four categories of trip frequency were created - Low (less than two trips per year), Medium (twice per year up to once per month), High (once per month up to once per week), and Very High (once per week or more). The frequency of travelers for each tribe was determined by dividing the number of tribal members who reported using the route by the number of study participants from the tribe. Four categories of traveler frequency were created - Low (less than one quarter of the individuals), Medium (one quarter up to one half of the individuals), High (one half up to three-quarters of the individuals), and Very High (three-quarters or more of the individuals).

Another theme was created to include the three proposed LLRW transportation routes upon which this study is based (LLRW Identified Route Coverage). To make it possible to analyze the frequency data, the endpoint of the routes at the end opposite the NTS was determined to be 70 miles beyond the farthest participating tribe located on the route, the distance from Wells, Nevada to the Idaho state border.

Hard copy maps were produced from the route coverages and overlayed on the LLRW Identified Routes. These maps display spatially the relationships between the two themes. A further analysis of a total frequency of route use was created to incorporate the frequency of all the shared sections among all the routes in the study. Finally, the percentage of LLRW Identified Routes that were used for each category of trips and travelers was calculated.

Use of the Surrounding Regions for Hunting and Gathering

All the areas marked by the study participants as hunting and gathering areas were digitized to create a hunting and gathering coverage. This coverage was then overlayed on the aboriginal territories coverage. No attempt was made to calculate the size of the polygons that were drawn by the study participants to indicate areas in which they continue to hunt and gather.

Creating a Database for Numeric and Textual Data

The responses of each participant to the open ended questions about factors, experiences, and suggested ways to mitigate the impacts of the proposed transportation activities were reviewed independently by two or three researchers. A set of categories was identified, and the responses were again reviewed and coded into the appropriate category. After all responses had been coded, the researchers met in conference to discuss differences until agreement was reached.

After coding, the summary data from the interviews were entered into a computer database using *Microsoft Access*. This database made it possible for the data to be organized and manipulated for analysis. In addition, it provides long term storage for the data in case they are needed again in the future.

Supplemental Tribal Survey Data

The data generated by the Tribal Travel Survey were brief and numerical. These data were entered into a *Microsoft Access* database. This allowed BARA researchers to generate both averages and totals of the number of vehicles possessed by the participating tribes and bands, the number of miles traveled per vehicle by year, and the average number of trips and passengers by vehicle. Those tribes and bands not possessing vehicles were removed from the analysis. The results of this analysis provided the foundation for detailing the importance of tribal vehicles to tribal administrations. These data are stored electronically for future use.

The data generated by the Tribal Environmental Survey complemented the results of the interviews with individual tribal members. BARA researchers used these data to provide a summary of the environmental context in which the participating tribes operate.

Analyzing Text from Interviews with Cultural Experts

The Phase Two interviews with recommended cultural experts were designed to provide holistic statements about issues raised in Phase One. To accomplish this, each interview was taped with the permission of the person being interviewed and with the understanding that the individual would review any portion of the interview that might be used in the report. The tapes were then transcribed and edited to fit into this report. Those portions that were used have been reviewed and included the Chapter Eight.

While direct transcriptions of individuals' ideas about these issues are very valuable for understanding how they establish their opinions, it is also useful to contextualize these statements. Thus ethnographic comparisons were utilized to contextualize these statements. Some of these comparisons are available from previously conducted interviews while others derived from the published ethnographic literature.

Summary

The American Indian Low Level Radioactive Waste Transportation Study required mixed methods of data collection and of data analysis. Considerable effort was required to contact all 29 tribes and subgroups participating in the study, arrange for visits to tribal administrators, tribal members, and cultural experts. A large volume of data was gathered on maps, with tape recorders, in field notebooks, and on record sheets. To analyze the data, researchers created a Geographic Information System, a relational database, and electronic copies of text documents. Additional library research was required to provide the background necessary for understanding the information collected. The remaining chapters present that background, the data, and the analysis.

CHAPTER THREE: BACKGROUND ON TRIBES

Allison Fish, Sarah Stewart, Karen Barton, Diane Austin

In this study, discussion of the transportation of low level radioactive waste (LLRW) to the Nevada Test Site (NTS) across tribal land raised issues including, among many others, the violation of sacred trust, the abrogation of U.S. federal responsibilities to tribes, the contamination of water and food sources, and the uncertainties surrounding jurisdiction. Much information is available about the concerns expressed by U.S. citizens regarding the transportation of radioactive waste (e.g., Freudenburg 1991). Native Americans share many of those same concerns, but they also have distinct cultural and belief systems that lead them to emphasize additional issues. In addition, although all Native Americans have the same right to participate in public policy debates as does any U.S. citizen, members of federally recognized tribes have special responsibilities for tribal land and governments, many of which change according to the whims of U.S. federal policy. To add to this potentially confusing situation, 29 tribes and subgroups elected to participate in this study, evaluating the proposed actions in light of their particular settings and histories. This chapter is included to provide a context in which to understand the responses of tribal members to the proposed transportation of LLRW to the NTS.

The 29 tribes and tribal subgroups that participated in the Transportation Study have reserved tribal lands in Nevada, Utah, Arizona, and California. As shown in Figure 3.1, these lands are generally small and spread out across the study area. Native populations were traditionally scattered and refused to leave their homelands for central reservations. Except for one case, the U.S. federal government engaged in neither treaties of submission nor the forceful collection of the study area tribes onto reservations for their own safety. Thus, alternatives to reservations, such as a combination of allotment and reservation status, were frequently used (Knack 1992). At Kanosh, for example, prior to the termination of the tribe in 1954, non-reservation land titles were held in federal trust for a short time in the name of specific individuals.

The chapter has been organized to demonstrate both the similarities and unique aspects of the tribes participating in the American Indian Transportation Study. Space limitations prevent a thorough discussion of each group, so only information that highlights the tribes' relationships to the land and resources near the proposed LLRW routes has been included here. Study participants were, for the most part, members of one of four ethnic groups: (1) Western Shoshone; (2) Goshute; (3) Mohave; and (4) Southern Paiute. This chapter is organized into four sections. Within each section, there is a discussion of an ethnic group and then information about each of the tribes within that ethnic group that participated in this study. Federally recognized tribes are distinguished and, in the case of composite tribes, their subgroups are identified. As described in Chapter One, the U.S. government is obligated to enter into government-to-government relations with these tribes when conducting activities that affect the tribes, their land, or their cultural resources.

Table 3.1. Land and People of the Participating Tribes

Ethnic Group/ Tribe/ *Subgroup*	**Acreage of Reservation**	**No. of Enrolled Tribal Members Living on Reservation (year of latest information)**	**No. of Enrolled Tribal Members (year of latest information)**
Western Shoshone			
Te-Moak Band of Western Shoshone Indians			
Battle Mountain Band	640	200 (1997)	555 (1997)
Elko Band	193	1326 (1997)	1326 (1997)
South Fork Band	15, 680	121 (1997)	263 (1997)
Wells Band	80	63(1997)	183 (1997)
Ely Shoshone Tribe	111	222 (1997)	299(1997)
Yomba Shoshone Tribe	4,630	90 (1997)	206 (1997)
Duckwater Shoshone Tribe	3900	152 (1997)	312 (1997)
Timbisha Shoshone Tribe *	NA	50 (1997)	300 (1997)
Shoshone-Paiute Tribe of the Duck Valley Reservation **	69,000	--	1562 (1991)
Goshute			
Confederate Tribe of the Goshute Reservation	113,545	71 (1997)	91 (1997)
Skull Valley Goshute Tribe	18,000	25 (1997)	111 (1997)
Mohave			
Colorado River Indian Tribes ***	134,500	--	1,967 (1991)
Fort Mojave Tribe	13,300	1000 (1997)	1000 (1997)
Southern Paiute			
Paiute Indian Tribe of Utah			
Shivwits Band	26,680	189 (1982)	189 (1982)
Cedar City Band	5	138 (1982)	138 (1982)
Indian Peaks Band	8,960	30 (1982)	30 (1982)
Kanosh Band	895	74 (1982)	74 (1982)
Koosharem Band	280	85 (1982)	85 (1982)
Kaibab Band of Paiute Indians	120,431	80 (1997)	350 (1997)
Las Vegas Paiute Tribe	3840	140 (1997)	250 (1997)
Pahrump Paiute Tribe	NA	45 (1997)	100 (1997)
Moapa Band of Paiute Indians	71,954	78 (1997)	163 (1997)
Chemehuevi Paiute Tribe	28,000	500 (1997)	500 (1997)

* Panamint Shoshone
** Shoshone and Northern Paiute
*** Also includes Chemehuevi, Navajo, and Hopi people
1982 -PITU Reservation Plan
1991- U.S. Department of Interior, Bureau of Indian Affairs
1997- data gathered during American Indian Transportation Study

Table 3.1 is a summary of the participating tribes, including acreage of each reservation, the number of persons living on each reservation, and the number of enrolled tribal members. Much of this information was gathered during the Phase One Supplemental Tribal Survey.

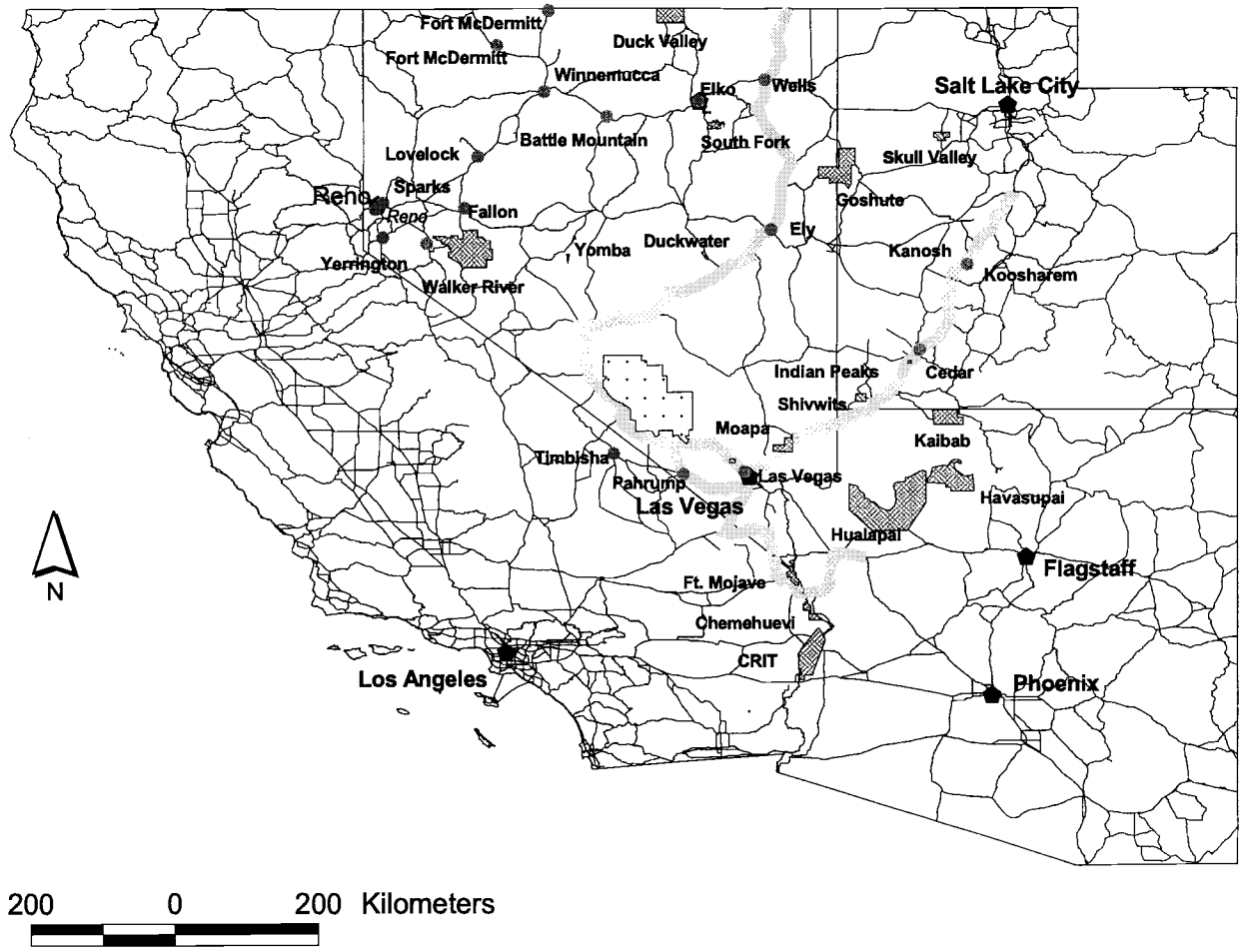


Figure 3.1 Lands of the Study Participants

Following the information on the participating tribes is a discussion of environmental concerns identified by tribal representatives as being of significance to their tribes at the time of the American Indian Transportation Study. These concerns are included in this chapter because they, too, establish the context in which the issues raised by tribal participants can be understood. The links between these environmental concerns and the proposed transport of LLRW to the NTS are described in Chapters Four and Five.

ETHNIC GROUPS AND TRIBES OF STUDY PARTICIPANTS

Western Shoshone

The Western Shoshone, also known as the *Newe*, are a branch of the central Numic speaking peoples. Their aboriginal territory extends through a considerable portion of the Great Basin (see Figure 3.2), with the majority of the tribal members living in the state of Nevada (Thomas, Pendleton, and Cappanari 1986). According to their creation stories, the *Newe* were placed on the Earth by the Creator and dispersed over a large area by the curious Coyote as he carried them on a journey through the land (Smith 1993). Western Shoshone people have a special obligation to care for their land that is present in some stories. The Western Shoshone are to care for Nature in return for sustenance from plant and animal life. In order to prevent overpopulation and overtaxing of Nature's resources it is said that Coyote made death a part of life (Smith 1993). Because Mother Earth provided for the needs of the Western Shoshone, the Newe had special regards for the land. Balance between people and Nature was a necessary for Newe long term survival. Preservation of such a balance is recorded in Western Shoshone tales regarding the necessity for death. Without final death, overpopulation would soon cause the extinction the plants and animals necessary for survival.

The Western Shoshone environment is arid and contains varied plant and animal life. Elevation ranges between 4,000 (valley floors) and 10,000 (mountains) feet, summers are hot and winters are cold, and annual rainfall is between 5 and 10 inches. To utilize the natural resources of their environment, the Western Shoshone developed subsistence strategies, the complexity of which was unrecognized during early Euroamerican contact.

Hunting and gathering the resources of the Great Basin, the Western Shoshone have managed to maintain a precarious, yet balanced subsistence. In the past, they used a wide base of natural resources and distributed their extensive population in low-density groups. For example, one of the primary staples of the Western Shoshones' diverse diet was the pine nut (Crum 1994). The pine nut comes from the pinyon tree, *Pinus monophylla*. Evidence indicates that this tree has been present in the Southwest United States for the last 13,000 years; and its range has been gradually expanding (Lanner1981). The pinyon pine is found at lower elevations and provided building materials, fuel, food, and medicines to the peoples of the Great Basin and Southwestern United States as far back as 6,000 years ago. This oldest evidence of pinyon use by humans comes from seed remains found in a Nevada firepit (Lanner 1981).

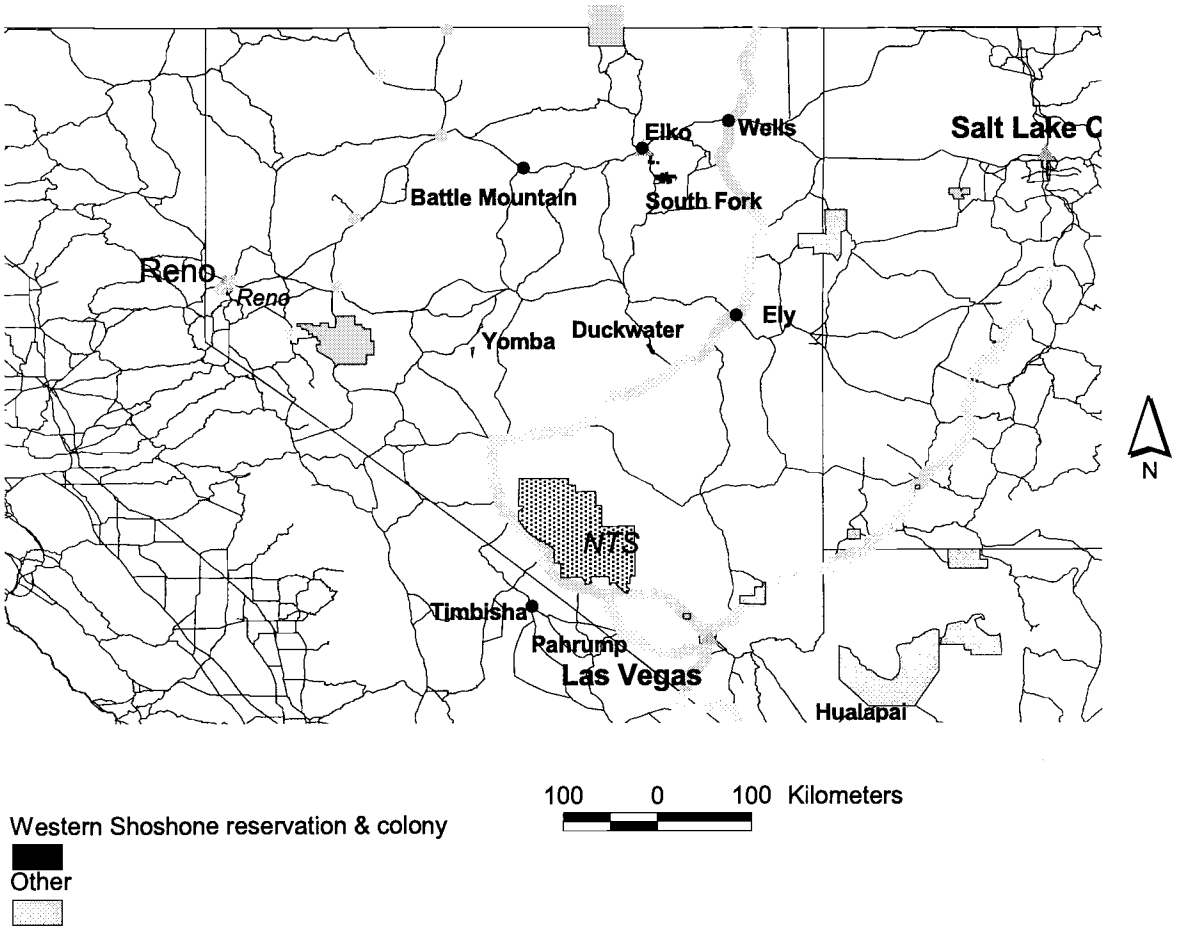


Figure 3.2 Current Location of Western Shoshone Tribes and their Lands

Pinyon pine trees mature after 75 years and continue to produce for approximately 300 more. However, they produce irregularly, so the locations of harvest vary from year to year (Lanner 1981). For the Western Shoshone, the location of harvestable pine nut trees would often determine the location of the winter camps (Thomas, Pendleton, and Cappanari 1986). As a result of the long association with this resource, the pine nut is an important part of ceremonial aspects of life of Shoshone tribes and appears frequently in the oral history (Smith 1993; Crum 1994). The pine nut also figures in early European-Western Shoshone contact. Starving parties of trappers learned of the edible nuts from the Newe and managed to survive the long winters by virtue of this novel resource (Crum

1994). Western Shoshones have for many years expressed concern for their traditional territory and its resources in political statements and policy-driven cultural resource assessments (e.g., Stoffle, Halmo, Olmsted, and Evans 1990, Stoffle, Evans, Halmo, Dufort, and Fulfrost 1994).

Western Shoshone are still recognized for their expertise in weaving. Cradle boards, baskets, and containers for collecting and storing food items are woven from various plant fibers. Of these plants, the willow was and continues to be of special importance (Crum 1994; Thomas et al. 1986).

Traditional Western Shoshone settlement size, location, and population density varied with the seasons. The annual pattern was for small groups of extended families to hunt and gather in areas of overlapping boundaries in the summer months. During the winter, larger and more complicated settlements, comprised of several summer groups, might cohabitate near a larger source of water. These winter settlements were fairly permanent throughout the season. Cultural gatherings of numerous extended family groups occurred at intervals for social and economic purposes (Crum 1994). Such occasions included big game hunts and fandangoes or festivals of gaming and dancing.

Recorded European contact with the Western Shoshone began with the trapper Jedediah Smith about 1827 and Peter Skene Ogden in 1828-29. In comparison to future numbers of whites passing through *Newe* territory, the trapping parties were relatively small. They were followed by a mass influx of Euroamerican immigrants through the Great Basin on the way to the West Coast, primarily in search of gold. The large traveling parties would strip the resources of the Great Basin as they passed through and upset the careful balance that the aboriginal peoples had maintained with the natural resource base. The dwindling resources and the increasing population density sparked conflict between the *Newe* and the Euroamericans. Gold Rush immigrants abused Shoshone people and in retaliation the *Newe* attacked the migrating settlers. The tense situation led to changes in traditional Western Shoshone settlement patterns. Bands larger than extended families formed for the purposes of defense and raiding. These larger units were led by those individuals who, previous to contact with Euroamericans, had organized Newe social and hunting gatherings. On the tail of this movement of people through the Great Basin, came the members of the Church of Jesus Christ and the Latter Day Saints (the Mormons). The Mormons went to the Great Basin in order to permanently settle there and further disrupted the natural environment (Crum 1994; Thomas et al. 1986).

Interaction Between the Western Shoshone and the Federal Government

In response to this increasing level of contact between Euroamericans and Western Shoshone, U.S. federal agents established contact with the *Newe*. The first of these encounters was with Jacob Holeman in 1852. This initial contact was to pinpoint the source of conflict between the two groups. Holeman determined this to be due to the "bad conduct of the whites" (Crum 1994; Thomas et al. 1986). From information he gathered in his next visits, Holeman would propose that a peace treaty be signed with

Newe and that an agency be created to ensure that the aboriginal peoples were treated respectfully by the settlers. In the next few years the position of territorial agent was occupied by a few people who stayed in the area for only a few years at a time and were generally ineffective. For the next ten years, relations between Shoshone and whites were characterized by conflict that was often violent. It was not until plans for the transcontinental railroad, which was to pass through northern Nevada *Newe* territory, that the U.S. was prompted to begin treaty negotiations.

On October 1, 1863 the governor of Nevada met with the Western Shoshone and a Federal agent. A total of twelve Western Shoshone leaders were present at this meeting; including Chief Temoke, Mo-ho-a, Kirk-weedgwa, To-nag, To-so-wee-so-op, Sow-er-e-ga, Po-on-go-sa, Par-a-woat-ze, and Ga-ha-dier. Out of this meeting, the Ruby Valley Treaty was composed and signed by the three concerned parties. In signing the treaty, the Western Shoshone leaders were agreeing to the following: (1) to live in peace with the settlers; (2) to give up the nomadic way of life; and (3) to settle on reservations and colonies that were located in their aboriginal lands. In return, the Shoshone were recognized by the United States as legal owners of the land, though the United States government had rights to utilize this resource (Crum 1994).

Many present day Western Shoshones refer to the 1863 Treaty of Ruby Valley in defining the Western Shoshone traditional territory. However, the implications of the treaty, both its jurisdiction and its meaning, have come under intense dispute. One of the strongest arguments against the treaty has been that not all the Western Shoshone were represented at the signing (Crum 1994). At that time, the Western Shoshone did not have a central government or leadership, nor did they live in groups that could be identified easily as separate bands or tribes under a single political leader. Loosely formed bands, for the purposes of defense, had formed shortly after the migrating settlers had arrived in noticeable numbers. However, these units were not representative of traditional Western Shoshone peoples. The traditional group structure was of an extended family group that lived in a particular area (Crum 1994; Thomas et al. 1986). Therefore, some contend, those who stepped forward as leaders did not have the right to enter the entire ethnic group into contract with the U.S. government.

Both supporters and opponents of the treaty recognize that the U.S. government failed to fulfill its responsibilities as outlined in the treaty. The goods and services that the U.S. was to distribute equitably among the Western Shoshone appeared sporadically (Crum 1994). It was not until the late 1870s that the reservations agreed upon in the Ruby Valley Treaty were created. One of the first of these was the Duck Valley Reservation. A group of Western Shoshone leaders expressed displeasure with this reservation and refused to move to Duck Valley. As a result the U.S. government threatened to cease the annual payments as stipulated in the Treaty of Ruby Valley.

Between the signing of the Ruby Valley Treaty and 1935 there were little changes in regard to the relationship between the Western Shoshone and the United States, although the tribe did receive recognition during this time period. In 1935, New Deal

agencies brought it to federal attention that many Western Shoshones were not enrolled in any tribe. Nevertheless, Western Shoshone people were living in organized colonies and operating under identified leaders. Many of the Shoshones, reservation and non-reservation, joined together to elect a unified and traditional council. The U.S. government refused to recognize this traditional council, called Te-moak, and formed a federally recognized tribe of the same name. This was the creation of the Te-moak Bands of Western Shoshone Indians with a Council made up of representatives of each member tribe. Currently Te-moak Bands Council consists of four colonies - Battle Mountain, Elko, Wells, and South Fork - all located in northeastern Nevada (see below).

The Western Shoshone of the Te-moak Bands filed a claim before the Indian Claims Commission (ICC) in 1951. This claim was instigated and aided by Utah lawyer Ernest L. Wilkinson. On October 6, 1962 the ICC found that Western Shoshone aboriginal lands were taken by "gradual enroachment of white settlers" (ICC 1962). The ICC determined that the 24 million acres of Western Shoshone aboriginal territory should be paid for by the U.S. government. In order to establish the value of this land in 1874, the date determined by the ICC, an appraisal was made estimating the value at approximately $26 million. However, Western Shoshone participation in the process had been opposed by many Western Shoshones. In 1974, the Western Shoshone Legal Defense and Education Association (the Association) was formed by Western Shoshones who opposed the "sale" of the Western Shoshone lands and filed a petition to stop the proceedings of the ICC. Legal action on behalf of the Western Shoshone refusing an ICC settlement continued through the 1970s. On December 6, 1979, a judgment award was certified by the Court of Claims for the Western Shoshone.

The issue of title to Western Shoshone aboriginal territory came to a head in the *United States vs. Mary and Carrie Dann* (Ninth Circuit Court of Appeals, May 1983). The Dann sisters were sued for grazing their cattle on Bureau of Land Management (BLM) land which was also Western Shoshone aboriginal territory. When the court ruled against the Dann sisters, they appealed to the Ninth Circuit Court of Appeals. That court found that the title to the land under the Treaty of Ruby Valley still needed to be resolved before the Dann case could be settled. This decision prompted the U.S. Court of Claims to establish a bank account for the Western Shoshone Nation for the $26 million. The distribution of that money has been a long standing concern among Western Shoshones.

Beginning in 1980, Western Shoshone tribes and the Association took legal actions to oppose the payment of the ICC judgment because of concern that acceptance of the payment would mean that their aboriginal title to the lands had been extinguished. In May 1983 the circuit court ruled in favor of the Danns use of the land by virtue of "individual aboriginal rights," at the same time the ruling abolished aboriginal title to the land. In 1986, the Federal District Court ruled that the Western Shoshone lost their land upon the judgment award certification by the Court of Claims to the General Accounting Office. No plan for distribution of the money has yet been accepted by the Western Shoshones.

Over the past century there has been a great increase in the numbers of Western Shoshones living on reservation lands. Before 1927, less than 20 % of the total population lived on reservations; by the 1950s this figure had jumped to 50%. A census in 1980 revealed that the total population of Western Shoshones living on reservations was 2,923. This was an increase of 900 individuals since the 1970s. Hunting and gathering the wild game and vegetation is still an important aspect of annual activities. During an interview for this study, a tribal member captured the continued importance of tribal members' interaction with the natural environment:

> *It isn't fall unless you have your deer meat. It isn't September unless you go out and eat your ground hog.*

The following sections contain short descriptions of the Western Shoshone tribes and colonies participating in this study.

Te-Moak Band of Western Shoshone Indians

The Te-Moak Bands of Western Shoshone Indians, a federally recognized tribe, is a product of Indian Reorganization Act of 1934 and one of the three organizations created at the time to govern those Western Shoshones who had never moved to the Duck Valley Reservation. The purpose of the Te-Moak Bands Council was to establish a central Western Shoshone government. The original colonies that had voted in support of the Te-Moak Bands Council are Elko and Battle Mountain (Crum 1994; Thomas et. al, 1986). Although the federally recognized tribe adopted the same name, during much of its early history the Te-Moak Bands Council organization was not federally recognized, nor was it supported or representative of most Western Shoshones.

The Te-Moak Bands Council was originally composed of colony representatives who formed an inter-tribal governing body. These representatives were elected from each colony's own local council. In its first years Austin, Battle Mountain,Beowawe, Elko, Ely, and Ruby Valley sent representatives to the Te-Moak Bands Council. Since Western Shoshone had traditionally been spread over a vast area, they sought a tribal council to represent the numerous smaller groups and colonies. However, this strategy never appealed to most Western Shoshones and failed to unite the majority (Crum 1994).

Presently, the Te-Moak Bands of Western Shoshone Indians includes four colonies: Battle Mountain; Elko; Wells; and South Fork. The Te-Moak Bands Council is made up of elected representatives of each of the bands and has a chair elected by all tribal members. The Te-Moak Bands Council is the official voice of the Bands in government-to-government relations with the U.S. federal government. However, the Council allocates considerable authority to each of the bands, including the authority to write and manage federal grants and programs. Due to the geographic dispersion and for the retention of individual identity both at the political and cultural level, each colony is treated separately in the Transportation Study. All four bands have land in northeastern Nevada near the proposed LLRW transportation Route A; Wells lies directly on the route.

Battle Mountain Colony

Located about a mile off I-80 in Lander County, Nevada, the Battle Mountain Colony is one of the original Te-Moak members. Battle Mountain Band was created by executive order on June 18, 1917 with 677 acres of land set aside for its members ("Battle Mountain Band" 1996). Currently the band has approximately 555 members, half of which live at the colony. At present, the total tribal land area is 640 acres. The Battle Mountain Colony was reorganized as part of the Te-moak Bands in the 1934. Battle Mountain was marked for termination in the early 1950's under the bill HCR7552. However, in a surprising move by such a weak political entity, the Battle Mountain Band successfully opposed this action. Citing poverty and neglect, the Battle Mountain Band claimed ancestors' rights to the 1863 Treaty of Ruby Valley (Crum 1994).

Elko Colony

The Elko Colony is located in northeastern Nevada and was established in early 1918 (Crum 1994). Elko was the second colony to approve, by majority vote, the creation of the Te-Moak Bands Council under the Indian Reorganization Act of 1934. At present the colony has 1,326 enrolled members and two parcels of land, totaling 193 acres, in the vicinity of Elko, Nevada (www.itcn.org/tribes/elko/html). Elko is the second largest metropolitan area in northern Nevada, next to Reno and is the primary center of mining activity in this section of the state.

South Fork Colony

The South Fork Colony is located thirty miles to the south of Elko. The colony is located in a rural setting and its members farm, ranch, and are employed outside of the community. The government of South Fork is responsible for the Ruby Valley and Odger's Ranch areas. The total population of these three communities is around 263. Of these 263 members, approximately 121 live on the Reservation. In 1937, approximately 13,000 acres were placed in trust for Western Shoshones of South Fork, Ruby Valley, and Odger's Ranch. This land was set aside under the Indian Reorganization Act of 1934. The Colony has recently received a grant to look into abandoned mines in the Ruby Mountains whose stockpiles of wastes run off into the local river. The South Fork Band plans to conduct tests on the wells that provide for local water consumption to determine the degree of contamination. There is some suspicion in the community that illegal dumping is occurring, though this is as yet unresolved.

Wells Colony

The Wells Colony is the most recent addition to the Te-Moak Bands Council (Crum 1994). The colony is located next to the town of Wells, Nevada, at the intersection of I-80 and US 93. This area is the approximate location of the headwaters of the Humboldt River. The river is an important natural resource for the surrounding

communities. There are 183 members enrolled in the Wells Band; 63 of whom live on the colony with an additional 20 non-Indians.

Ely Shoshone Tribe

The Ely Shoshone Tribe has land on the southern edge of Ely, a mid-eastern Nevada town located in White Pine County. The reservation was established on September 28, 1931 by Authority Act 27 of June 27, 1930 (www.itcn.org/tribes/ely.html). In 1934, the residents of Ely Colony rejected joining the government of Te-Moak Bands Council. A constitution for the Ely Shoshone Tribe was approved on April 8, 1966. At present, the governing body of the Ely Council consists of five members elected every two years. Within this group, officers are chosen to represent both the council and colony. The council's powers include the ability to employ legal council, and to create and regulate sub-organizations (Crum 1994).

The total area for the Ely Shoshone Tribe is approximately 111 acres. Ely has 299 enrolled members, 222 of which live on Ely Reservation, and 131 of those individuals live in the adjacent town of the same name. The city of Ely and the Ely Colony are situated at the intersection US 93 and US 50 along the proposed transportation route A of this study. The reservation's day care center is located right off the highway on which the waste would travel on its way to the NTS. The degradation caused by mining has prompted the tribe to begin developing codes and policies for protecting the environment.

Yomba Shoshone Tribe

The Yomba Shoshone Tribe, which was established in early 1938, is located in western Nevada, to the southeast of Reno. The Tribe has 206 enrolled members, and 90 of these live on the reservation. The reservation covers approximately 4,630 acres. Yomba Reservation has an agriculturally based economy. In addition to this many of the people hunt and gather the natural resources around the reservation. Two relatively important resources are the creosote bushes and game. The areas where these two resources have been most abundant lies between the Nevada Test Site and Tonopah, Nevada. Contamination, and general degradation, of this area have decreased the availability of these resources. The tribe has recently passed a resolution opposing the transportation of hazardous wastes roads close to the reservation and through the nearby town of Gabbs. In addition to this, the tribe has been developing a system of environmental codes with the help of the Nevada Indian Environmental Coalition. The Yomba Reservation is nearest to proposed route A.

Duckwater Shoshone Tribe

The Duckwater Shoshone Tribe was established in 1940, under the Indian Reorganization Act of 1934. Two ranches, the Florio Home Ranch and the Florio Bank Ranch, were combined and this land was used to establish Duckwater. The Duckwater Reservation is located in north central Nevada. The Tribe has 312 enrolled members, 152 of which live on the reservation. The reservation covers an area of approximately 3,900

acres. Agriculture is a significant part of the economy, both for Indians and non-Indians, and any possible contamination of the water supply is a concern for the community. A major feature of the reservation is the presence of warm springs.

The tribe has a catfish farm located near the Big Springs on the reservation and just off Highway 379. In addition to this, the tribe is considering a proposal for a second catfish facility to be located at Little Springs. Other economic proposals under tribal consideration include the building of a swimming pool and resort, a gas station and convenience store, and a hydroponics plant. Since the early 1980s the Duckwater Reservation has been host to the annual Duckwater Festival. Originally this festival placed importance on traditional games, crafts, and practices and was also used as a vehicle for carrying the message that the Shoshone aboriginal land was not for sale (Crum 1994).

The Tribe has expressed concern about the transportation of any hazardous materials through the reservation on Highway 379, especially due to the proximity of the road to the springs (approximately 400 yards) and the concern for water pollution. Presently, the Tribe has no formal environmental codes or policies. The Tribe has recently received a General Assistance Program grant from the U.S. Environmental Protection Agency. The grant will be used to establish an environmental office and environmental codes. The reservation is nearest to proposed LLRW transportation route A.

Timbisha Shoshone Tribe (Panamint Shoshone)

Otherwise known as the Panamint Shoshone of Death Valley, the Timbisha Shoshone Tribe received federal recognition status in 1983 and has an enrollment of approximately 300 people, 50 of which live on the reservation. The Panamint Shoshone speak a separate language from other Shoshone groups. The two languages in question are nearly mutually intelligible and are closely related (Thomas et al 1986). The aboriginal territory claimed by the Timbisha people covers 11 million acres in eastern California and northwestern Nevada. In 1933, the Park Service created Death Valley National Monument, containing 90% of Timbisha land, thus appropriating and cutting the tribe off from traditional and necessary resources. In 1936, the tribe was relocated to its present spot, the "Indian Village," located at the edge of Death Valley National Monument. Since earlier this century the Timbisha have been in conflict with the Death Valley National Park Service. Initially, after settling into the Indian Village, the Timbisha would move away to cooler climates in the summer, a traditional migratory pattern. After the tribe had left the Park Service would bulldoze the "abandoned houses". In order to protect their homes, the Timbisha were forced to settle year-round in the Village. Restricted access to the traditional territories in Death Valley National Monument has made it difficult for the Timbisha tribe to preserve cultural practices of long standing. Due to the scarcity of accessible employment opportunities, only 50 people are presently living in Indian Village.

Under the California Desert Protection Act of 1994, the government guaranteed the Timbisha people consultation rights in the decision of a land restoration base within their traditional territories. From the Timbisha perspective, the Interior Department has breached the agreement between the two governments by refusing to consider any land which lies in the national park. Since 1994, Timbisha has taken its case to the White House. In addition to this, the Tribe has formed an alliance of native peoples who protest that the National Park Service remains on Timbisha indigenous lands.

The Timbisha have actively opposed the destruction of their ancestral homeland in the Panamint Mountains and valleys. As yet, the tribe has no environmental program or policies. However, the Tribe is planning to develop tribal environmental codes. An immediate concern for the Timbisha Tribe is the CR Briggs/Canyon Resources open pit heap leach cyanide gold mining. CR/Briggs/Canyon Resources maintains a gold mining operation just two miles outside the Death Valley Park boundaries and in the ancestral homeland of the Panamint Shoshone. The mining operation threatens to destroy an ancient trail, a large waterfall of cultural importance, and wetlands. Proposed LLRW transportation route A passes near the Timbisha Tribe.

The Shoshone-Paiute Tribe of the Duck Valley Reservation

The Duck Valley Reservation was originally intended for the Western Shoshone, as outlined in the Treaty of Ruby Valley. However, as demonstrated by the continued Shoshone occupation throughout northern Nevada, relatively few people settled there. Consequently, the U.S. federal government began to encourage the emigration of Northern Paiute peoples to Duck Valley (Crum 1994). The policy was so successful that, due to an increasing population which was beginning to outgrow its resources, 69,000 acres were added to the reservation in 1886. The two ethnic groups have shared Duck Valley since 1880, and over the years there has been a considerable mixing of cultures and individuals. Intermarriage has become common and these unions have led to a new identity for the people living on the reservation. Most people who are enrolled members of Duck Valley view themselves as Shoshone-Paiute. In the 1980s, the Duck Valley Shoshones briefly considered joining the Te-moak Council due to the internal allocations of power within the tribe (Crum 1994). The nearest proposed LLRW transportation route is route A.

The Shoshone Paiute Tribe of the Duck Valley Reservation is governed by a Tribal Council. The Tribe currently has an environmental office, and an employee is on loan from the Environmental Protection Agency to help manage the environmental program. The Rio Teno copper mine is located near the Duck Valley Reservation. Associated with the mine are holding ponds for a cyanide mixture used for leaching copper. These ponds have in the past overflowed and continue to flow into the river at a point only twenty miles upstream from reservation boundaries, devastating local fish populations. According to the EPA specialist, the river water at the reservation's edge does not meet minimum health standards. In response, the tribe is working on establishing a water treatment program (personal communication, Renee Dufault, 1997).

Western Shoshone National Council

Several thousand Western Shoshones are not members of any Federally recognized tribe. Some of them, as well as some members of the Federally recognized tribes, consider themselves to be represented by the Western Shoshone National Council (WSNC). The WSNC was established in 1984 in an attempt to organize all Western Shoshones both as a political and cultural group. The WSNC strives to represent Western Shoshone peoples and lands, especially those which fall outside the boundaries of any reservation. The WSNC members are elected by the communities that seek representation on the council, including two federally recognized tribes, the Traditional Western Shoshone Cattlemen, the Great Basin Descendants, and the Dann clan of Crescent Valley. The Great Basin Descendants is a loosely organized group established to represent Western Shoshones not living on reservations. Although the WSNC is not recognized by the U.S. government, it maintains legitimacy as a traditional Western Shoshone government. On December 2, 1995 the WSNC enacted the "Western Shoshone Nation Declaration of a Nuclear Free Zone." In this declaration, the WSNC opposes the expansion of the Nevada Test Site and the Yucca Mountain Project.

Goshute

The Goshute people have traditionally inhabited the area that is to the west of the Great Salt Lake (see Figure 3.3). To cope with their environment, the Goshute devised a resourceful and complex subsistence strategy that allowed for minimal or no significant economic surplus. The subtleties of this system went unnoticed in early contact and analysis of these people. A hunting and gathering people, the Goshute maintained cyclical movement pattern, including low population densities and flexible boundary limits. Since the valley floors are relatively unproductive, the Goshute gathered most of their resources in the mountain ranges and occasional fertile valley that fell within the aboriginal lands (Malouf 1950). Annual precipitation in aboriginal lands ranges from 4.5 inches to the rare case of 12.5 in the Deep Creek Mountains. Though still quite arid, these higher elevations afford increased annual rainfall and supports a higher density of plants and animals.

Traditional Goshute territory in the Great Basin extends from the Great Salt Lake to the Steptoe Range in Nevada and south to Simpson Springs (see Figure 3.3). The Goshute people were migratory, and in the summer traveled in small groups of one to three nuclear families. In the wintertime, villages consisting of multiple summer groups would form. As for other Great Basin peoples, the pinyon pine nut was extremely important to the Goshute people both as a food and a material, and often winter camps were chosen with consideration of pine nut availability. Over time, a subsistence strategy was developed by the people that maximized the productivity of the minimal resources with which they worked.

There is substantial evidence that the Western Shoshone and Goshutes are closely related. The two groups speak what are considered to be two dialects of the same language (Malouf 1950). The variation between dialects is no greater than that between

different Western Shoshone tribes. Culturally the two groups are also quite similar. Ethnographers note that differences could be due to the Goshute occasional intermarriage with local Ute peoples (Malouf 1950).

Euroamerican contact with the Goshute people occurred in the late 1827 when the trapper, Jedediah Strong Smith, made preliminary forays into the Great Basin (Malouf 1950; Crum 1994). Later, due to the mass influx of European and Euroamerican immigrants and settlers, conflict arose. In 1847 the Mormons moved into the area of the Great Basin, settling on lands that the Goshute traditionally regarded as their homeland. These new settlers represented the first prolonged contact between Goshute and Euroamericans. With these settlers came diseases to which the Goshutes had never before been exposed. The Goshute population was decimated by diseases such as measles, which alone caused the death of hundreds in 1848 (Chamberlin 1908). To complicate matters further as the Mormons and other settlers began farming and grazing their livestock, it became apparent that the two groups subsistence patterns were competing for water and land productivity. Finally, to further intensify strained relations, there were instances of violence. The two unprovoked massacres of Goshute people in Skull Valley and Bear Creek caused a violent reaction on the part of the Indians. This tense situation continued for the next twenty years until the U.S. government was economically motivated to intervene.

Interaction Between the Goshute and the Federal Government

Peaceful relations between the Goshutes and the new settlers were pursued by the U.S. government in the early 1860s. Prompted by the same railroad that led to the Treaty of Ruby Valley and the conflicts between settlers and native peoples, the U.S. government made attempts to negotiate with the Goshute people. This 1863 Treaty of Goshute was not one of ceded land, rather it was an agreement to the end of hostilities. It was agreed in this treaty that the Goshute would receive $1,000 a year for twenty years in return for the use of their territory. The Goshute also agreed to give up their nomadic ways and resettle on a reservation; however, they did not give up sovereignty of their land.

Most of the Goshute people refused to resettle on the reservations of eastern Nevada, outside of Goshute aboriginal territory. Because of this, the federal government cut off the annuities agreed upon in the treaty. Instead, the Goshute people continued to live in the same areas that they had before the treaty was signed. During the next twenty years Goshute people began to settle in larger, permanent communal farms in the Deep Creek and Skull Valley areas (Chamberlin 1908). Both of these colonies were traditional Goshute permanent settlements established long before the appearance of Europeans in the Great Basin. In the 1910s, reservations for Goshutes were created at these two localities.

At present Goshute people reside on two reservations in Utah and eastern Nevada. Both tribes, the Confederated Tribe of the Goshute Reservation and the Skull Valley Goshute Tribe, participated in the study.

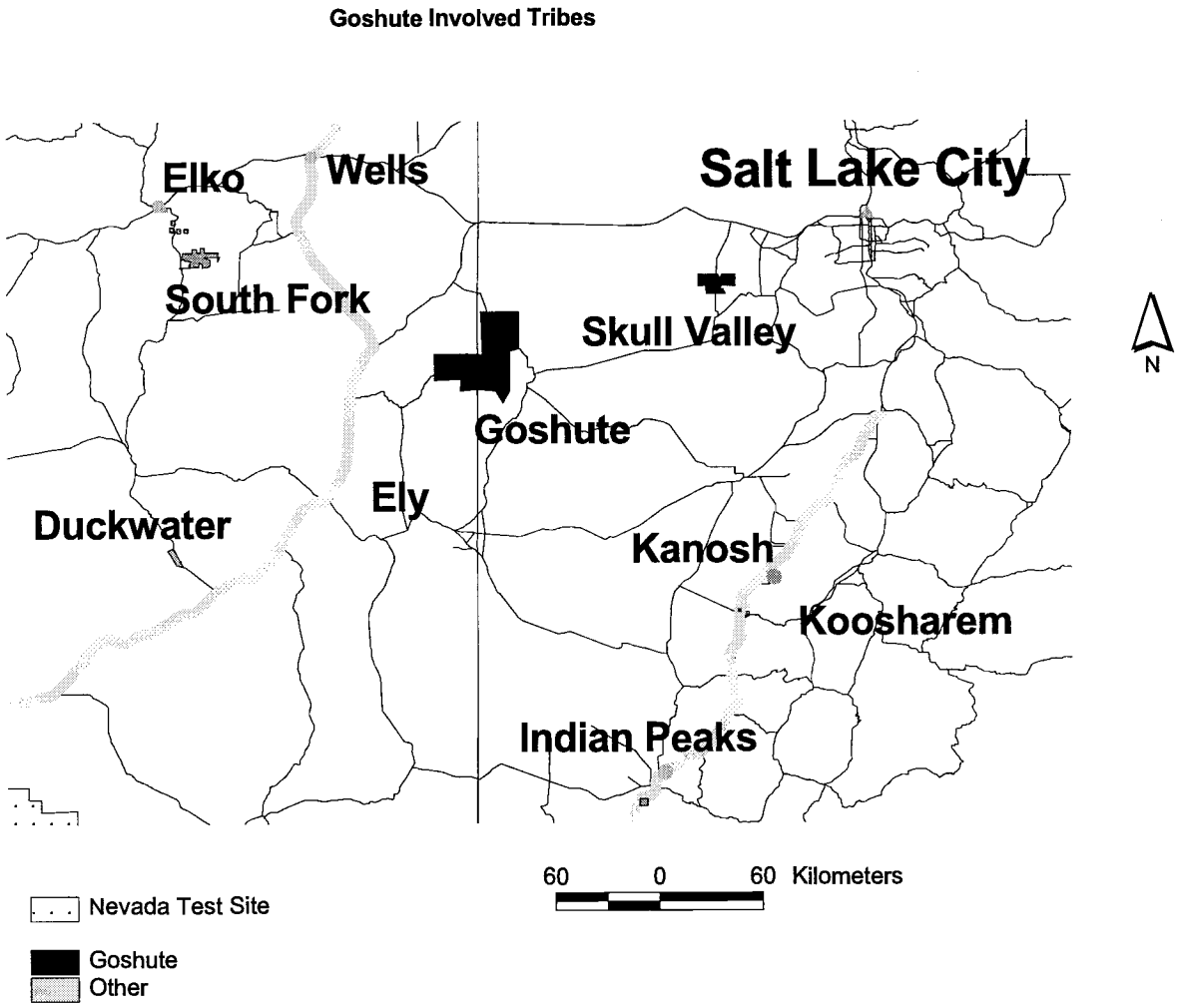


Figure 3.3 Current Location of Goshute Tribes and their Lands

Confederated Tribe of the Goshute Reservation

The Deep Creek Goshute Reservation straddles the northern Nevada-Utah border near the Pony Express Trail. Located in the Deep Creek Range and the neighboring valleys, the reservation is within a traditional area of Goshute activity. Dense and permanent settlement of this area by Goshute people began around 1875 (Crum 1994). The reservation was established on May 20, 1912 with 160 acres of land in Utah. In the next two years approximately 30,000 more acres of land in both states was added to the reservation. Today the Confederated Tribe of the Goshute Reservation covers approximately 113,545 acres of land. A total of 91 individuals are enrolled in the Goshute Tribe. The Tribe is governed by a five member Tribal Council and Chairperson. The Tribe established an environmental office in 1995. Among many other responsibilities,

the environmental program manager is working to address problems of open mine shafts and tailings piles left on the reservation by non-Indian lease holders.

Skull Valley Goshute Tribe

The Skull Valley Goshute Reservation was created in September of 1917. At that time, approximately 18,000 acres in the semi-arid Skull Valley were set aside for the Tribe. The reservation is located 60 miles southwest of Salt Lake City. Today the Skull Valley Goshute Reservation covers a approximately 113,545 acres of land. The Skull Valley Goshute Tribe is governed by a Tribal Council headed by a Tribal Executive Committee including a chairman, vice-chairman and secretary/treasurer. Executive committee members serve four-year terms. Tribal enrollment is 111, with 25 individuals living on the reservation.

A majority of tribal members live and work in the surrounding metropolitan areas of Salt Lake City, Grantsville, Stockton, Toole, and Ibapah. About 90% of tribal funding comes from the lease of tribal land to Hercules, Inc. for a facility testing rocket motors. Most land on the reservation is suitable only for livestock grazing, though 200 acres of land are irrigated by a system funded by the BIA. In late December of 1996, the Skull Valley tribe signed an agreement to lease 50 acres of on-reservation land to a company wishing to temporarily store high level nuclear waste there. The Skull Valley tribe began considering housing the facility in the early 1990s (Associated Press 1992). The activities regarding the nuclear fuel storage facility were at a peak during the American Indian Transportation Study, so tribal leaders limited the Tribe's participation in the study. The reservation is nearest to proposed LLRW route A.

Mohave

The Mohave also are known as the *Pipa Aha Macave*, the People by the River. As the most northern of the Yuman tribes, Mohave ancestral lands extended along the Colorado River from Black Canyon to just south of what is now Parker Dam (see Figure 3.4). The Mohave believe that their earthly origin lies in Spirit Mountain. Spirit Mountain is a peak which overlooks their ancestral lands, northwest of their present reservation. According to legend, the Great Spirit Matavilya, born from the union of Earth and Sky, was killed before he could teach his people all they needed to know of their world. A younger deity, Mastamho, then took upon himself the responsibility of shaping the land and teaching the people how to cultivate it. He drove a willow stick into the Earth and drew out the Colorado River, which he gave to his people along with all that grew alongside it. The river was thus at the heart of Mohave civilization (Fort Mojave Tribe nd.).

In addition to the river and the land, Mastamho created for his people Spirit Mountain, the spiritual center of Mohave life. According to one version, Mastamho told the Walapai, the Chemehuevi, and the Yavapai to scatter in the mountains but told the Mohave that they were to stay because everything they would need had been provided

along the banks of the river (Sherer 1994). An integral part of the Mohave belief system is the concept of dreaming: in their dreams, or *su'mach*, individuals learn what personal skills and leadership roles they should develop (Kroeber; Clifton; Fontana 1986). Dreams are thought to be caused by the spirit wandering while a person is asleep and the spirit experiencing things in the real or spirit world. Dreams are associated with both religious and secular events that take place during an individual's life.

The dreams are separated into *sumach ahot,* which can be translated to "dream lucky" or dreams that can give power to an individual, and dreams that are nearer an everyday sleep experience. Attributes such as knowledge and courage can only be achieved by dreaming about them. Learning about culture was not considered to be successful unless the individual had dreamed about them first. By returning in dreams to Spirit Mountain during the first moments of creation, dreamers can see the origin of things and can receive gifts of skill or historical knowledge from Mastamho ("The People by the River" nd.). It is believed that ghosts, after cremation, go to Salyayta, the land of the dead. This land is found in the sand hills downriver from the Mohave Valley, near the Needles Peaks.

Ancestors of the modern Mohave originally settled in the Mohave Valley in the 12th century (Sturtevant 1978). They practiced a dry farming method, which depended on the annual flooding of the Colorado to irrigate the land. Floodplains were planted with maize, tepary beans, and melons; crops were supplemented with fish and game; and mesquite beans were gathered in the wild. In the event the floods did not occur the Mohave could eat mesquite beans and beaver (Dutton 1976). The Mohave traditionally visited people at great distances (Kroeber 1951); their prosperity allowed them to travel as far as the Pacific Coast in trade networks with other tribes (Fort Mojave Tribe nd.).

Prior to Euroamerican contact, the Mohave had a patrilineal society and contained at least three recognized bands that represented northern, central, and southern divisions. They had a head chief for the tribe. The duties of the chief are obscure, and it is unknown how long the institution of a chief existed in Mohave culture before extensive contact with whites (Sturtevant 1978).

Interaction Between the Mohave and the Federal Government

The Mohave flourished along the banks of the Colorado River and had the largest concentration of people per square mile in the Southwestern United States by the 16th century (Sherer 1994). However, the arrival of trappers and settlers threatened their civilization. In 1850, the United States annexed territory, including Arizona. Expeditions were sent out along the Colorado River so the U.S. government could build a fort in the vicinity. These resulted in U.S. government knowledge that the Mohave people existed. Other expeditions included surveys for wagon route trails and railroad. Later came the

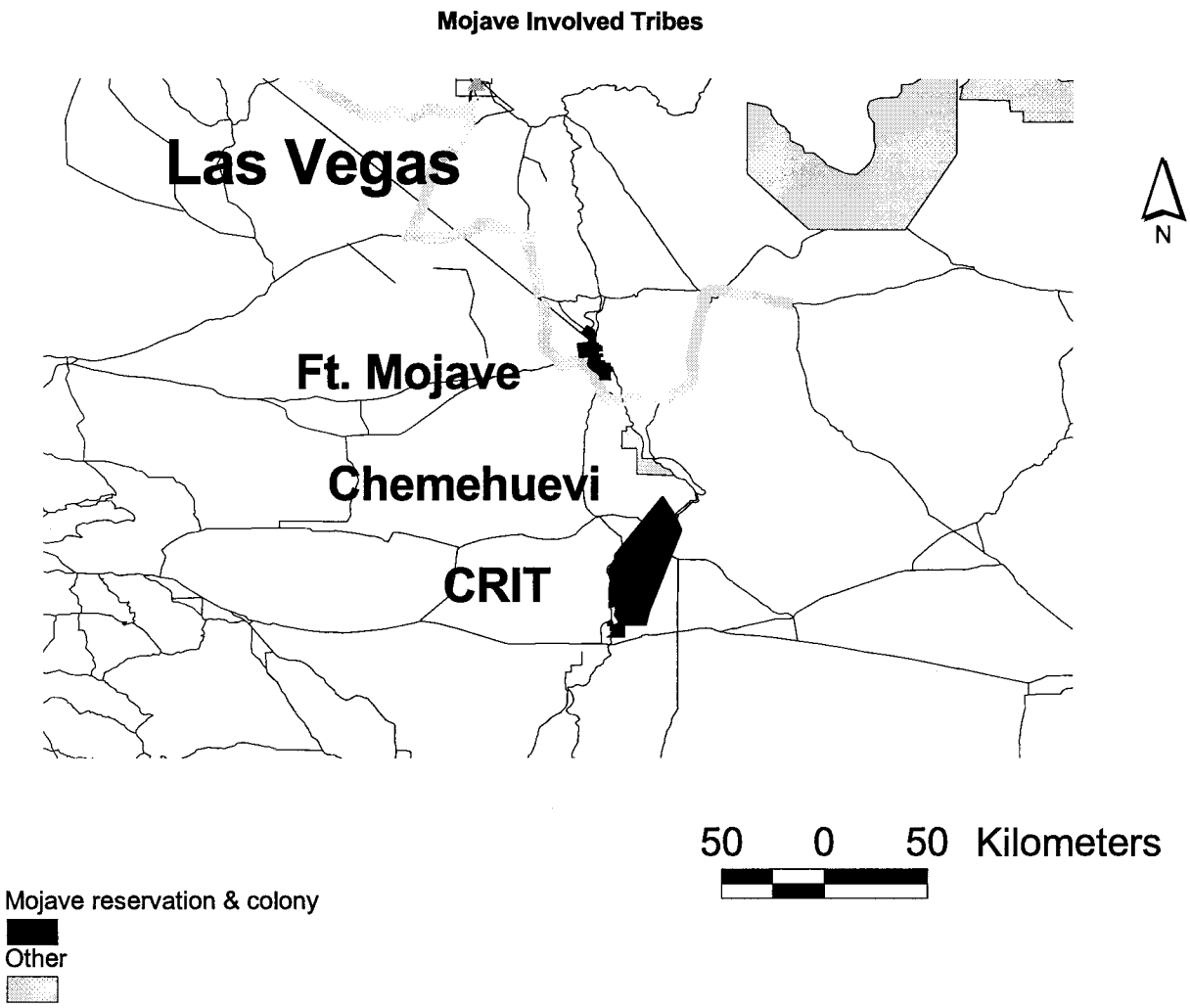


Figure 3.4 Current Location of Mohave Tribes and their Lands

Church of Jesus Christ of Latter Day Saints (the Mormons) and steamboats into Mohave country. Two wagon trails of emigrants crossed Mohave territory in 1858, ultimately ending up in a conflict between the Mohave and the settlers. It has been estimated that four settlers and twenty-four Mohaves were killed, which was later deemed as being a massacre against the emigrants. In 1859, the U.S. War Department built a fort outside present day Needles in order to protect the river crossing. An army crackdown began and resulted in a battle; the Mohaves were overwhelmed by the army's gun power (Sherer 1994).

Following the battle, Mohave chieftains sued for peace, and, in the late 1800s, the Great Chief *Homoseh awahot* relinquished his responsibilities to *Yara tav*, who planned to make peace with U.S. government. In 1859, some Mohave were induced to migrate

south to the Colorado River Valley (Sturtevant 1978). They were further encouraged to migrate by *Yara tav* in March of 1865, when the United States government created the Colorado River Indian Tribe Reservation. The incentive to migrate included 75,000 acres of land and promises of farming and irrigation projects. The migration brought two groups of the present tribes: the Fort Mojaves and the Colorado River Mohaves. It is estimated that *Yara tav* led 500 to 800 Mohave to move south, in spite of his disapproval of the poor farmland the tribe had been allotted. *Homoseh* then resumed his post as chief to the conservative fraction of the Mohave who refused to leave their ancestral homeland in the Mojave Valley.

From 1870 to 1890, the Mohave experienced a great reduction in population due to disease and poverty. During this time, a boarding school was founded in the old fort, and it was made compulsory for Mohave children to attend and to learn Euroamerican languages and culture. Euroamerican farming methods were taught to the older Mohave, but most turned to wage earning from railroads and mining operations because of the low quality of the farmland (Klasky 1997).

Half a century after the establishment of the Colorado River Reservation, in 1911, the Mohaves in Mojave Valley were granted a reservation consisting of 31,328 acres, including the old military outpost, reserves on the California and Nevada side of the Colorado, and checkerboard farmland on the Arizona side. The distance between the two fractions of the Mohave did not prevent a large amount of visiting and intermarriage; travel between the two reservations became essential to preserving Mohave culture. Today there are two federally-recognized tribes of the Mohave people (Klasky 1997).

Colorado River Indian Tribes

The Colorado River Indian Tribes (CRIT) was formed though an act of Congress that became known as the Act of March 3, 1865. The amendment states, "All that part of the public domain in the Territory of Arizona lying west of a direct line from Halfway Bend to Corner Rock, on the Colorado River, containing about seventy-five thousand acres of land, shall be set apart as an Indian reservation for the Indians of said river and its tributaries" (Bureau of Ethnic Research 1958). In the establishment of that reservation, the U.S. government proposed a project wherein the Indians would build a canal from the Colorado River. The purpose of the project was to improve irrigation for farming so that the Indians would have more reliable crops. Due to the lack of funding within the first few years the canal was not completed and the first plantings did not yield as many crops as had been anticipated. The goal of the U.S. government was to have a successful reservation made up of several different tribes. However, the Mohaves were more or less given sole possession of the land because the U.S. government determined they were the only permanent residents of the Mojave Valley. The first ten years of the reservation were difficult due to the failure to complete the canal and the lack of adequate medical facilities (Bureau of Ethnic Research 1958). The boundaries of the reservation have changed over time, and today the reservation includes Western Arizona near Parker and also part of California (Bureau of Ethnic Research 1958).

During World War II, the town of Poston, within the CRIT Reservation, became a concentration camp for around 20,000 Japanese. Few of the tribal members were aware of this U.S. government action. In 1945, after the war, the reservation was divided into two sections, the Northern Reserve for the Mohave and the Chemehuevi and the Southern Reserve for additional Indian groups that were to be settled on the Reservation. The Bureau of Indian Affairs sought to increase the size of the reservation in order to secure the land for the Indians and make money off the irrigation projects. The decision to divide the reservation, Ordinance Five, was passed in 1945 but Indians from other tribes were slow to relocate there. The Federal government started putting more money into the reservation in 1948, and Hopi and Navajo people began moving onto the Southern Reserve. There remained concern about how secure their land would be (Bureau of Ethnic Research 1958). Today, the CRIT is a composite tribe made up of Mohave, Chemehuevi, Hopi, and Navajo people. The only formal group of elders of the reservation are The Mohave Elders Standing Committee (Klasky 1997). The CRIT Reservation is nearest to proposed route C.

The River Tribes' economy revolves around agriculture, recreation, government and light industry. The fertile river bottom lands and available water allow irrigated agriculture which produces cotton, alfalfa, wheat, feed grains, lettuce and melons. Approximately 84,500 acres are now under cultivation and another 50,000 acres are available for development. The tribes hold the senior water rights to 717,000 acre feet of the Colorado River, which is almost a third of the allotment for the state of Arizona.

Fort Mojave Indian Tribe

The Fort Mojave Tribal Constitution was approved in 1957. There are no individual allotments of land in the Fort Mojave Reservation, and the resources are controlled by the five-member Tribal Council. Their long occupancy along the Colorado River gives the Fort Mojave earliest priority on water allocation, a right won in the case of Arizona vs. California ("Aha Macave/Fort Mojave History" nd). The Tribal Court oversees all contracts between outside entities and the Tribe. The Fort Mojave tribal government consists of a Tribal Council with five members, a chair, and a vice chair who are elected into office by the community ("The People by the River" nd.).

During the 1960s, it became possible to lease reservation lands to development lands and large-scale farming operations, which continues to be a good source of income for the tribe (Sturtevant 1978). Most income in recent years is earned through land lease, retail, development of resources, and farming to a lesser degree. About 13,000 acres of tribal land are currently leased, and about 3,000 acres are used by tribal members to farm alfalfa and cotton. The current population was estimated to be about 1000 in 1997, and appears to be increasing (Arizona Department of Commerce: Community Profile 1996). The prosperity of the Fort Mojave Indian Tribe may soon be further boosted by the development of a stretch of resort-casinos and a planned community along the banks of the Colorado: in February, 1997, the tribe opened the Avi Casino, and plans for a second casino are underway ("The People by the River" nd). There are plans to open a resort

Box 3.1. A Proposed Low Level Radioactive Waste Storage Facility for Ward Valley, California

The proposal to build a nuclear waste dump outside of Needles, California has met with opposition from several groups including the Colorado River Native Americans Alliance and the Ward Valley Coalition. One of the concerns about Ward Valley is its potential to become a commercial dump and to begin accepting waste from other places in the country. The proposed site for Ward Valley is 1000 acres that is currently in control of the Bureau of Land Management. The proposal is to have five trenches for the disposal of several classes of radioactive waste. Proponents of the dump contend that the area is needed for waste that is the result of treating cancer patients and other medical research. However, there is a lot of concern about the possibility of most of the waste coming from nuclear power plants. Concern is raised not only for the potential environmental hazards but the land also carries spiritual significance.

According to Mohave creation stories, the land surrounding the Colorado River was given to them by *Masthamo* and as a result that land is their responsibility and their right. The land surrounding Ward Valley is home to the desert tortoise an endangered species and many species of plant and other animals. The Mohaves believe that they have been in that area since "time immemorial," as a result their environment plays a key role in mythology, folklore, and traditional subsistence strategies. The Colorado River has always been regarded as an integral part of Mohave life and "siting a nuclear waste facility in our traditional homeland will kill our use of these areas to perpetuate our living history". Ward Valley is eighteen miles from the Colorado River which provides water for both drinking and crop irrigation (Klasky 1997).

hotel and casino on the Nevada part of the reservation which would include a forty-acre resort, a 302 room hotel, casino, and two restaurants (statement of opposition from the Colorado River Native Nations Alliance 1995).

A proposal for a nuclear waste dump in Ward Valley, California has created controversy between the Indian Tribes, environmental groups, and the California and U.S. governments. The proposed LLRW transportation route C passes directly over Fort Mojave (see Box 3.1).

Southern Paiute

Southern Paiutes trace their ancestry to the Numic branch of the Uto-Aztecan family. Traditionally, they occupied a broad strip of territory that included many environments (see Figure 3.5), from the hot, dry, desert of the inner canyon through pinyon, sage, juniper and mesquite regions to the high plateaus of the north where spruce and fir grow (Schwartz 1988). According to Paiute beliefs, Paiutes were created within these traditional lands and were given a special sacred responsibility to protect and manage their resources by the Creator. The Southern Paiute term that translates into "sacred land" or "powerful land" is *Puaxantu Tuvip* (Stoffle and Dobyns 1982).

Among the most important places within these lands is *Nuvagantu,* or Charleston Peak. Located within the Spring Mountains in southern Nevada, *Nuvagantu* is the place

where Southern Paiutes were created and is the heart of the "storied land" (Kroeber 1970, Laird 1976, Stoffle and Dobyns 1983). Concerns for this sacred area continue to be expressed by Paiutes during cultural resource assessments (Stoffle and Dobyns 1982, Stoffle, Evans, and Harshbarger 1988). In Southern Paiute origin stories, Creator Coyote and Wolf live on Charleston Peak (Laird 1976). Slightly different versions of the story exist among Southern Paiute tribes and bands (e.g., Laird 1976 for Chemehuevi, Lowie 1924 for Shivwits, and Sapir 1930 for Kaibab), each highlighting the sacredness of the tribe's local area (Bunte and Franklin 1987).

According to archaeologists, Southern Paiute people entered the Great Basin by at least 1150 A.D. (Euler 1964, Shutler 1961). In aboriginal times, the Southern Paiute nation was organized into several political units, including possibly two or more major subdivisions of subtribes, a dozen or more districts, each with their own political leadership, and numerous local groups within each district. These local groups are sometimes referred to as bands. The western group, the Chemehuevi, were strongly influenced by the Mohave, and the eastern group, the San Juan Paiutes, were the only ones to occupy territory east of the Colorado River. Pan-Southern Paiute gatherings have been observed since the first Euroamerican contact, especially in connection with the Cry, or mourning ceremony (Sapir 1912, Kelly 1964).

Southern Paiute bands were generally economically self-sufficient in their territory. They combined cultivation with hunting and gathering strategies to meet their needs for food. Water occurred at only a few places within their territory and therefore was a principal factor in the organization of territories and group movements (Austin 1993). Agricultural methods were shared with and adopted from other native groups. The Kaibab Paiute, for example, appear to have gotten maize and squash from the Pueblos to the south. Pinyon pine nuts, Indian rice grass, and rabbits were principal natural food sources. Trading networks with neighboring groups were also important (Ford 1983). Access to resources outside the traditional territory was arranged through reciprocal use agreements. Those were negotiated and reinforced both religious and secular ceremonial gatherings. Ties between communities were also strengthened by intermarriages (Austin 1993).

The Paiutes' effective adaptation to the often harsh environment of the high plateaus and canyons did not prepare them for contact with Euroamericans, however. Disease episodes and slave raids associated with Spanish activity in Mexico accounted for the deaths of thousands of Southern Paiutes (Dobyns 1982, Stoffle, Jones, and Dobyns 1995, Malouf and Malouf 1945). With the arrival of permanent settlers, the impacts of Euroamerican encroachment on the Southern Paiutes were rapid and dramatic. As for the Shoshones, the organized and strategic settlement of traditional Southern Paiute territory, especially, by members of the Church of Jesus Christ of the Latter Day Saints (the Mormons) was a powerful force that affected the Paiutes through loss of land, denial of access to traditional resources such as water resources, disruption of the local ecology from which the Paiutes acquired their traditional food resources, and the

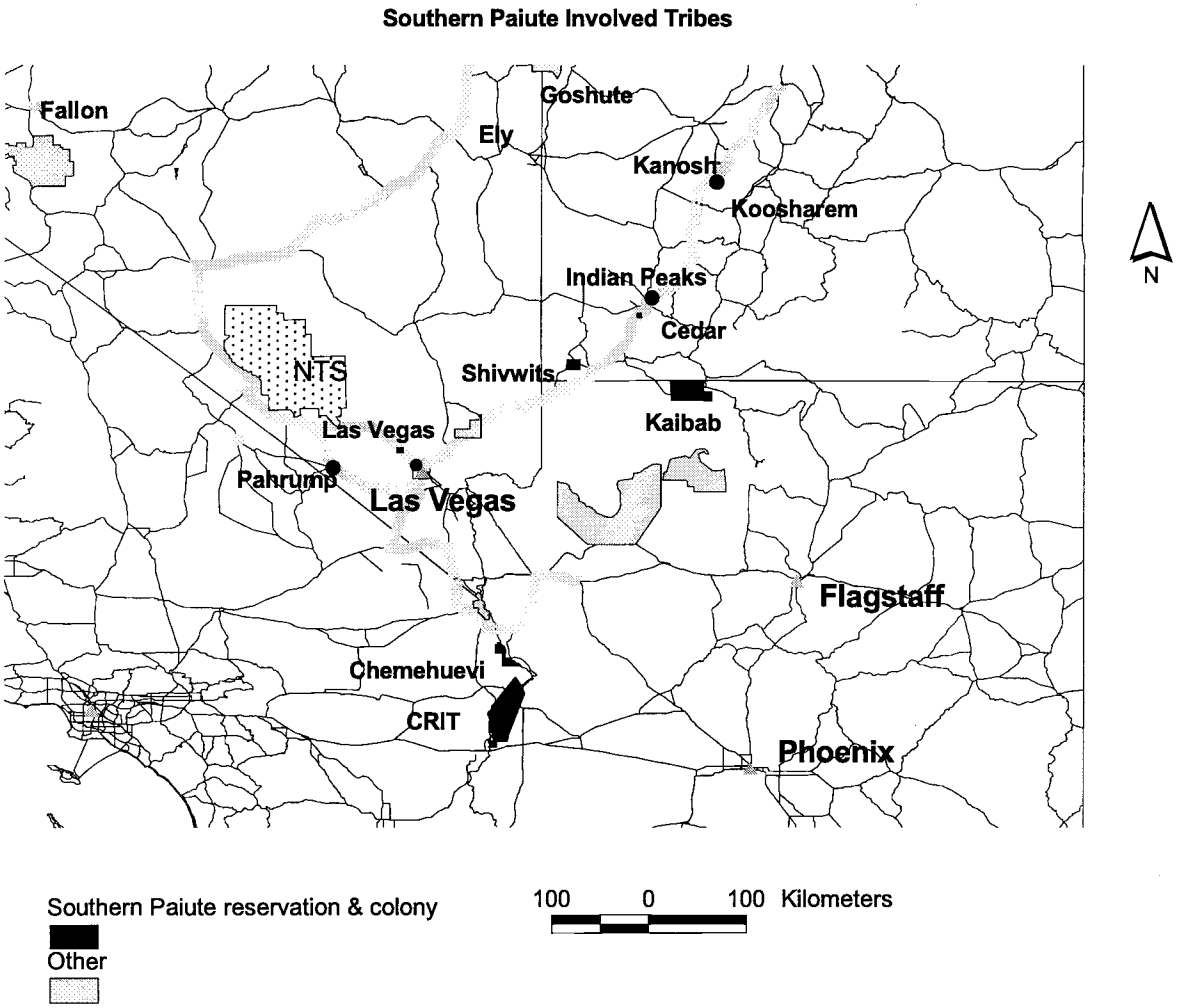


Figure 3.5 Current Location of Southern Paiute Tribes and their Lands

fragmentation of Southern Paiute territory. As cattle grazing became predominant in some areas, pinyon trees were frequently removed from range lands and sensitive plants such as rice grass were quickly destroyed. By 1900, the land had been overgrazed and little vegetation remained.

Interactions Between Southern Paiutes and Federal Government

Of the Southern Paiute bands identified during first contact with Europeans, eleven Southern Paiutes tribes and bands remain distinct today. These groups include

seven federally recognized tribes, one of which is a composite tribe including five bands, and one tribe seeking federal recognition (see Figure 3.5). In addition, the Chemehuevi are one of the four tribes making up the Colorado River Indian Tribes (CRIT; see above).

Official interactions between the Southern Paiutes and the U.S. government did not begin until the mid-1850s. For example, George W. Armstrong was sent to examine Paiute living conditions in 1856 (BIA 1982). Shortly after that visit, the Federal government attempted to consolidate all the Utah Native Americans onto one reservation, which was signed by the Utes, and negotiations with a handful of Southern Paiutes occurred in September 1865 (BIA 1982). These negotiations specified that the Southern Utah Paiutes be moved to the Uintah Reservation and members of the tribe, primarily the signers of the agreement, receive monetary compensation. The treaty was never ratified by the U.S. Senate.

Some individuals working for the U.S. government made additional efforts to establish reserved lands for the Southern Paiutes. For example, a November 1, 1872 report from the Pioche, Nevada Indian Agency with responsibility for Paiutes in southern Utah, northern Arizona, and southern Nevada recommended for the Utah Paiutes a tract of land east of Kanab located in "one of the most fertile valleys in Southern Utah" (U.S. House of Representatives 1873:2). The urging Indian agent also acknowledged receipt of communication from General Crook of Arizona urging that several bands of Paiutes in Arizona and California be withdrawn across the Colorado River into Muddy Valley because they were "not now attached *to* or provided for *by* any agency: they are very destitute [italics in original]" (U.S. House of Representatives 1873: 3). Muddy Valley is the traditional home of the Moapa Paiutes.

In 1873, a special commission headed by John Wesley Powell and G.W. Ingalls was sent to Nevada and Southern Utah to seek reservation sites for the Great Basin tribes (see also Western Shoshone). Powell and Ingalls suggested that the Southern Paiutes be sent to Uintah. However, due to the presence of Ute bands, traditional enemies of the Southern Paiutes, the arrangement was unacceptable. Consequently, due to the lack of other "good" reservation land, the Southern Paiutes were given the choice of moving to the Moapa Reservation in Nevada or doing without (BIA 1982; Fowler and Fowler 1971). Most chose to stay where they were, setting up a pattern that was repeated throughout the period during which reservations were established; members of the various Southern Paiute bands resisted relocation from their traditional territories. As shown in Figure 3.5, Southern Paiutes remained in scattered tribes and bands located throughout their aboriginal lands. The distinction between tribes and bands, and especially the organization of the Paiute Indian Tribe of Utah, are artifacts of U.S. government policy and do not reflect traditional distinctions.

In addition to relocation and placement on reservation lands, Southern Paiutes' use of their traditional lands was restricted by Federal government appropriation of land and resources. For example, when the Grand Canyon and much of the plateau area on either side of it was set aside as the Grand Canyon Forest Reserve in 1893, the Southern

Paiutes were faced with the first of a series of decisions that excluded from the region (see Stoffle, Halmo, Evans, and Austin 1994). Nevertheless, Southern Paiutes have utilized various adaptive strategies to maintain continuity with their traditional uses of resources and to hold their population and culture intact under pressure from Euroamericans. The following sections describe briefly each of the nine Paiute tribes and bands that participated in this study.

Paiute Indian Tribe of Utah (PITU)

The Shivwits, Cedar City, Indian Peaks, Kanosh, and Koosharem Paiutes are all part of the Paiute Indian Tribe of Utah (PITU). However, they began as four separate tribes, all of which were terminated in 1954 (67 Stat. B132 (1953)). After individuals and groups worked to demonstrate the inappropriateness of termination for the Utah Paiutes, Congress passed the The Paiute Indian Tribe of Utah Restoration Act (PL 96-227; Bureau of Indian Affairs 1982), restoring Federal recognition to the Paiutes as members of a single, composite tribe. The PITU is governed by a five member Tribal Council and Chairperson. One member is elected from each of the five bands and the chair is elected from those five individuals. After the Chair is elected, the band of which that individual is a member elects another individual to represent the band on the Council. The five PITU bands were reestablished after the passage of the Restoration Act (PL 96-227). These lands are nearest the proposed LLRW transportation route B.

Shivwits

The first official U.S. government action on behalf of Southern Paiute people in Utah was the 1891 authorization by Congress for the purchase of lands along the Santa Clara River near St. George for a school. The Secretary of the Interior established a reservation for the Shivwits Band on November 1, 1903. In 1957, the Shivwits Tribal constitution was terminated and the people left with other than marginal lands in their possession. At the time of termination, the Shivwits tribe had 26,680 acres of land. Of the five bands of PITU, only the Shivwits still possessed a significant amount of land when the tribe was restored to Federal Recognition Status. Today, the Shivwits Band has 189 members and 26,680 acres of land (Bureau of Indian Affairs 1982).

Cedar City

In 1899, the U.S. federal government appropriated funds to buy land for the Cedar City Paiutes. However, no land was ever purchased with that money, and the Band lost all land to Mormon settlers. In 1915, one agent visited Cedar City and recommended that land be purchased for the Paiutes. In 1919, the Cedar Paiutes had 80 acres of land for farming and 5.5 acres on which they lived. In 1925, Congress passed legislation authorizing an appropriation for the purchase of nine lots in Cedar City for the Paiutes, but no action was taken. The Mormon Church moved the Paiutes to church property and burned their homes and belongings. After the move, no land was purchased for the Paiutes, and the Federal appropriation was returned to surplus in 1928. With the

organization of PITU, the Indian Peaks Paiutes came under Federal recognition for the first time. Today, the 138 members of the Cedar Band occupy a village within Cedar City covering approximately 5 acres of land (Bureau of Indian Affairs 1982).

Indian Peaks

The Indian Peaks Reservation was established by Executive Order on August 2, 1915. It was enlarged in 1921, 1923, and 1924. During the 1940s, the Indian Peaks Paiutes moved into Cedar City and most settled in the Indian village there. The tribe currently has subsurface rights to approximately 8,960 acres of land, and the group consists of approximately 30 band members (Bureau of Indian Affairs 1982).

Kanosh

In 1919 and 1920, the Kanosh Indians received land in twelve allotments. The Kanosh Reservation was established adjacent to the allotments in February 1929 as the last reservation to be formally established in Utah. The reservation was expanded in 1935, but by that time the Paiutes had lost half the water rights they had held between 1853 and 1930. The reservation was again enlarged by Congress on May 28, 1937. After reorganization, the Kanosh Reservation was established to include 895 acres of land in central Utah (Bureau of Indian Affairs 1982). A total of 74 individuals are enrolled in the Kanosh Band.

Koosharem

In 1904 and 1913, four hundred acres of land were included in allotments that had been filed by the Mormon church for Koosharem Paiutes. The Koosharem Reservation was established adjacent to the allotments in 1928, and it was enlarged in 1937. The Sevier Stake, the local branch of the Mormon Church, held control of the Koosharem and was the trustee of their water rights until 1958 when the Paiutes sued for those rights. Under the Sorenson Lease of 1969, the Sevier Stake leased land in Richfield, Utah to provide homes and garden plots for the Paiutes. Today, there are 85 enrolled members of the Kanosh Band, and they have 280 acres of land in central Utah (Bureau of Indian Affairs 1982).

Kaibab Band of Paiute Indians

The impacts of Mormon settlers on the Kaibab Paiutes, beginning in the 1860s, included appropriation of key water sources and establishment of a cattle business that severely affected the native ecology. Nevertheless, the Kaibab Paiutes received little attention from the Federal government in the nineteenth century. The U.S. government began appropriating money to the Kaibab Paiutes in 1906 to meet some of the basic needs of the people. On October 16, 1907, an order of the U.S. Department of the Interior designated for the tribe a 12 by 18 mile reservation in the region of Northern Arizona known as the Arizona Strip. The reservation was officially established by an executive order of Woodrow Wilson on June 11, 1913 when the land was removed from Mormon

ownership and placed under Kaibab Paiute-Federal control. The Reservation was twice reduced in size, once for Mormons and once for the National Park Service. Problems with maintaining control over both their reservation lands and water have continued into the present (Knack 1993).

The Kaibab Paiutes formed a tribal council under the provisions of the Wheeler-Howard Act in 1851. (Euler 1972). The tribe's constitution and bylaws were approved by the Secretary of the Interior on May 29, 1965 (Knack 1974). The present government is a tribal council run by a chairperson and five members. Members are elected at an annual meeting in October; they have typically been drawn from the major families living on the reservation. Decision making can best be described as consensual. The extended family and larger kinship network still are the primary mode of intercommunity interaction and are important in both the social and economic arenas. Interactions with non-Indians in communities surrounding the reservation is generally limited to individuals employed or attending school there. Job discrimination and social isolation of members living on the reservation remain problems that have proved difficult to overcome (Hoffman 1990). Despite federal economic in the 1960s and 1970s, residents of the reservation received little economic or social benefit.

Approximately 350 individuals presently live on the Kaibab Paiute Reservation. The Kaibab Paiute economy is centered around tourism and agriculture. Eighty percent of the employed persons on the reservation work for the tribal government while the remaining twenty percent work off the reservation or in private industry (www.azcentral.com/depts//indian/ profile07). Several efforts have been made to promote economic development, but lack of employment opportunities remains a key factor in individuals' decisions to move off the reservation for both brief and extended periods of time. A decision in the late 1980s to consider siting a hazardous waste incineration facility on the reservation created considerable conflict within the tribe and surrounding communities (Austin 1993). During that study, Kaibab concerns about the atomic testing at the Nevada Test Site were high due to the continuing experience with cancer and death attributed to the radioactive fallout at that time and the activity surrounding the Radiation Exposure Compensation Act (PL 101-426, 104 Stat. 920), known as the "downwinder" legislation. The Kaibab Reservation is nearest to proposed transportation route B.

Las Vegas Paiute Tribe

The Las Vegas Paiute Tribe has two plots of land, one within the Las Vegas city limits and one located one mile north of Las Vegas within Clark County, Nevada. On April 17, 1912 the tribe purchased 10 acres of land. On December 2, 1983, a total of 3,840 acres of land was added. In terms of acreage today, the Las Vegas Paiute Tribe holds 3,850 acres of Tribal land (www.itcn.org/tribes/lasvegas).

The Las Vegas Paiutes were organized under the Indian Reorganization Act June 18, 1934. On July 20, 1970, the Constitution and By-Laws of the Las Vegas Paiute Tribe

were approved. Today, there are approximately 219 tribal members, 140 of which currently live on the reservation (www.itcn.org/tribes/lasvegas).

Members of the Las Vegas Tribe have close ties with the Chemehuevi; they were separated 150 years ago when the Chemehuevi moved to the Colorado River area south of the Mohave people. Although they have separate tribal organization today, some Chemehuevi still live in the Las Vegas colony, and many are related to Las Vegas residents. The Las Vegas people also have close ties with the Moapa band, their eastern neighbor. Route B crosses the Las Vegas Paiute Reservation near Charleston Peak.

Pahrump Paiute Tribe

The Pahrump Paiutes are located in Southern Nevada near the Spring Mountains and the sacred *Nuvagantu*, or Charleston Peak. Unlike the other Paiute groups, the Pahrump are not a Federally recognized Indian tribe. They began a petition to the Bureau of Federal Acknowledgment, seeking Federal recognition, in the late 1980s and are still preparing documentation for their case.

While the Pahrump Paiutes do not have an official land base, 45 of the approximately 100 members reside in and around the town of Pahrump. Otherwise, there appear to be small pockets of Pahrump dispersed throughout the region. The Pahrump Paiutes are the closest group in proximity to sacred Mt. Charleston, and Pahrump stories are consequently distinct because of this locational factor. As with other cultural groups, the stories themselves manifest the importance of this sacred site.

References to the Pahrump Paiutes in early literature are quite common. The earlier works by Powell, for example, mention the Pahrump people and Chief Tapoka at Ash Spring (Fowler and Fowler 1971). In contrast, the Pahrump are not referenced as often in recent literature due in part to their lack of formal organization as a tribe (personal communication, Richard Arnold, 1997). Nevertheless, the Pahrump people participated in the Southern Paiute Indian Claims Commission judgment in 1968.

The Pahrump people speak the same language as the rest of the Southern Paiutes, although they share a slightly different dialect. Their interaction with other Southern Paiutes is mostly focused on the Las Vegas and Moapa tribes and is reflected by the degree of intermarriage between groups. Other Pahrump ties include connections with the CRIT and Southern Chemehuevi. Pahrump is closest to the Nevada Test Site; route C passes through Pahrump, and routes A and B pass close by.

Moapa Band of Paiute Indians

The Moapa Paiute Reservation is located in Nevada, eight miles west of Glendale and approximately 55 miles northeast of Las Vegas. On March 12, 1873, the Moapa people were granted approximately 2 million acres by Executive Order. The following year on February 12, over 1,000 acres were added to the reservation by Executive Order.

By the authority of the Act of March 3, 1875, the reservation was reduced to 1,000 acres. One century later, on December 2, 1980, 70,000 acres were added by for economic development. Today, the Moapa Paiute Reservation encompasses 71,954 acres of Tribal land (www.itcn.org/tribes/moapa.html).

The Moapa Paiutes were organized under the Indian Restoration Act of June 18, 1934. The Constitution and by-laws of the Moapa Band of Paiute Indians were approved April 17, 1942. The Tribe has 163 enrolled members and is governed by a five member Council and Chairperson. A major economic development project is the Tribe's casino and smoke shop. The Tribe is presently working to revitalize the Tribal farm and greenhouse. Proposed LLRW route B crosses the Moapa Reservation.

Chemehuevi Paiute Tribe

The Chemehuevi are a River Yuman tribe related to the Southern Paiute. The Chemehuevi language is in the Uto-Aztecan language family. In their own tongue, Chemehuevi refer to themselves as *Tantawats*, which means "southern men."

At one time, the Chemehuevis resided in the eastern portion of the Mohave Desert and dwelled in small huts, shelters that were covered with dirt and low to the ground. Chemehuevis were successful hunters and gatherers known for their excellent basketry. When they settled along the Colorado River, the Chemehuevi were influenced by the Mohave and Yuma Indians. For example, although the Chemehuevi continued to make baskets, they also began to fashion pottery vessels in the style of the Mohave. Males also mimicked the Mohave hair style, rolling it in thin "ropes" that dangled down their backs. They adopted the use of log and tule rafts, and the manner by which Yumans carried goods and children across the river in large pots. Their religion began to take on Mohave features, such as the sing song cycles which told of mythological events, in the Mohave way. The Chemehuevi shaman found his power to cure from dreams, much like the Mohave shaman (www.themall.com/Tribes/colorado.htm).

The Chemehuevi Indian Reservation is located between Parker, Arizona and Needles, California and was established on February 2, 1907. After construction of Parker Dam on the Colorado River, completed in 1938, all of the cultivatable land was flooded by the waters of Lake Havasu. Only one Chemehuevi Indian remained on the reservation. The river bottom lands, totaling 7,776 acres, were sold to the Los Angeles Metropolitan Water District in 1950 and deeded back to the Federal government for control. The Chemehuevi were paid $108,342 for the eleven allotments within the river bottom area. The remainder of the reservation, approximately 28,000 acres, was not arable without costly irrigation facilities. Since 1950, the Chemehuevis have returned to the reservation and many improvements have been made to the roads, houses and administrative structures on the reservation. The reservation is nearest to proposed LLRW transportation route C.

Colorado River Indian Tribes (see Mohave)

Environmental Concerns of the Participating Tribes

At the interim project meeting on August 20, 1997, AITC members and tribal representatives made a series of suggestions for expanding the Transportation Study. One recommendation was that the transportation of low-level radioactive waste must be contextualized within the other critical environmental threats facing the participating tribes. In the two-year span of the project, interviews revealed that the concerns of many tribal members regarding the transportation of LLRW were dampened by what they considered to be more pressing environmental factors that threatened their way of life. Others noted the transportation of LLRW was one of a growing number of threats facing their tribes and therefore of greater concern than if it were happening in isolation. While Chapter Five deals explicitly with the perceptions of individual tribal members, the recommendations flowing from the August 20 meeting led to a supplemental Tribal Survey that included fieldwork to gather data on the environmental concerns of the participating tribes.

The transportation of low level radioactive waste is *perceived* by tribal members to have potential effects on the environment and those who interact closely with it. However, responses to the proposal to transport low level radioactive waste on or near tribal land are influenced by awareness of other threats to the environment and the traditional way of life. The following section briefly describes the threats that were identified by both the leadership and individual members of the participating tribes. This information is provided as a background against which to view the concerns of individual tribal members as described in Chapters Four and Five.

Environmental Concerns of the Western Shoshone People

The traditional territory of the Western Shoshone people spans much of Nevada, and includes parts of the surrounding states. The reservations and colonies of the Western Shoshone people are scattered across their aboriginal territory. Because the reservations vary so much in their proximity to towns, freeways, mines, and military spaces, each tribe faces a unique set of environmental circumstances. Despite this variety, the interviews with individual tribal members and with tribal representatives reveal several patterns worthy of mention.

Mining and mining related activities continue to represent a major threat to many of the Western Shoshone tribes and bands. Mining activities in northern Nevada constitute an significant amount of business to the communities of the area. Large percentages of the population, both native and non-native are employed in this industry. During an interview at the offices of the Battle Mountain Band of the Te-Moak Western Shoshone, the tribal chairman and tribal administrator were able to name twelve active mining operations in the area, not including the smaller operations characteristic of the area. Similarly, the Chairman and Administrator of the Te-Moak Bands Council described the significant demands on their time that were being made to participate in

environmental assessments of new mining activity. Most of the other Western Shoshone report similar concerns.

Large scale mining often creates large open pits, disturbing the Western Shoshone aboriginal territory and threatening the cultural resources present there, including plants, animals, and sacred sites. Many of the Western Shoshone are also concerned that the slag and tailings from these mines might contaminate their water supply. In addition, many of the reservations are located near major trucking routes. The gold mines in the area require a constant supply of cyanide for the leaching process: the possibility of accidents and spillage of these highly toxic chemicals is a constant threat to many of the tribes. Many of the people interviewed recall the occurrence of just such accidents. In Ione Valley, the gold mines have chemical runoffs which reach ten miles into the valley. The result is a discoloration of the land affected by the toxins used to mine the precious metal. Both the transportation and storage of these toxic chemicals represent a significant threat to the Western Shoshone people.

As the self-governing responsibilities of the Western Shoshone tribes continue to expand, many are also facing problems related to the storage of solid waste. This multi-faceted problem includes issues of dumping on Indian land, cleaning up pre-reservation landfills, establishing programs for dealing with solid waste generated by tribal members, and fortifying relationships with city and county solid waste sites. Meeting the needs of these various problems requires significant bureaucratic effort from tribal administrations that are often already overburdened with duties.

Several of the Western Shoshone tribes report ongoing concerns with military activity near tribal land. The primary concern rests with flyovers. The airplanes generate sonic booms and disturb both the tribal members and the wildlife found in hunting and gathering areas.

In the Yomba cattle grazing allotment, helicopters have been seen chasing the cattle and horses out on the range. Similarly, parents at Yomba and Duckwater report that children have become frightened by aircraft "dive bombing" homes and causing windows and foundations of old buildings to crack.

Coupled with increased population growth in communities near the reservations (see below), the aircraft noise and disturbances were credited with causing changes in populations of sensitive species such as the bighorn sheep (*Ovis canadensis*) and sage grouse (*Centrocercus urophansianus*). Several of the interviewees reported concerns with the possibility of future land expansion of the military sites.

Finally, the tribal administrators report difficulty in communicating with the military administration. They feel they are not informed by the military of plans and changes in policy.

In addition to the U.S. military, several Federal agencies are involved in activities that potentially threaten Western Shoshone lands and lifestyles. The Northern tribes interact with officials from the DOE regarding the Idaho National Engineering Laboratory (INEL) as well as the Nevada Test Site.

Recent decisions to store high level nuclear waste from overseas, and the shipment of that waste near the Western Shoshone tribes, from California through Nevada and Utah on the way to Idaho, began without the preparation of an Environmental Impact Statement and occurred during the course of the Transportation Study. The news that waste was being shipped highlighted tribal mistrust and concern about lack of information (see Box 3.2).

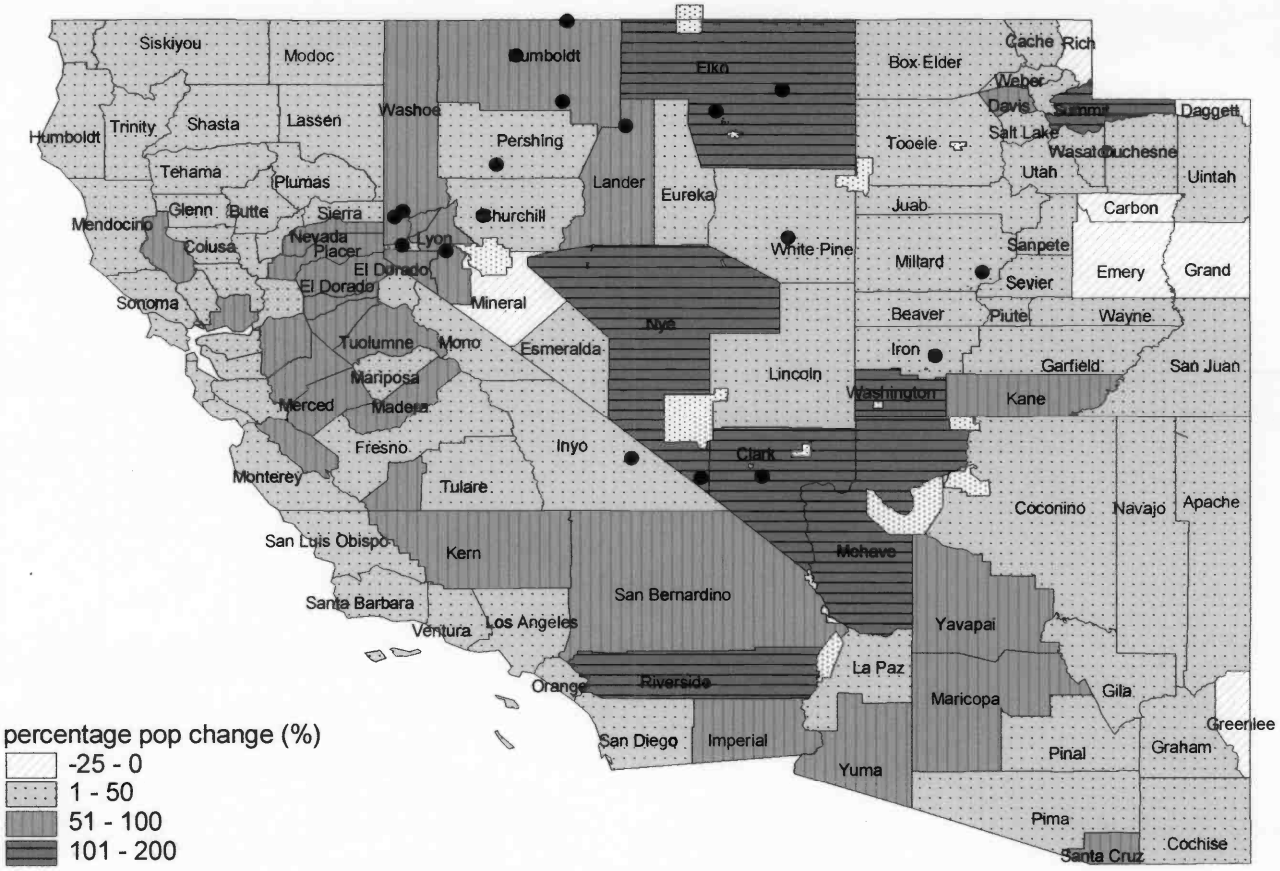
The tribes and bands near towns also report increased concerns about the effect of population growth and development (see Figure 3.6). Those Western Shoshone with reservations in or near towns (Battle Mountain Colony, Elko Colony, Ely Tribe) display a heightened awareness of this problem. They report difficulty obtaining adjoining land, and several of the tribes feel that the Euroamerican-dominated city councils actively seek to prevent their growth: both the Ely Tribe and the Battle Mountain Colony reported that city councils used economic development projects to prevent the expansion of tribal landholdings. Even those tribes located some distance from major towns report and increase in allotments and settlement in the areas around their reservation. In addition, several tribal members reported the difficulties they had begun to have in finding places to gather medicine plants and pray. They described changes from earlier times when they were able to go onto Federal lands without seeing or hearing anyone to the present when they see and have to contend with campers, off-road vehicle traffic, and recreationists.

This summary of the environmental threats and concerns facing the Western Shoshone people deals with some of the major issues directly affecting the tribal members and their reservation land. Many of the Western Shoshone people interviewed for this project, however, were careful to note that their concerns went far beyond the boundaries of their reservations. Traditional Western Shoshone territory stretches from California to Utah, and the Indian people participating in the interview often clarified the point that they remain dedicated to the environmental and spiritual integrity of the entire aboriginal territory. In this aspect, they are a united people: building a powerplant, a waste facility, or a gold mine on a remote parcel of Western Shoshone aboriginal land is a concern for all Western Shoshone people, not just to the nearest tribe. This sense of stewardship surfaced again and again in the interviews conducted for this study.

Environmental Concerns of the Goshute People

In late December of 1996, the Skull Valley Goshute Tribe signed an agreement to lease 50 acres of on-reservation land to a company wishing to store high level nuclear waste there. The Skull Valley tribe began considering housing the facility in the early 1990s (Associated Press 1992). The company wishing to store the waste, Private Fuel Storage, Inc., is a group of 11 nuclear plants. The decision to accept the storage facility

Population change 1980 - 1996



Population change 1990 - 1996

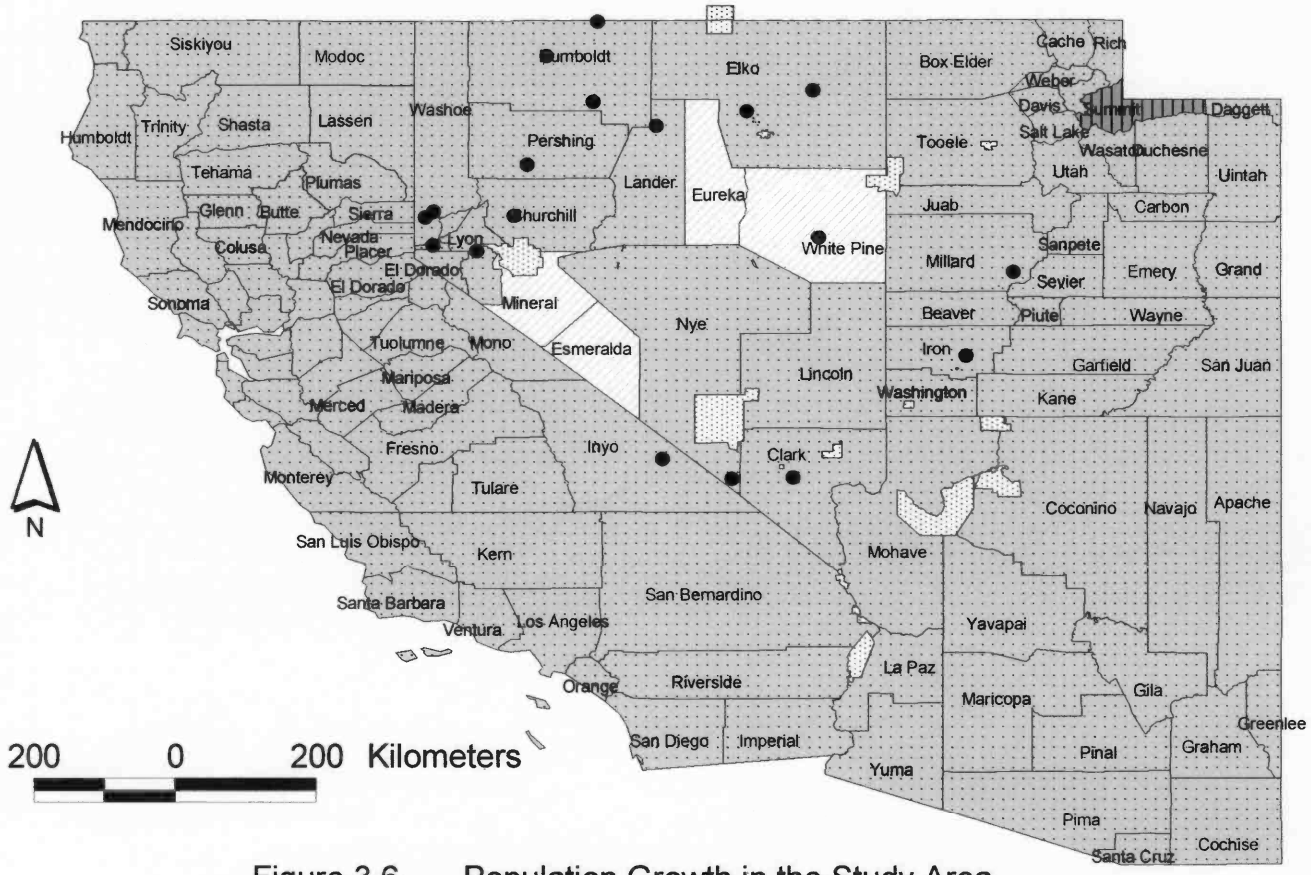


Figure 3.6 Population Growth in the Study Area

was heavily criticized by the government of Utah and other Goshute and Western Shoshone people. On April 15, 1997 the governor of Utah, Michael O. Leavitt, issued a public declaration actively opposing the Skull Valley decision to house high level radioactive waste on the reservation. The Skull Valley Tribe has produced a document that explains the efforts taken by the Tribe to evaluate the safety of temporary storage of high level nuclear waste. One of the striking aspects of that report is the argument that the storage of high level nuclear waste on the Skull Valley Reservation is perceived by the tribal leadership to be less hazardous to the environment or tribal members than a myriad of facilities and activities that presently surround the reservation and over which the Tribe has no control. Such facilities include a hazardous waste incineration facility, a U.S. Army facility that handles biological weapons, a chemical weapons (nerve gas) incineration facility, and a low level radioactive waste disposal facility, all of which have been noted for releasing toxic materials to the environment (see also Box 4.1).

Box 3.2. Idaho National Engineering Laboratory

The Idaho National Engineering Laboratory (INEL) is an 893-square mile federally owned reserve in the eastern Idaho desert. The INEL is the site of many research and test reactors and of the Idaho Chemical Processing Plant, where spent nuclear fuel from the U.S. Navy and from research reactors was reprocessed (DOE 1996). During the Transportation Study, issues surrounding the transportation of radioactive materials to the INEL received national attention. Particularly, Nevada state and tribal officials reacted negatively to the announcement that a shipment of high-level nuclear waste from Taiwan, Korea, and Japan was to travel via rail and/or trucks from Concord, California to INEL (Chereb 1997). This event illustrated the difficulties faced by the tribes and colonies in this who must deal simultaneously with two distinct offices of the DOE. Participants in the study generally expressed a desire for a more coordinated response from the agencies of the U.S. government.

The Confederated Tribes of the Goshute Reservation participated in all phases of this Transportation Study. Their environmental concerns also are formidable. Much like their Western Shoshone neighbors, the Tribe is concerned about the effects of gold mining operations on Goshute land and resources. The use of cyanide and the tailings created in the mining process is perceived as a threat to the water supply of both humans and animals. Because the Goshute tribal members are currently seeking to expand their landholding for grazing, the quality of the available water is of particular concern.

The military activities in the area also represent a significant concern to the tribal administration. The Toeele Army Depot continues to store a variety of toxic agents. The Goshute Environmental Officer reports that his uncle was once knocked unconscious while herding sheep by a cloud of black gas. The administration also reports concerns about military flyovers and unexploded ordinance. Beyond the usual concerns about the sonic booms generated by aircraft, tribal leaders report a history of midair collisions, falling debris, and jet-fuel rain resulting from mid-air refueling. Unexploded ordinance are found throughout the Goshute people's traditional hunting and gathering area.

Because of its remote location in the Deep Creek Mountains, ranchers both on and off the reservation require periodic shipments of propane gas. The steady traffic of such flammables is an ongoing concern of the tribal leaders, for the road to the reservation is a difficult one. Finally, the tribe is currently seeking solutions to solid waste storage issues – a particularly strong concern for such a remote tribe.

Environmental Concerns of the Mohave People

Although the Mohave tribes reported a number of concerns, the issue that was mentioned so frequently that it receives special attention here is the proposed low level radioactive disposal facility at Ward Valley, California. The proposal for a nuclear waste disposal facility in Ward Valley has created controversy between the American Indian Tribes of the area, environmental groups, and the U.S. and California governments. Five lower Colorado River tribes, including the Fort Mojave, Chemehuevi, CRIT, Quechan, and Cocopah First Nations, have established the Colorado River Native Nations Alliance to show united opposition to the Ward Valley radioactive waste repository. In addition, the Fort Mojave Tribal Council Resolution 95-100, passed November 11, 1995, declaring the Fort Mojave Indian Reservation a nuclear free zone and prohibiting all nuclear activities within the exterior boundaries of the Reservation (see Appendix I). The Mohaves believe that they have been in that area since "time immemorial;" as a result, their environment plays a key role in mythology, folklore, and traditional subsistence strategies. According to Mohave mythic stories, the land surrounding the Colorado River was given to them by Masthamo and, as a result, that land is their responsibility and their right. The land surrounding Ward Valley is home to the desert tortoise an endangered species and many species of plants and other animals. The Colorado River has always been regarded as an integral part of Mohave life and "siting a nuclear waste facility in our traditional homeland will kill our use of these areas to perpetuate our living history" (Klasky 1997). The proposed site for Ward Valley is 1,000 acres that is currently in control of the Bureau of Land Management. The proposal is to have five trenches that will be used for the disposal low level radioactive waste. Among the concerns about Ward Valley is that once it has been established as a commercial landfill it will begin accepting waste from other parts of the country.

Environmental Concerns of the Southern Paiute People

The ancestral land of the Southern Paiute People stretches through portions of Arizona, Southern Nevada, and Utah. Their proximity to the NTS has created a long term concern with the effects of radioactive fallout from nuclear testing The Southern Paiute people have expressed a deep concern with this issue high due to the continuing experience with cancer and death attributed to the radioactive fallout at that time and the activity surrounding the "Radiation Exposure Compensation Act," known as the "downwinder" legislation. The transportation of low-level radioactive waste through the traditional territory of the Southern Paiute people can be viewed as another component of their ongoing concern with the Nevada Test Site.

A decision in the late 1980s to consider siting a hazardous waste incineration facility on the Kaibab Paiute Reservation created considerable conflict within the tribe and surrounding communities (Austin 1993). In addition, the Moapa Paiute Indian Reservation is located next to a coal-fired power plant. The effects of this plant on air quality in the area represent a serious and pressing concern for the members of that tribe.

The Southern Paiute tribes located near Las Vegas and St. George also report a growing concern with population growth and its effects. Both of these towns have experienced extremely high growth rates over the last decade. Figure 3.6 illustrates the growth rates by county for the entire region of the study. As this map reveals, the growth rates for both Clark County, Nevada and Washington county, Utah are over 100% for the period between 1980 and 1996. This growth has swallowed many of the traditional hunting and gathering areas of the Southern Paiute people, and places an increasing burden on the water resources of the desert ecosystem. Additionally, the Chemehuevi Tribe, in keeping with CRIT, Ft. Mojave and others located along the Colorado River, mentions potential contamination of the river to be a major environmental concern.

Summary

The history and organization of the participating tribes and their environmental concerns provide a context for understanding the Native American perspective on the transportation of low level radioactive waste to the NTS. The twenty-eight participating tribes and subgroups range in size from 50 to nearly a thousand members and have responsibility for lands ranging from a couple of acres to 113,545 acres. Their governments frequently reflect the U.S. federal ideal more than the manner in which their people traditionally organized and governed themselves. They have been forced to adapt to continually changing government policies from past efforts to dissolve their communities and governments to present policies that give them increasing responsibility for decisions affecting their reservations and their traditional lands while the resources to establish and operate their governments are diminishing. Few of the tribes participating in this study have available to them avenues for economic development, such as casino gambling, that have been so important to many tribes as they seek to raise the funds necessary to operate tribal governments without the ability to levy property taxes.

Beyond their concerns about the transportation of low level radioactive waste, the tribes participating in the study face a variety of other environmental concerns. Issues surrounding the mining industry dominate their concerns, particularly for those tribes located in Nevada. Military flyovers and related activities were often reported as concerns, and the storage and/or incineration of hazardous materials by the military represents a significant threat in the minds of many Indian people. Population growth and economic development projects continue to infringe on the hunting and gathering areas of the participating tribes, making it more difficult to preserve their traditional ways of life.

As these concerns continue to grow, many of the tribes are now enmeshed in the process of establishing programs to deal with on-reservation solid waste storage, water issues, and clean-up of abandoned dump sites. The instigation of any transportation plan for low level radioactive waste must be understood in the context of these other environmental issues facing contemporary tribes in the region.

CHAPTER FOUR: INTERVIEW RESULTS - OVERVIEW

Diane Austin, Andrew Gardner, Eylon Shamir

All twenty-eight tribes and subgroups and the Las Vegas Indian Center were contacted by the DOE/NV and then by BARA researchers and/or members of the AITC about the Transportation Study. Each tribe agreed to some level of participation in the study. BARA researchers sent the letter drafted by the AITC at the 1996 AITC meetings to each tribal government official prior to the researchers' visit to the tribe. The AITC members received copies of the letters when they were sent so they could keep track of the progress of the study. Phase One Activities at each tribe are summarized in the five steps:

1. DOE notified tribe of study via letter to tribal chairperson
2. BARA/AITC made follow-up contact to tribe
3. BARA sent letter to tribal chairperson describing visit
4. BARA/AITC set up visit and arranged interviews
5. BARA/AITC conducted interviews and met with tribal leaders

Phase One tribal interview visits began in October 1996 and ended in June 1997 and were conducted according to the schedule shown in Table 4.1.

Table 4.1. Schedule of Phase One Visits for Tribal Interviews

1996	
October	Confederated Tribes of the Goshute Reservation
	Skull Valley Goshute
November	Shoshone-Paiute Tribe of the Duck Valley Reservation
	Paiute Indian Tribe of Utah
	Paiute Indian Tribe of Utah - Cedar Band
	Paiute Indian Tribe of Utah - Indian Peaks Band
	Paiute Indian Tribe of Utah - Kanosh Band
	Paiute Indian Tribe of Utah - Koosharem Band
1997	
January/	Paiute Indian Tribe of Utah - Shivwits Band
February	Pahrump Paiute Tribe
	Kaibab Band of Paiute Indians
March	Duckwater Shoshone Tribe
	Yomba Shoshone Tribe
	Ely Shoshone Tribe
	Moapa Paiute Indian Tribe
	Timbisha Shoshone Tribe

1997 (cont.)	
April	Colorado River Indian Tribes - Chemehuevi
	Chemehuevi Paiute Tribe
	Fort Mojave Tribe
	Las Vegas Indian Center
May	Colorado River Indian Tribes - Hopi
	Colorado River Indian Tribes -Mojave
	Colorado River Indian Tribes - Navajo
June	Te-Moak Bands of Western Shoshone Indians
	Te-Moak Bands of Western Shoshone Indians - Battle Mountain
	Te-Moak Bands of Western Shoshone Indians - Elko
	Te-Moak Bands of Western Shoshone Indians - South Fork
	Te-Moak Bands of Western Shoshone Indians - Wells

The Skull Valley leaders chose for their tribe to participate in the study through a meeting with tribal leaders. In March, a visit was made to the Las Vegas Paiute Tribe by a BARA researcher. The tribal chairperson requested that her tribe remain on the list of involved tribes but informed the researcher. The tribal chairperson requested that her tribe remain on the list of involved tribes but informed the researcher that members of the tribe would be unable to participate in interviews.

For each tribe that agreed to participate in interviews, tribal leaders designated individuals to be interviewed. In many cases, the individuals selected were those most accessible; frequently they worked for the tribe. When taken as a whole, the study participants are fairly distributed across age and gender, as shown in Table 4.2.

During the interviews with individual tribal members, information was collected about:

- travel routes
- hunting, gathering, fishing areas
- reaction to transportation of low level radioactive waste
- experiences that influenced reaction to transportation
- expectation of behavior change in response to transportation
- ideas for mitigating negative impacts of transportation

Table 4.2. Distribution of Study Participants by Tribe, Based on Gender and Age

Tribe	GENDER		AGE		
	Male	Female	<35	35-55	>55
Chemehuevi Tribe	4	5	3	5	1
CRIT-Chemehuevi	3	3		4	2
CRIT-Hopi	2	2		3	1
CRIT-Mohave	3	4	1	3	3
CRIT-Navajo	4	3	1	4	2
Duckwater Shoshone Tribe	2	5	2	4	1
Ely Shoshone Tribe	2	4		3	3
Fort Mojave Tribe	3	3		4	2
Confederate Tribes of the Goshute Reservation	3	4	1	4	2
Kaibab Band of Paiute Indians	4	3	1	3	3
Moapa Paiute Tribe	2	4	1	3	2
Pahrump Paiute Tribe	4	2	1	2	3
PITU-Cedar Band	2	3	1	2	2
PITU-Indian Peaks	3	2	1	2	2
PITU-Kanosh	2	4		3	3
PITU-Koosharem	1	5	4	1	1
PITU-Shivwits	6	2		7	1
Shoshone-Paiute Tribes of the Duck Valley Reservation	4	3	2	3	2
Te-Moak Tribe-Battle Mountain Band	1	1	1	1	
Te-Moak Tribe-Elko Band	1	4	1	3	1
Te-Moak Tribe-South Fork Band	2	4	3	1	2
Te-Moak Tribe-Wells Band	0	5	3	1	1
Timbisha Shoshone Tribe	1	4	1	2	2
Yomba Shoshone Tribe	5	2	4	2	1
Other (interviewed at Las Vegas Indian Center)	1	3	2	1	1
TOTAL	65	84	34	71	44

Establishing a Basis for Tribal Concerns

The information about travel routes and hunting, gathering, and fishing areas establish the basis for tribal concerns regarding the transportation of low level radioactive waste transportation along the proposed routes. The map shown in Figure 4.1 summarizes the total frequency with which the various segments of the proposed routes are used by the study participants. This map was created by summing travel by all participants over all routes, translating those routes to sections, and presenting the total frequency of use for each section. The four categories of frequency are relative frequencies; low is less than ten trips per year, medium is more than ten but less than one hundred trips per year; high is more than one hundred but less than three hundred trips per year, and very high is more than three hundred trips per year.

Figure 4.2 displays the same information shown in Figure 4.1, but only the proposed transportation routes are shown. This figure highlights the relative use along the three routes investigated for this Transportation Study. While the maps in Figures 4.1 and 4.2 show overall concern, they do not differentiate among tribes. Also, they only provide

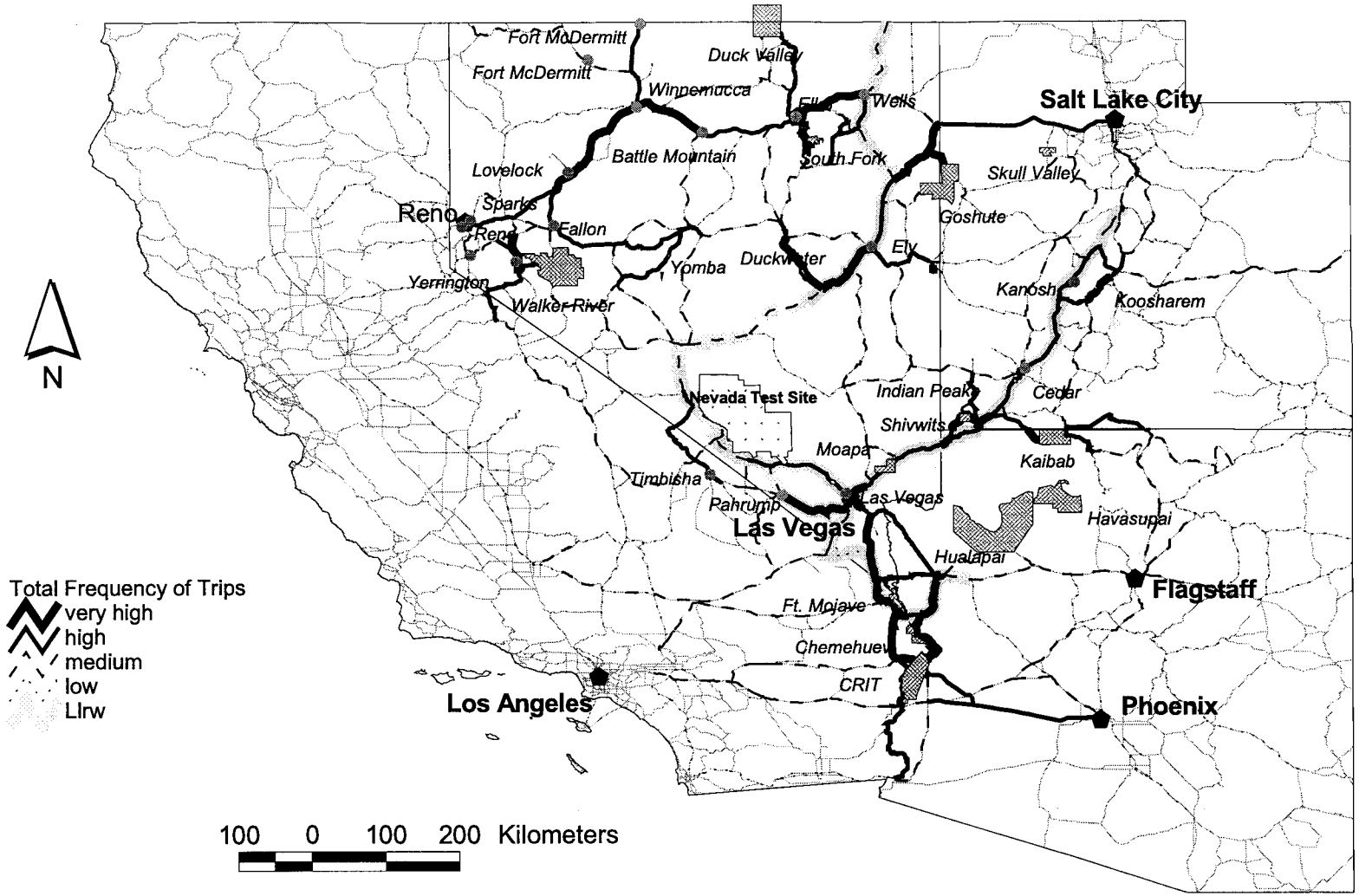


Figure 4.1 Total Frequency of Trips Taken by Participants in Transportation Study Area

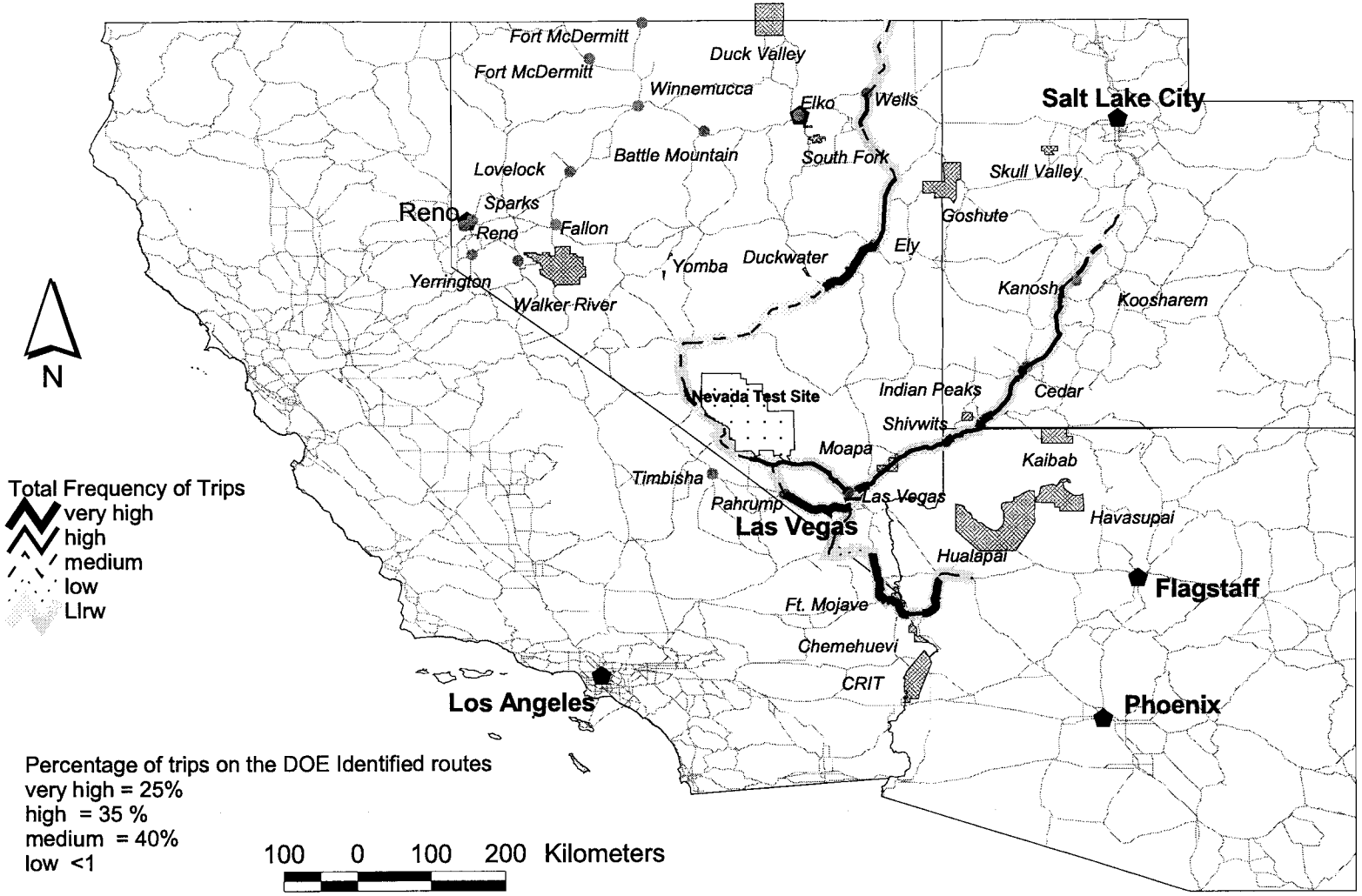


Figure 4.2 Total Frequency of Trips Taken by Participants on the Three Identified Routes

information about how frequently the roads were used by the study participants. Figure 4.3 shows the entrance of the Nevada Test Site, the final destination of the waste shipments.

Figure 4.3 Entrance to the Nevada Test Site

A series of maps was created to demonstrate tribal concerns by combining the travel of all members of each tribe. Two maps are displayed for each tribe and for the Las Vegas Indian Center (see Figures 4.4-4.28). The first map in each pair shows ethnic group use, by frequency of trips, along each segment of the area roads. As described in Chapter Two, the information from all members of each tribe was grouped together and then the individual frequencies were normalized (scaled), based on the number of individuals per tribe. Four categories of frequency include low (less than two trips per year), medium (twice per year up to once per month), high (once per month up to once per week), and very high (once per week or more).

The data also were analyzed to provide information about the number of individuals using each route so that idiosyncracies of individual people will surface. As shown in Figures 4.4-4.28, the results based on the number of people are similar to those based on the number of trips [low (less than one quarter of the individuals), medium (one quarter up to one half of the individuals), high (one half up to three-quarters of the individuals), and very high (three-quarters or more of the individuals)]. However, where the first map provides an indication of the importance of a route because it is used often, the second reflects routes that may be significant because they are used by many tribal members. The routes in the second maps that are used often commonly join tribal communities or lead to places of significance, even though they may be used infrequently. In sum, the data demonstrate that the participating Native Americans have a basis for ethnic group concerns about the proposed routes. Major reasons for travel along the proposed routes include:

- get the staples for daily life: go to work, school, shopping
- follow daily routines such as checking the mail
- obtain medical care
- visit family and friends
- attend funerals, ceremonial gatherings
- do traditional hunting, gathering, and fishing

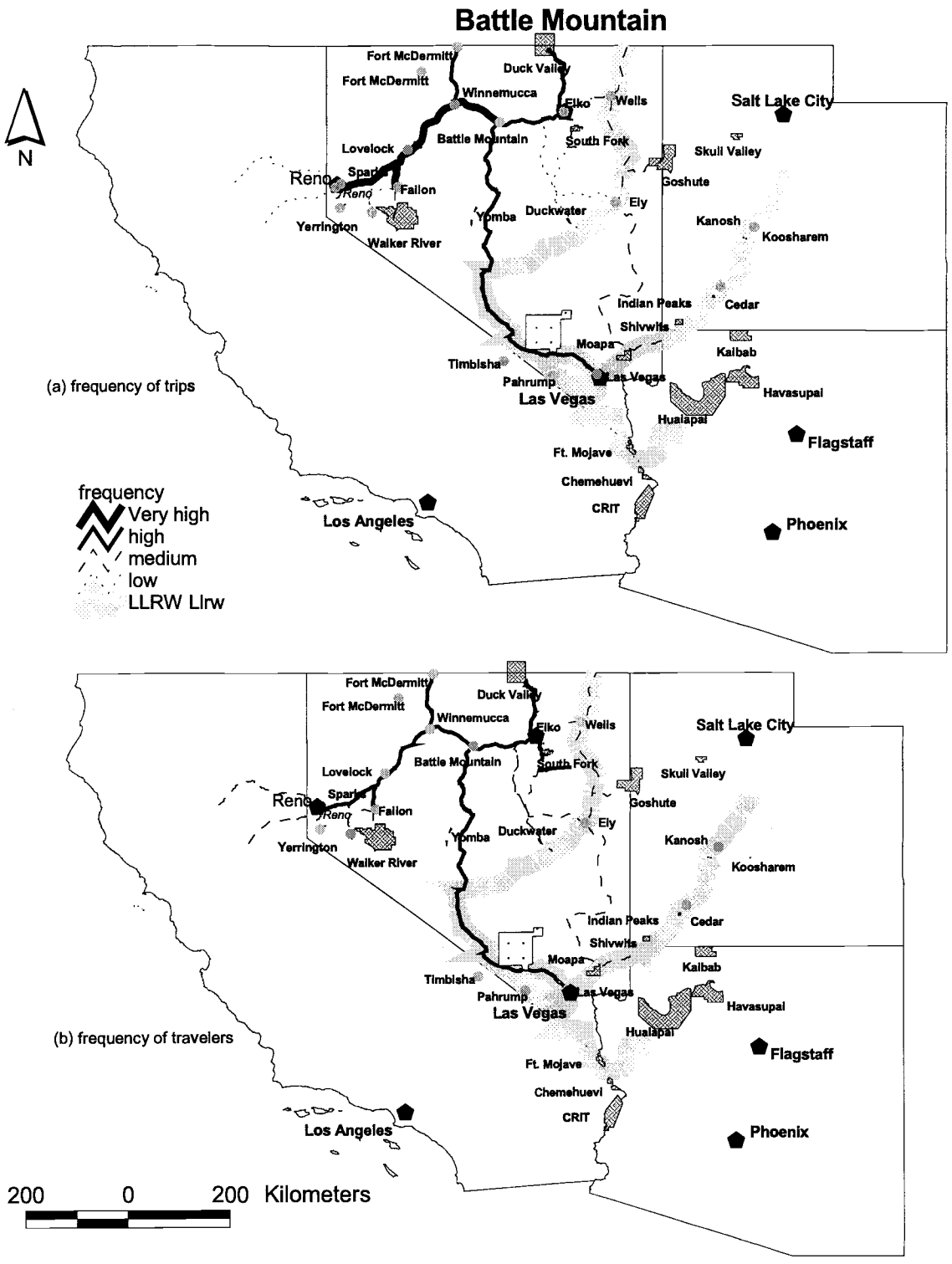


Figure 4.4 Frequency of Trips and Travelers for Battle Mountain Individuals

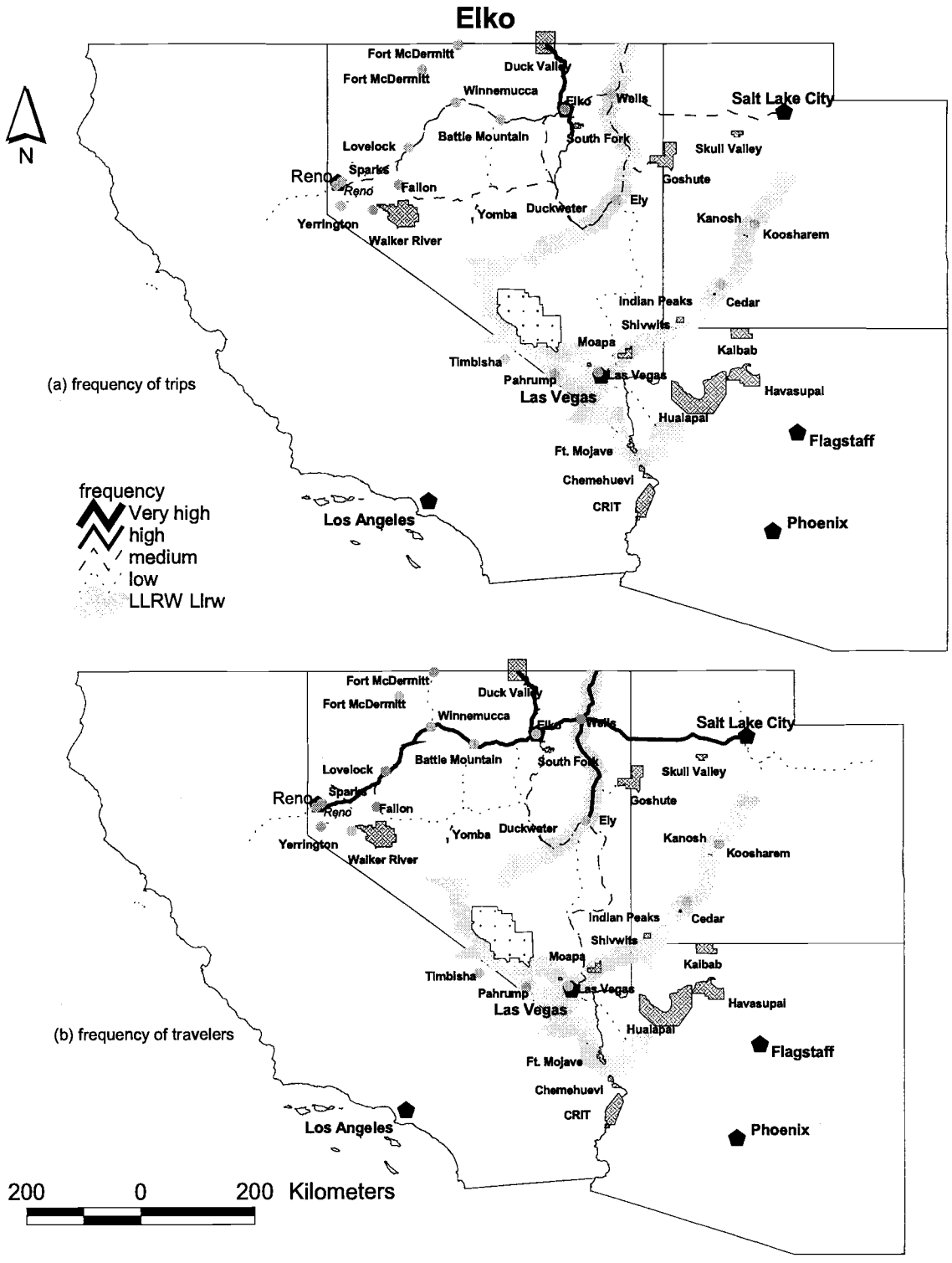


Figure 4.5 Frequency of Trips and Travelers for Elko Individuals

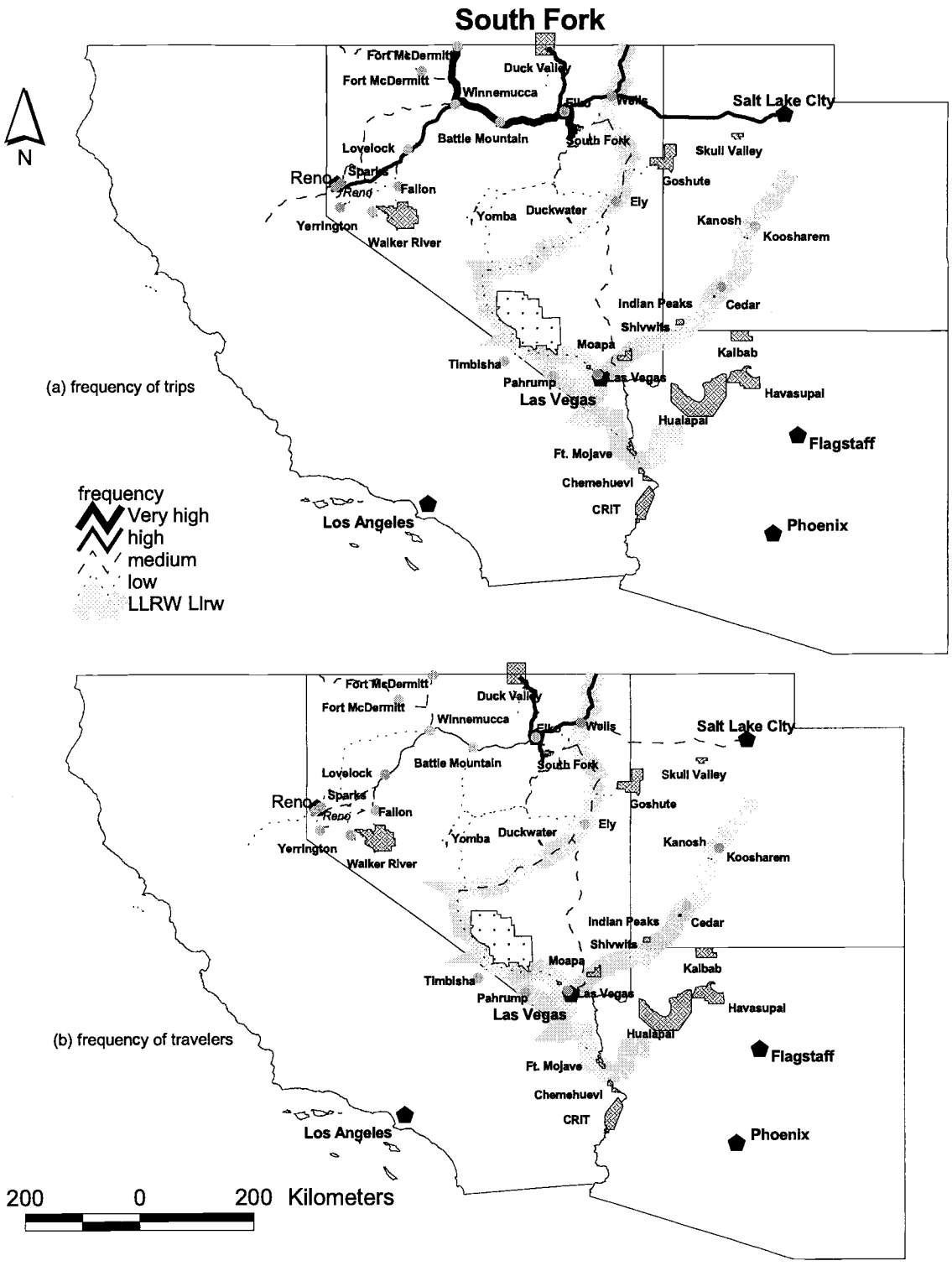


Figure 4.6 Frequency of Trips and Travelers for South Fork Individuals

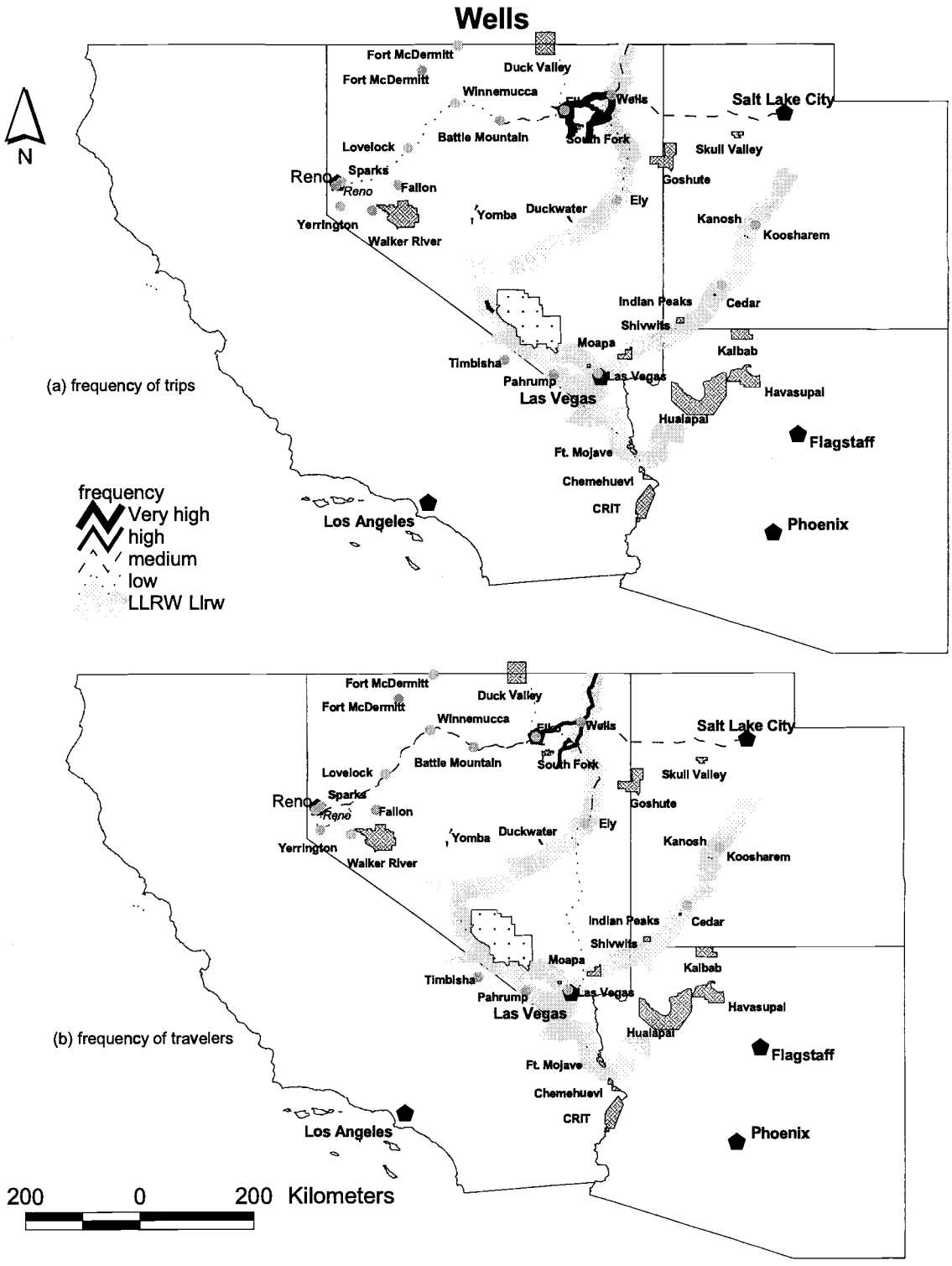


Figure 4.7 Frequency of Trips and Travelers for Wells Individuals

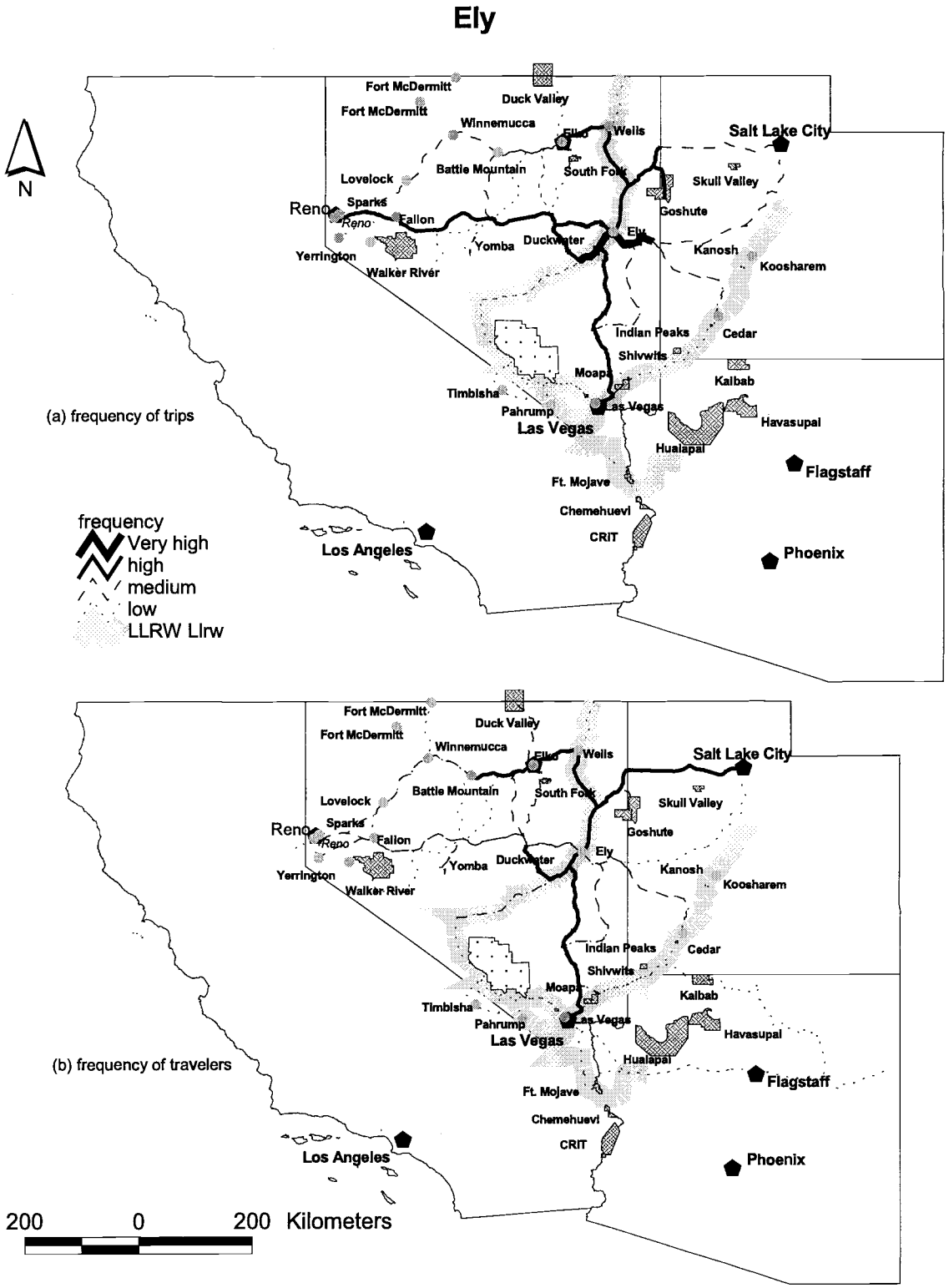


Figure 4.8 Frequency of Trips and Travelers for Ely Individuals

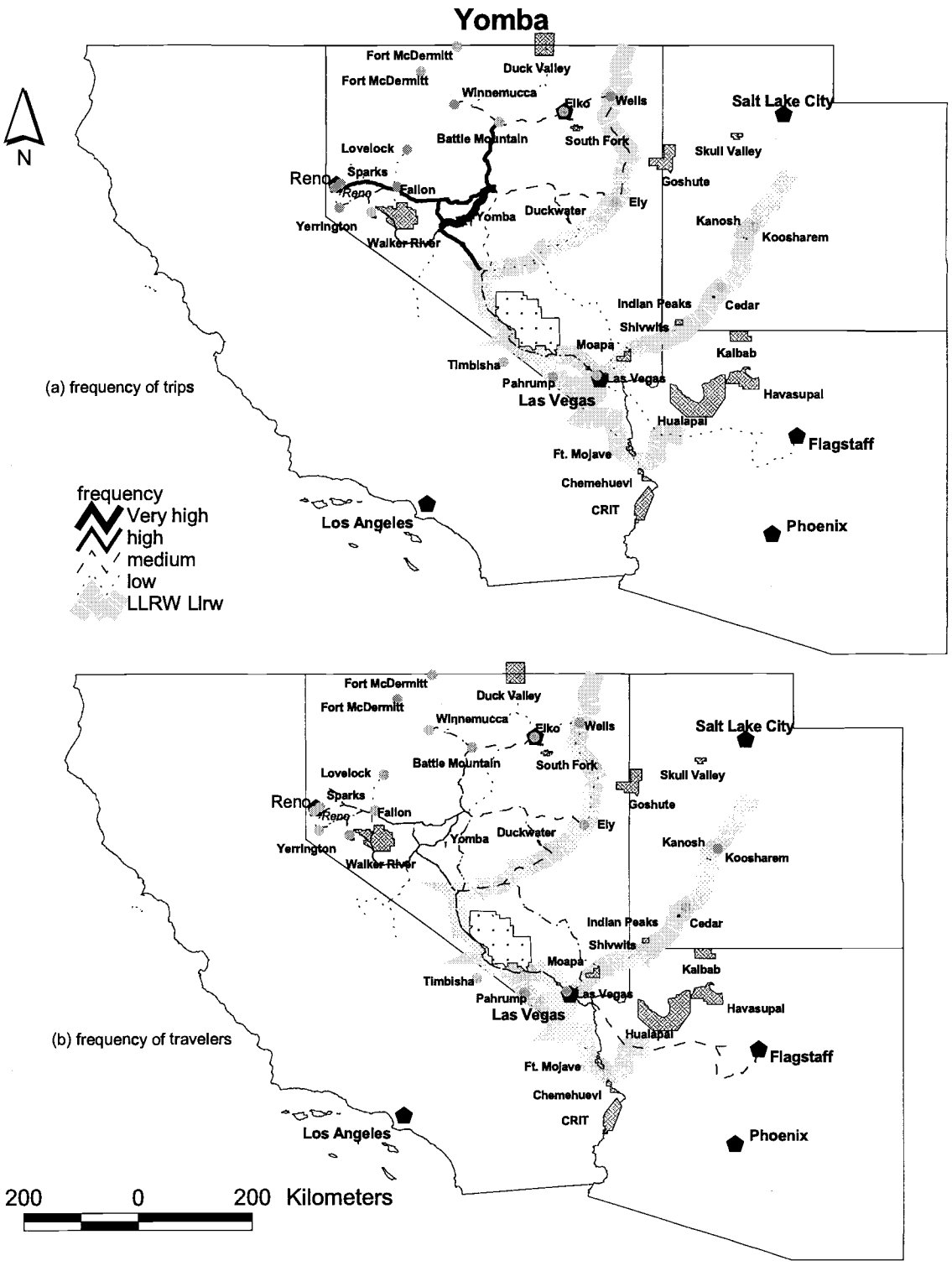


Figure 4.9 Frequency of Trips and Travelers for Yomba Individuals

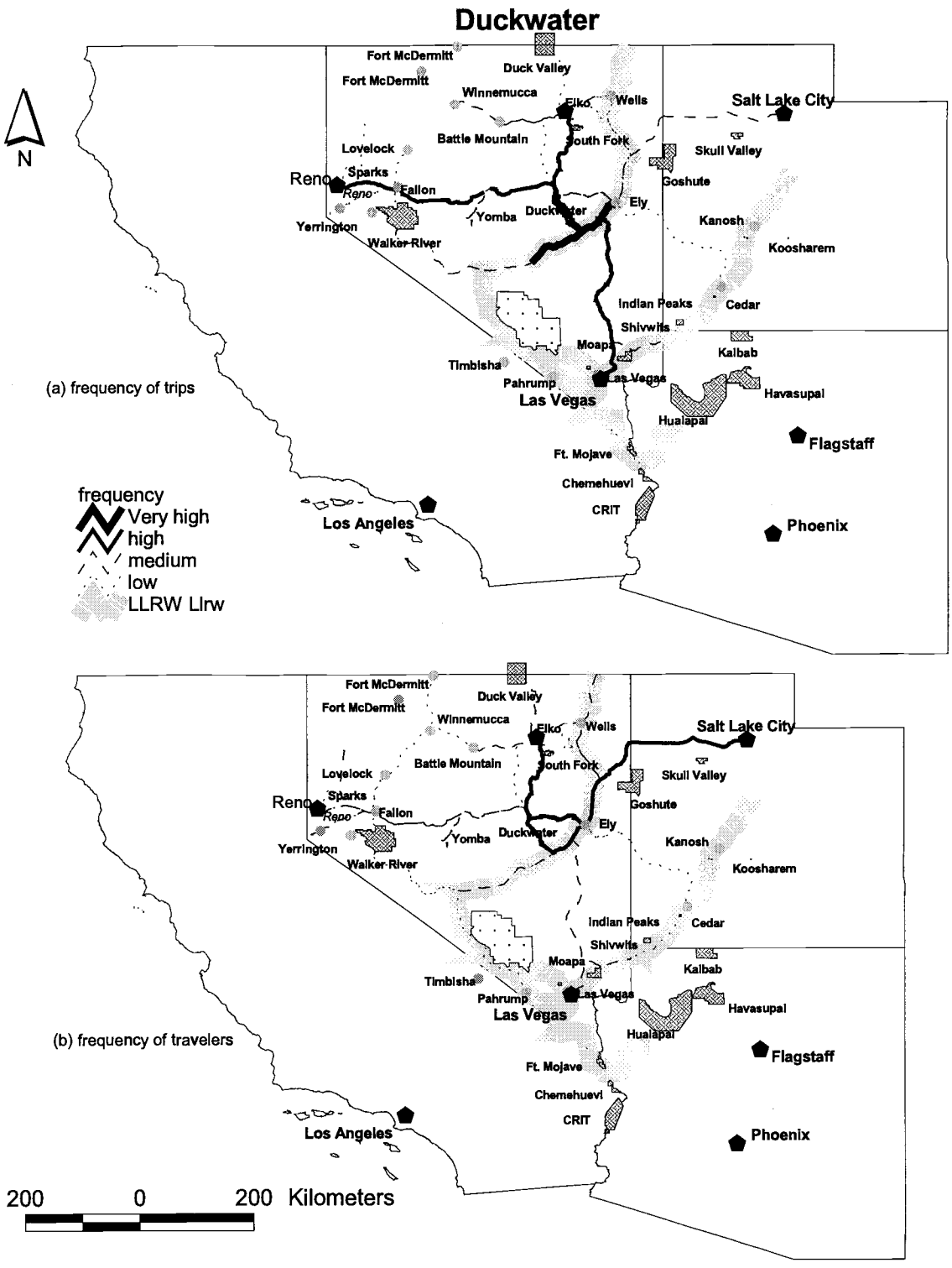


Figure 4.10 Frequency of Trips and Travelers for Duckwater Individuals

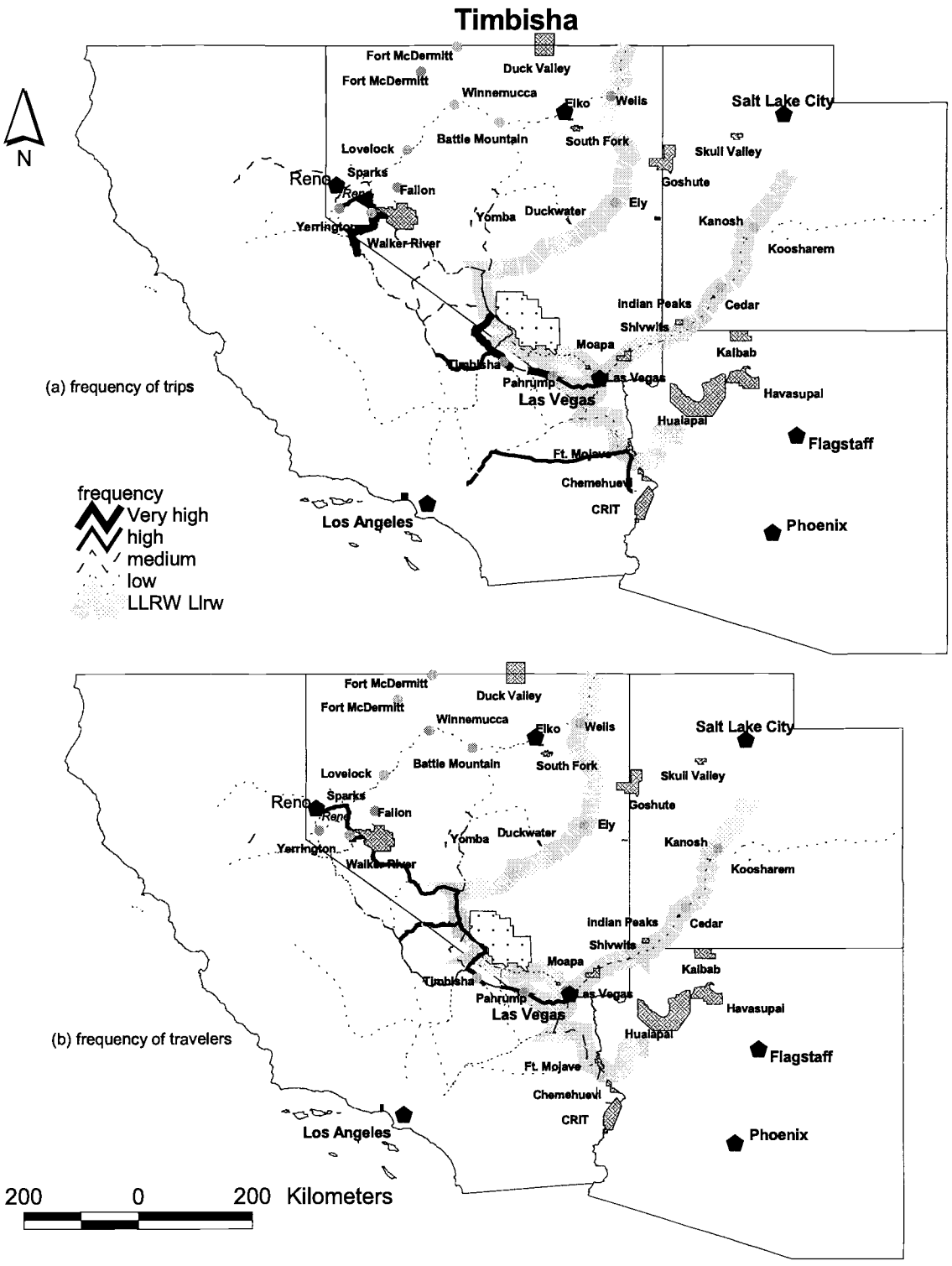


Figure 4.11 Frequency of Trips and Travelers for Timbisha Individuals

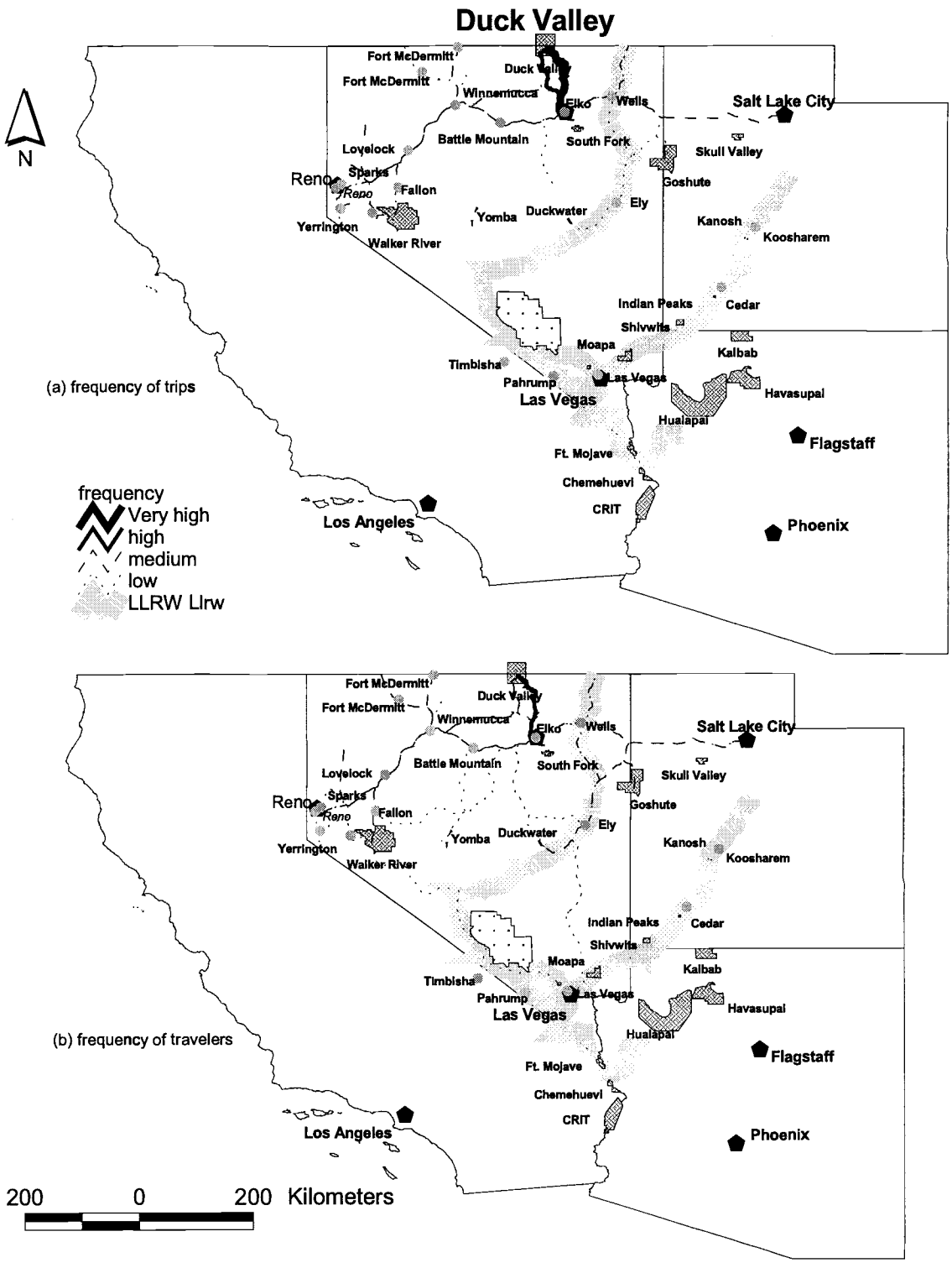


Figure 4.12 Frequency of Trips and Travelers for Duck Valley Individuals

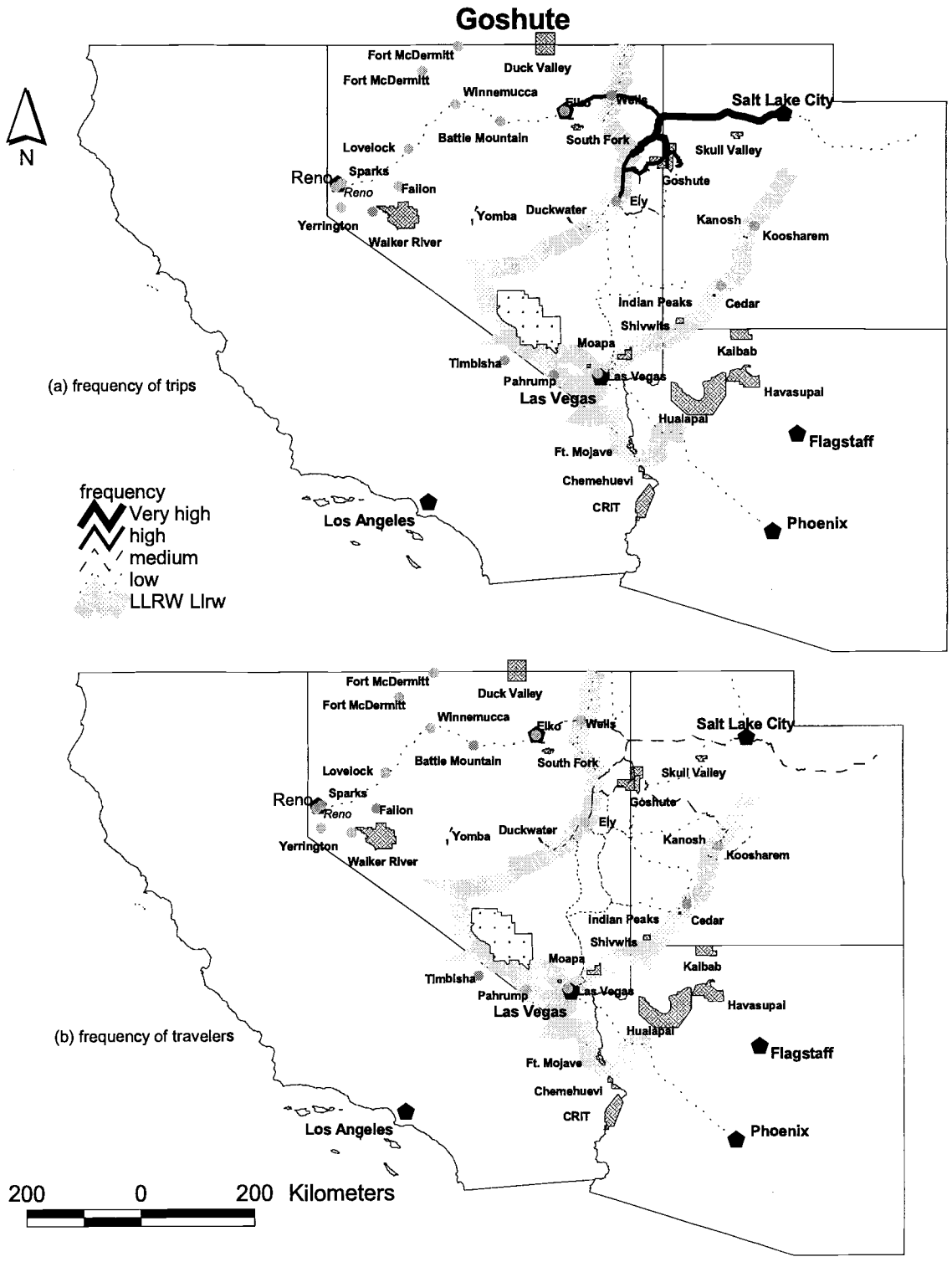


Figure 4.13 Frequency of Trips and Travelers for Goshute Individuals

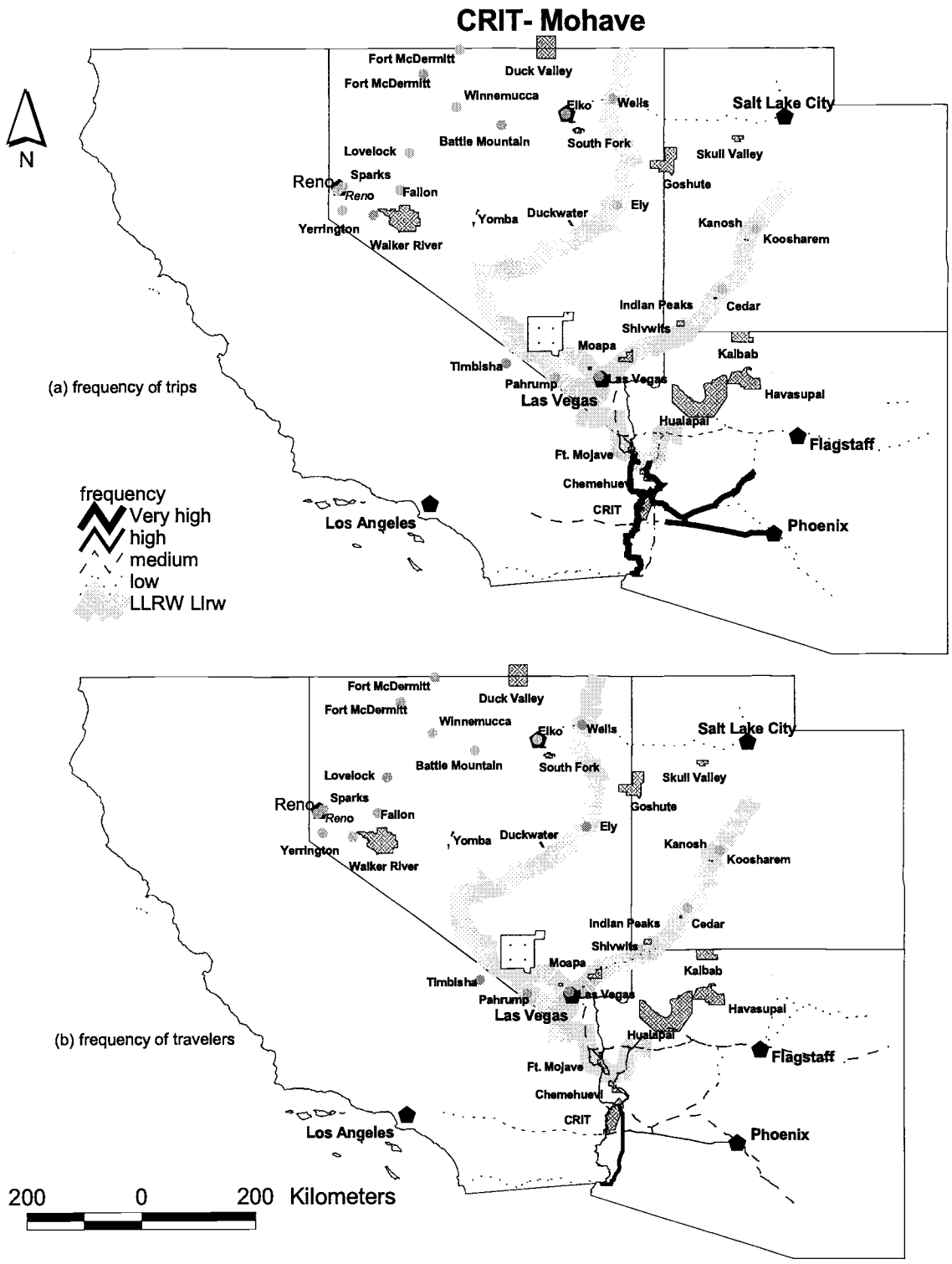


Figure 4.14 Frequency of Trips and Travelers for CRIT-Mohave Individuals

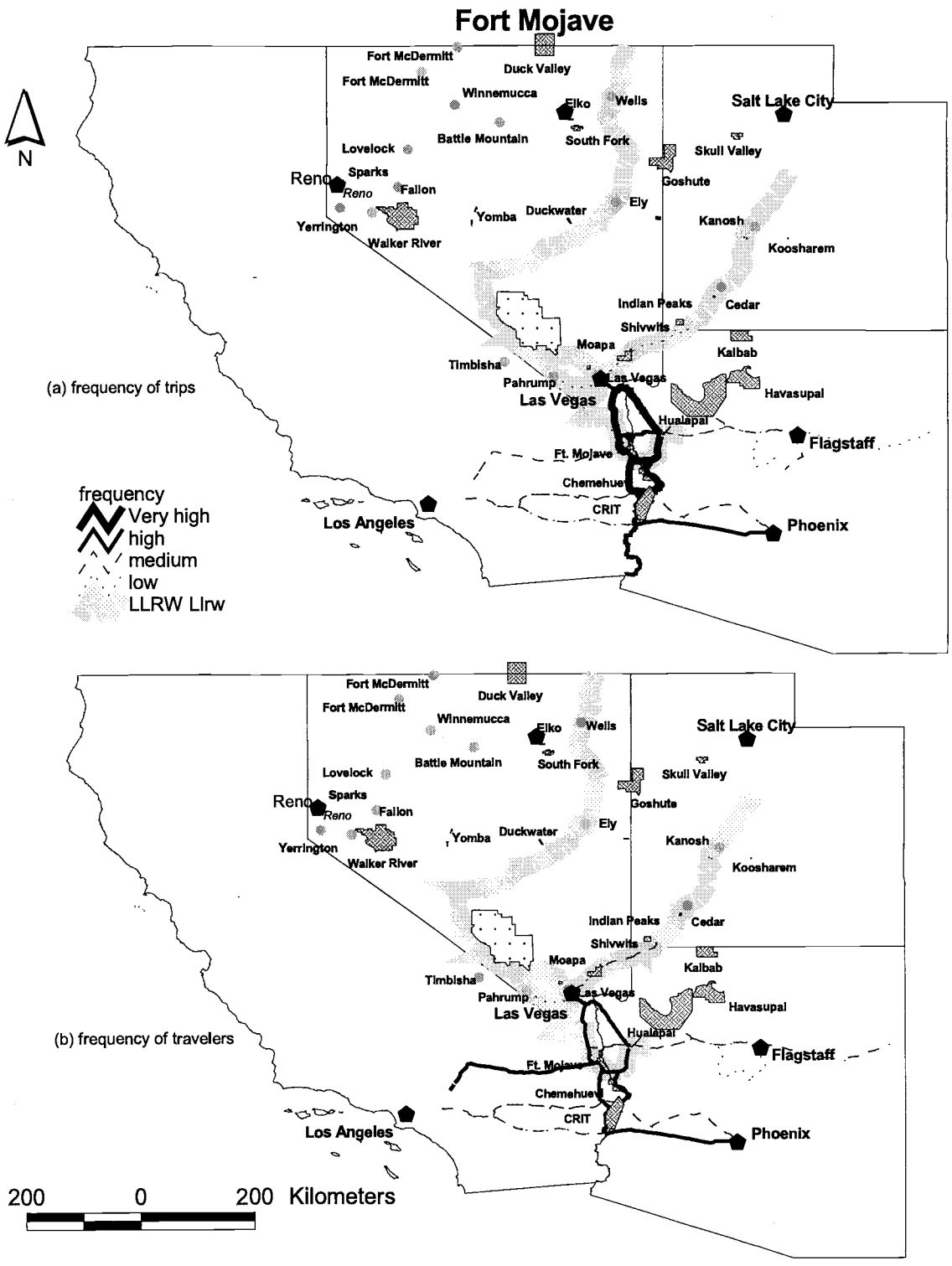


Figure 4.15 Frequency of Trips and Travelers for Fort Mojave Individuals

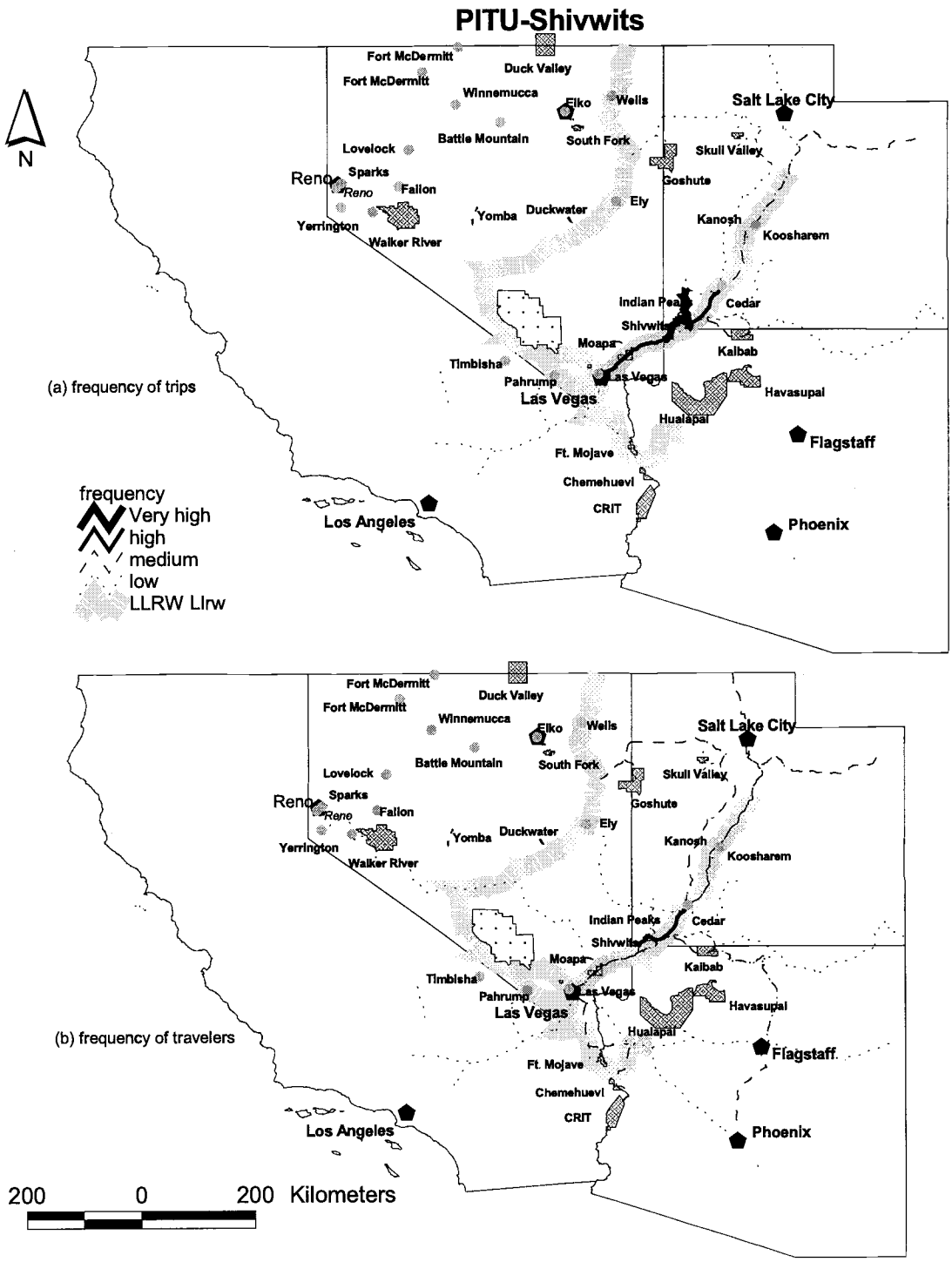


Figure 4.16 Frequency of Trips and Travelers for PITU-Shivwits Individuals

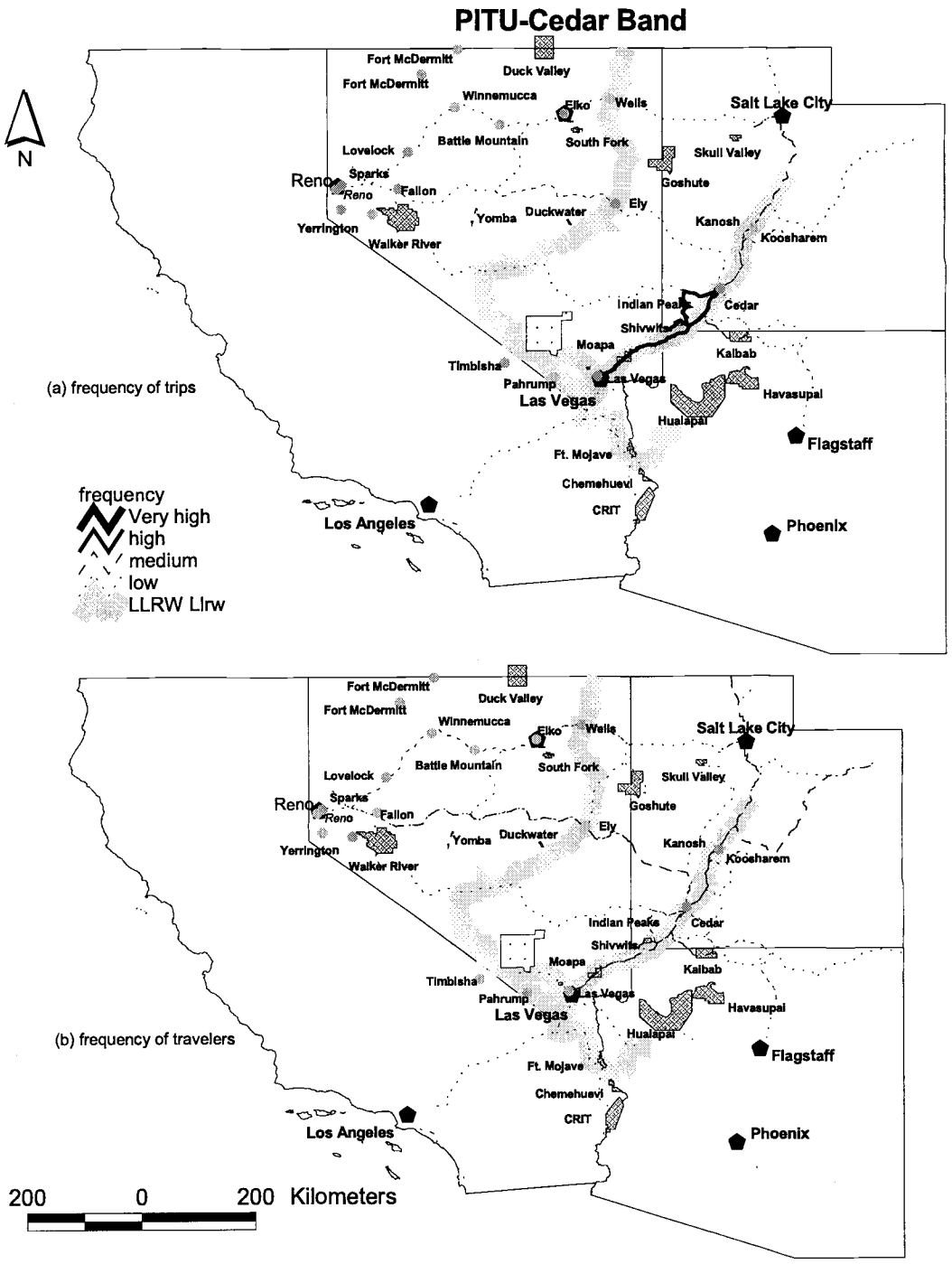


Figure 4.17 Frequency of Trips and Travelers for PITU-Cedar Band Individuals

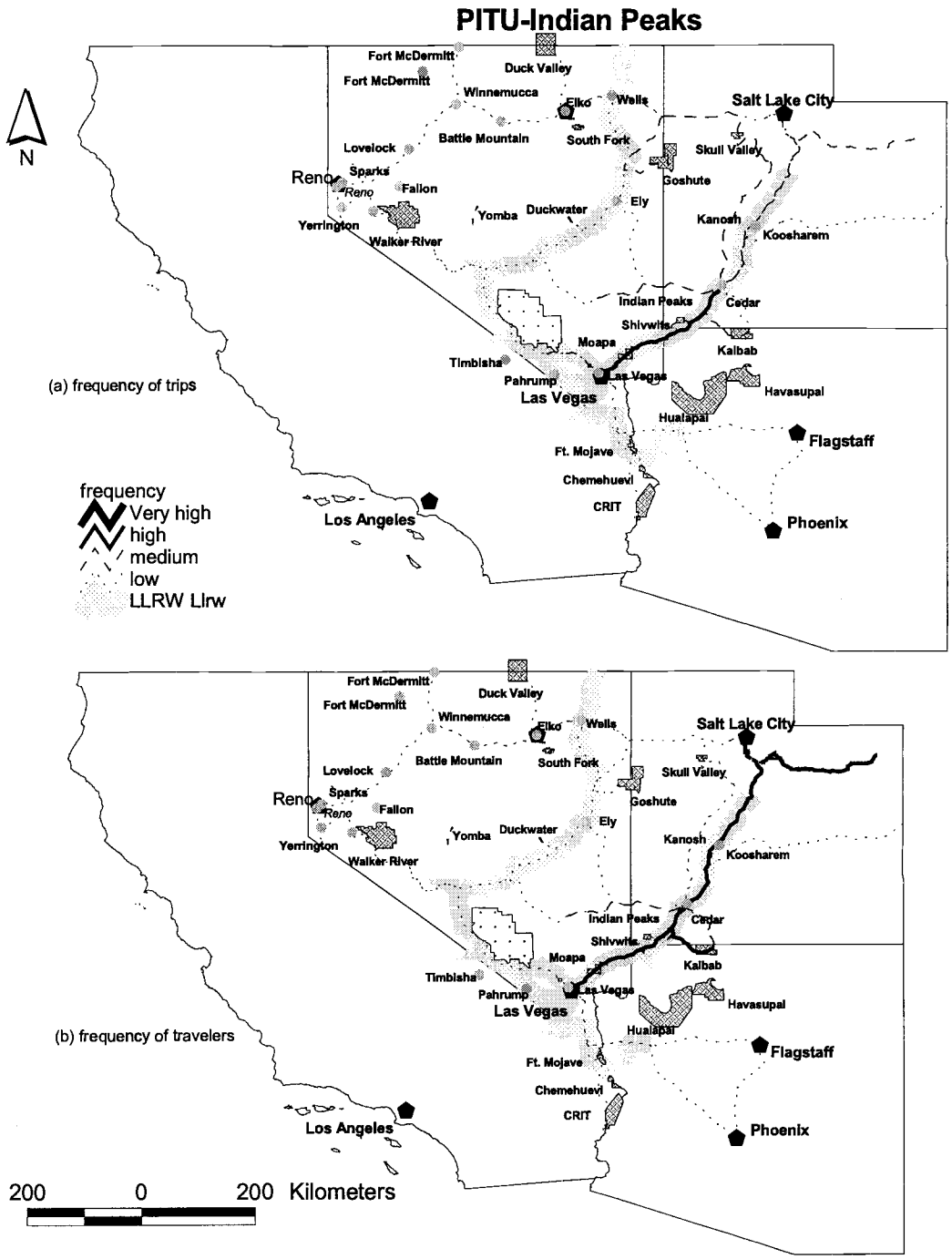


Figure 4.18 Frequency of Trips and Travelers for PITU-Indian Peaks Individuals

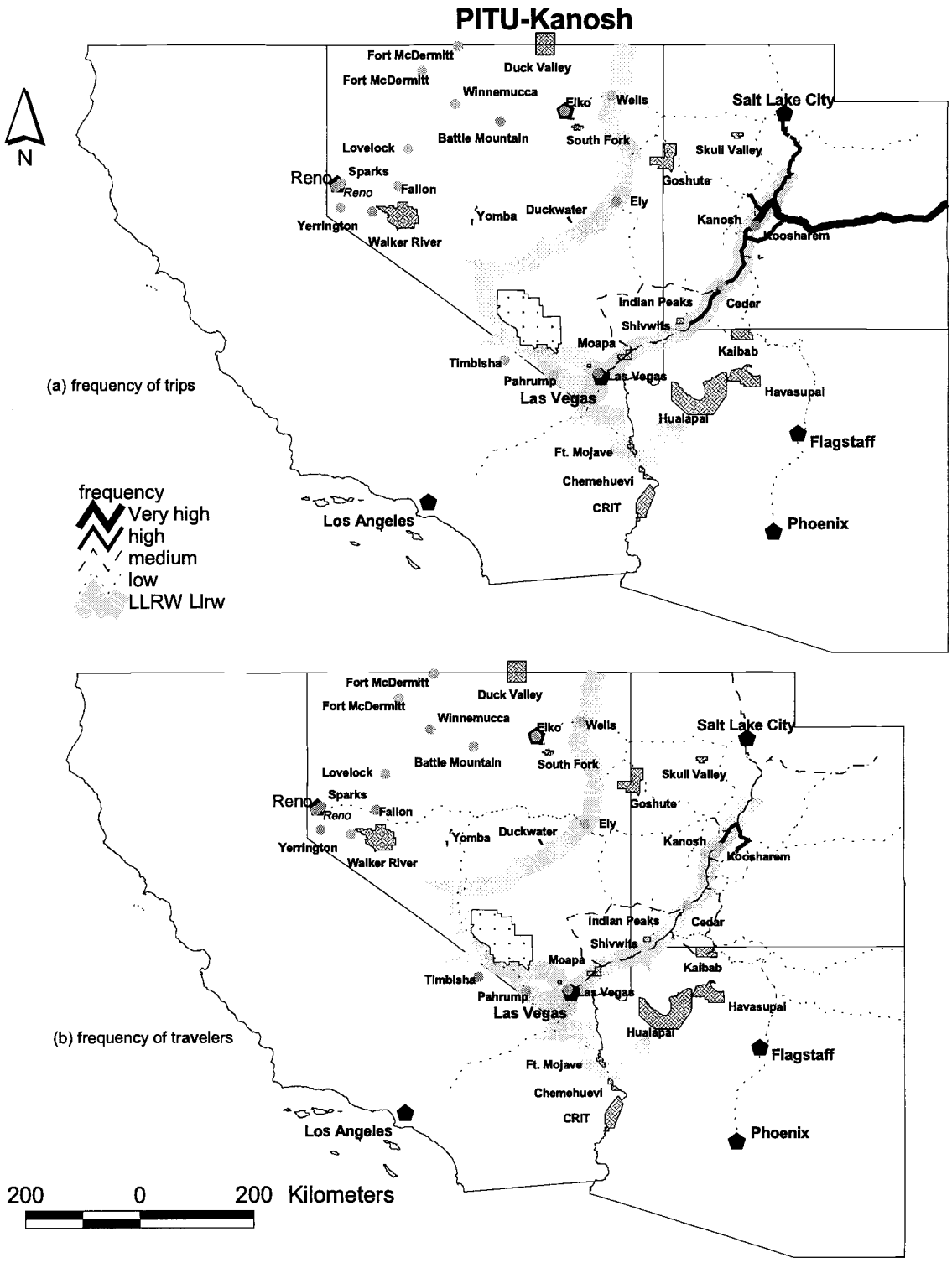


Figure 4.19 Frequency of Trips and Travelers for PITU-Kanosh

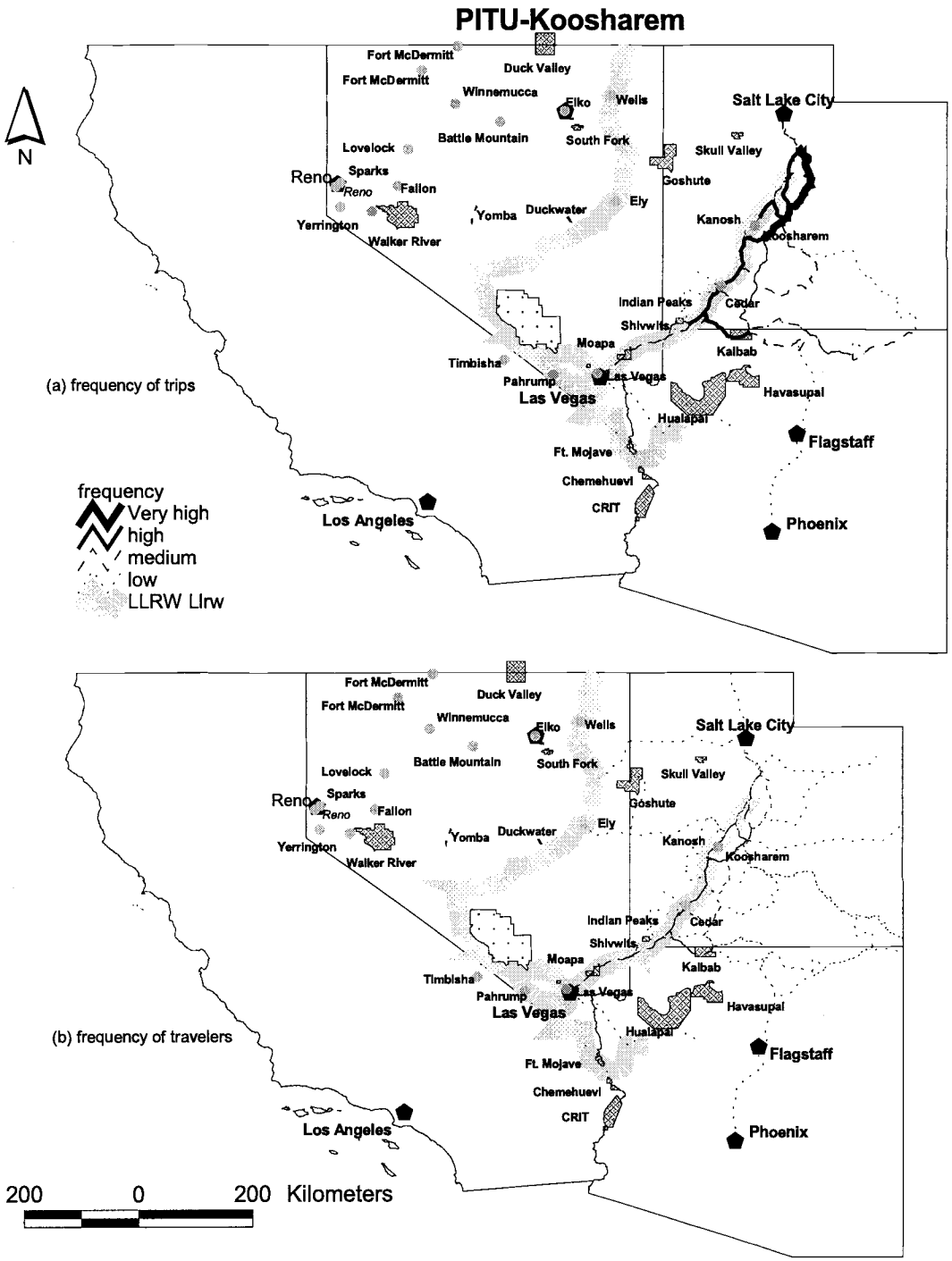


Figure 4.20 Frequency of Trips and Travelers for PITU-Koosharem Individuals

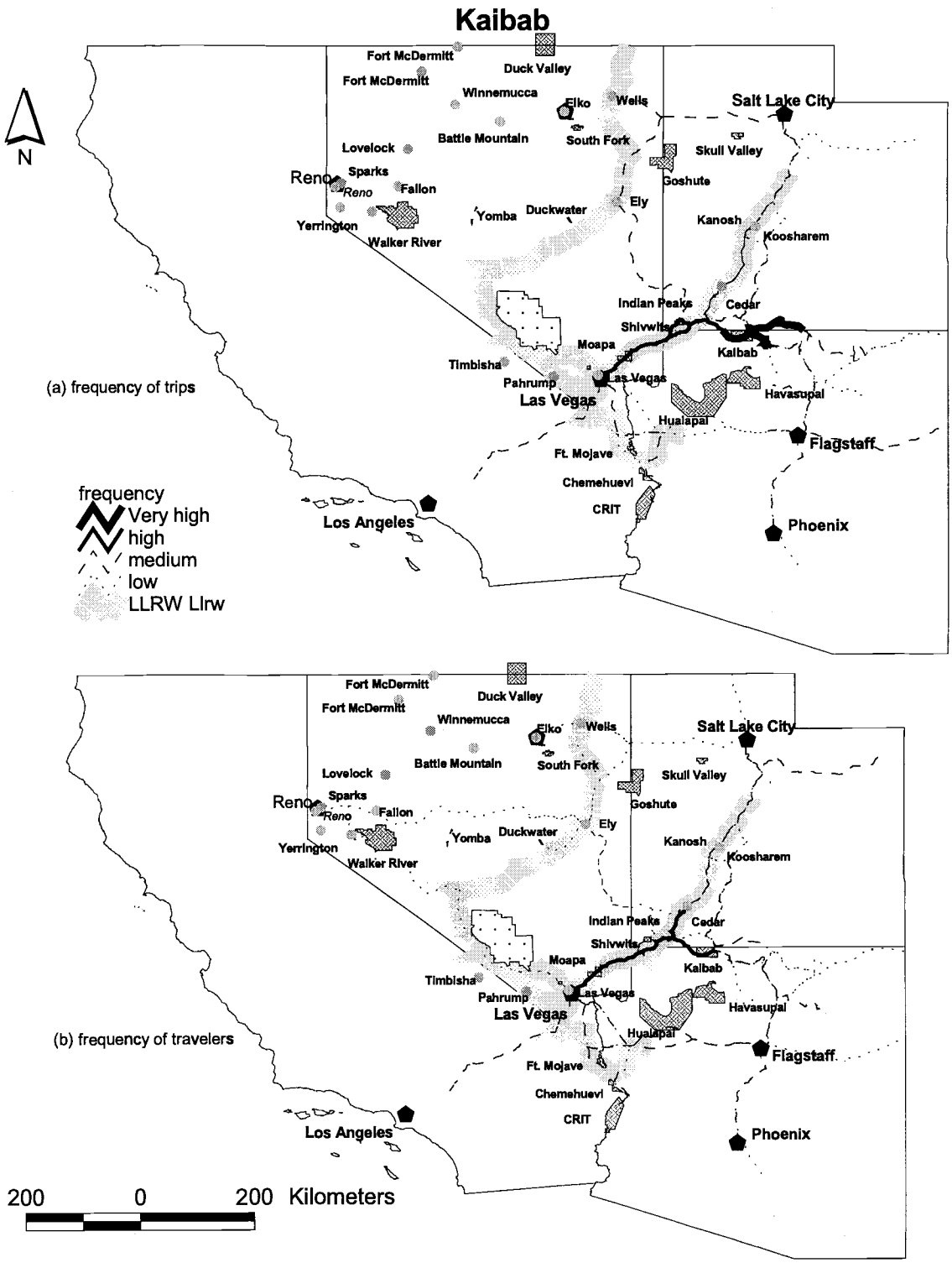


Figure 4.21 Frequency of Trips and Travelers for Kaibab Individuals

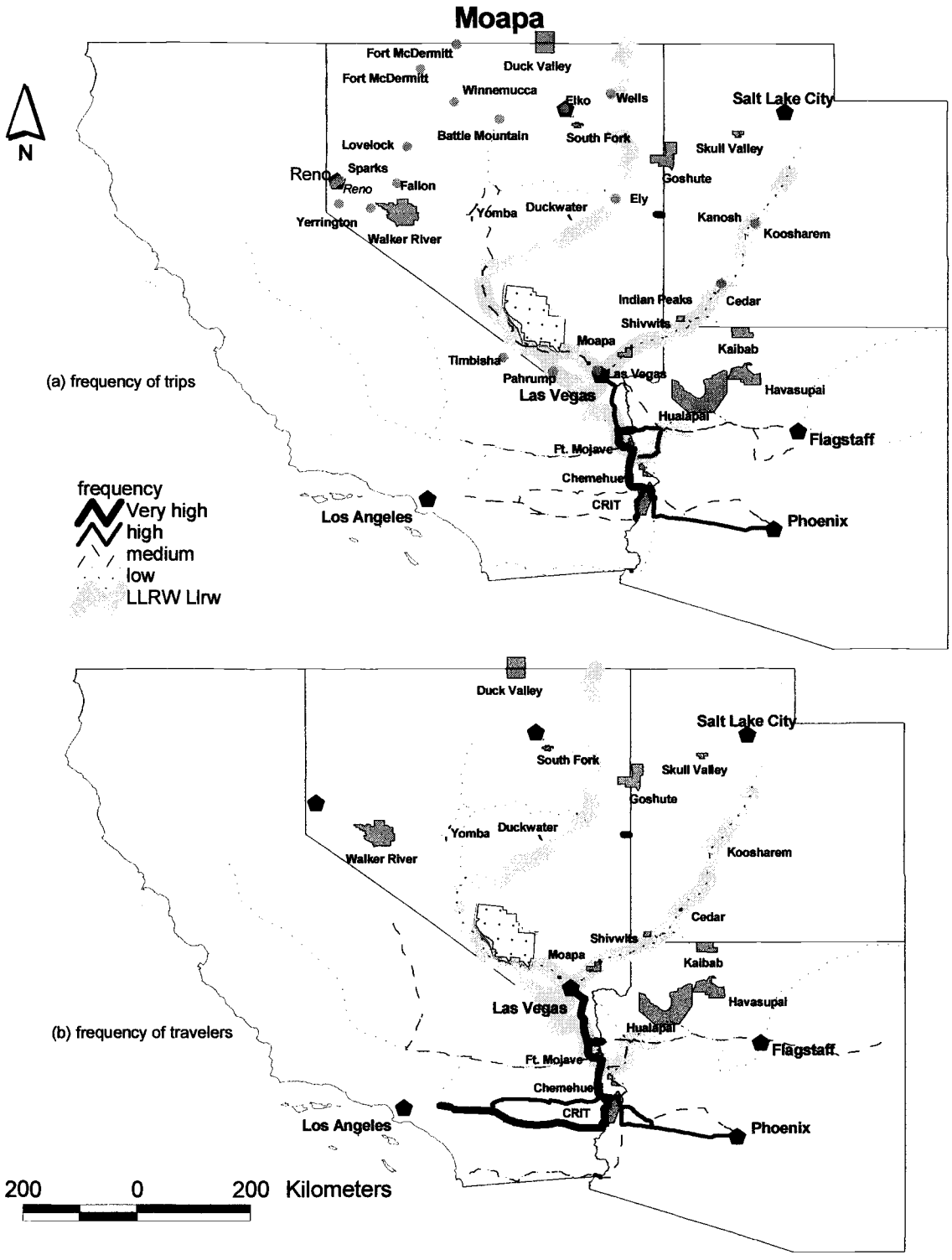


Figure 4.22 Frequency of Trips and Travelers for Moapa Individuals

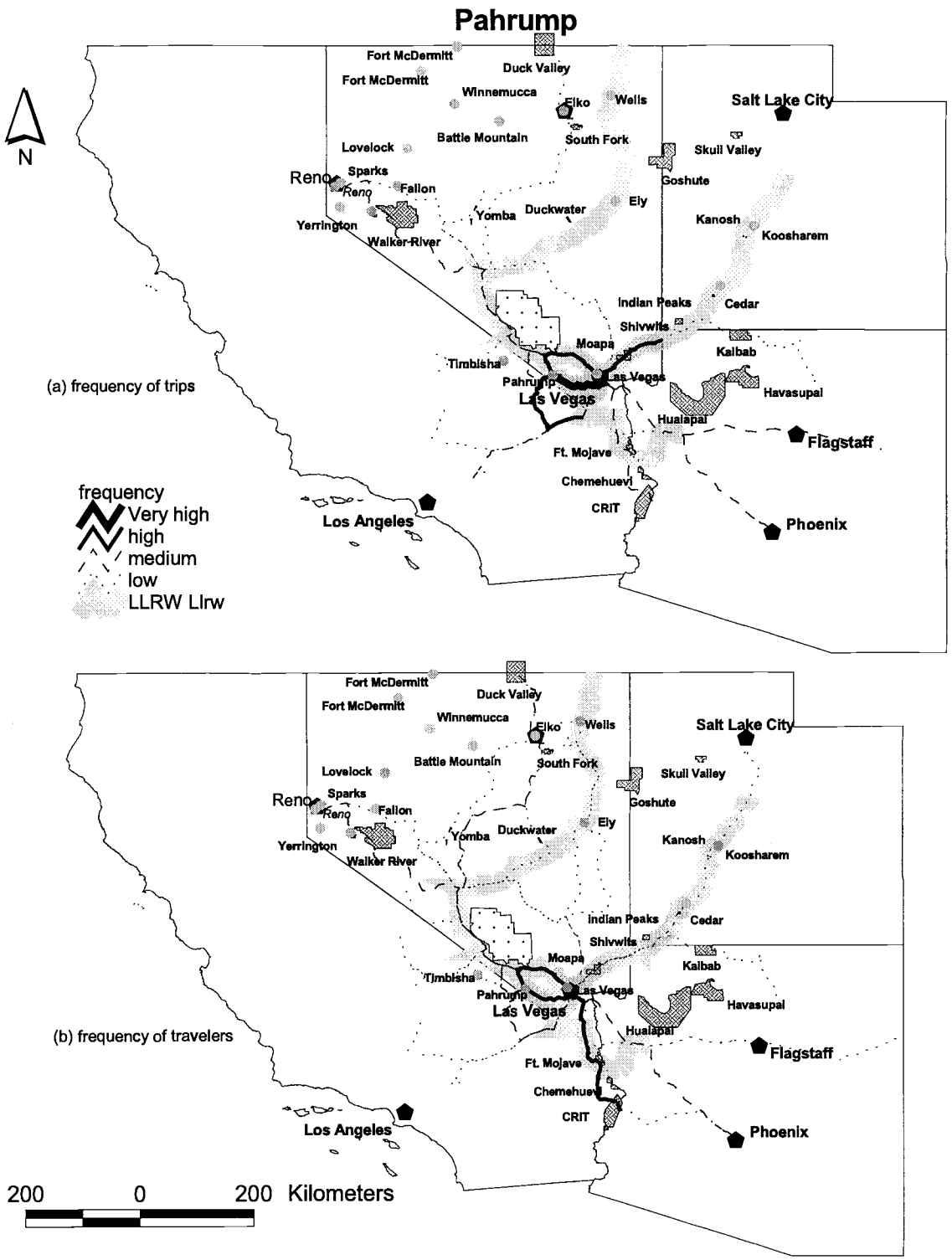


Figure 4.23 Frequency of Trips and Travelers for Pahrump Individuals

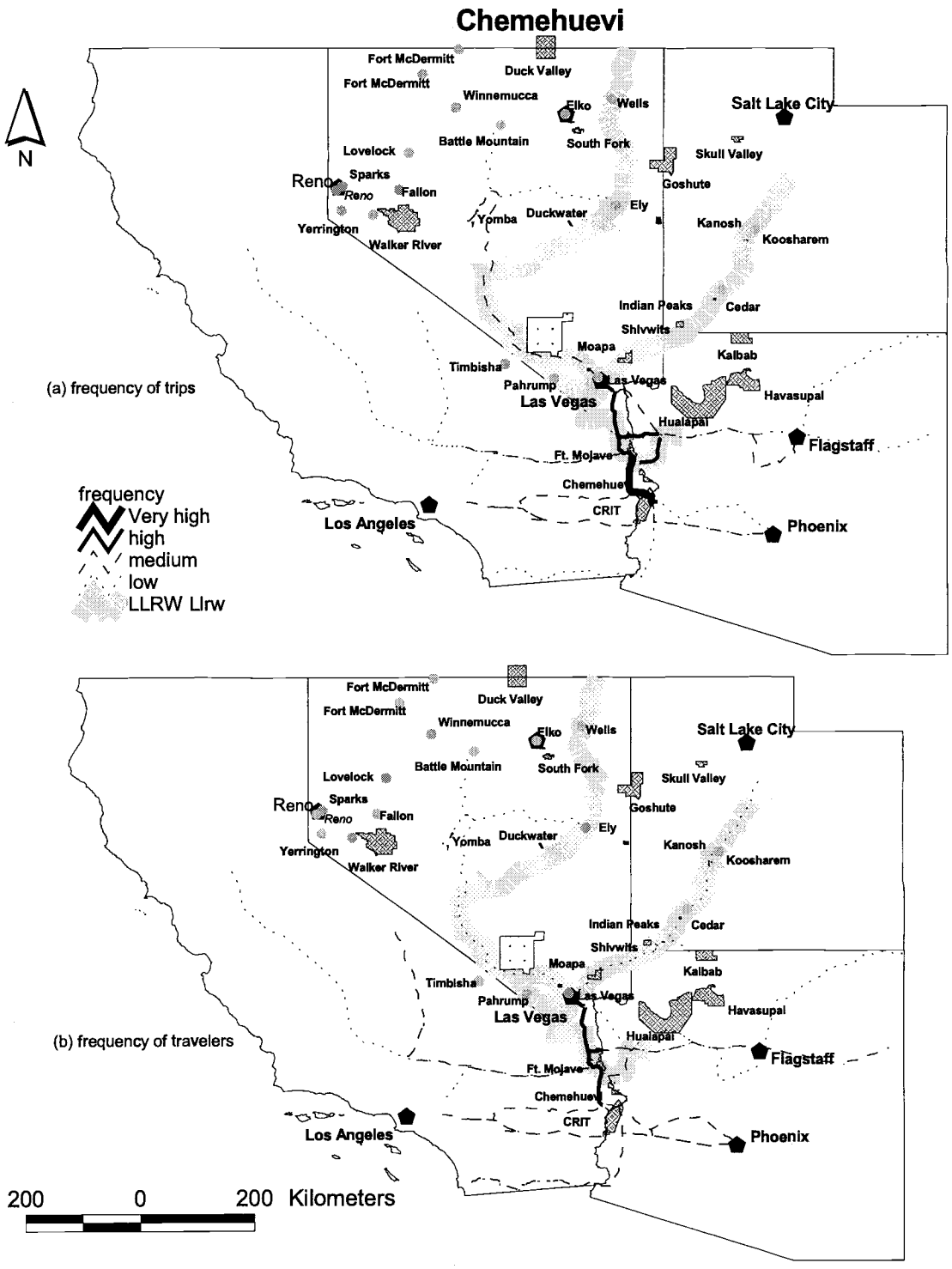


Figure 4.24 Frequency of Trips and Travelers for Chemehuevi Individuals

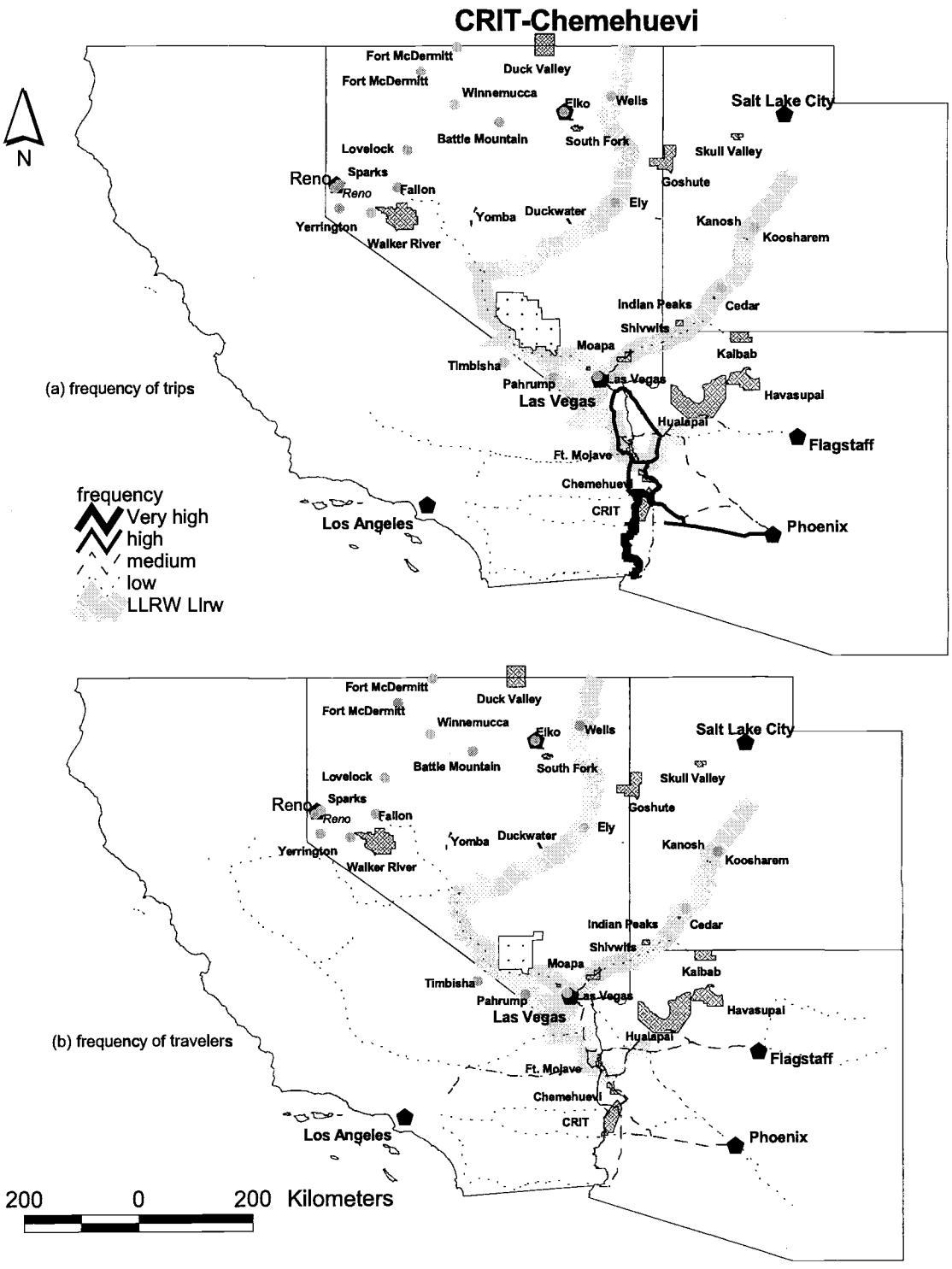


Figure 4.25 Frequency of Trips and Travelers for CRIT-Chemehuevi Individuals

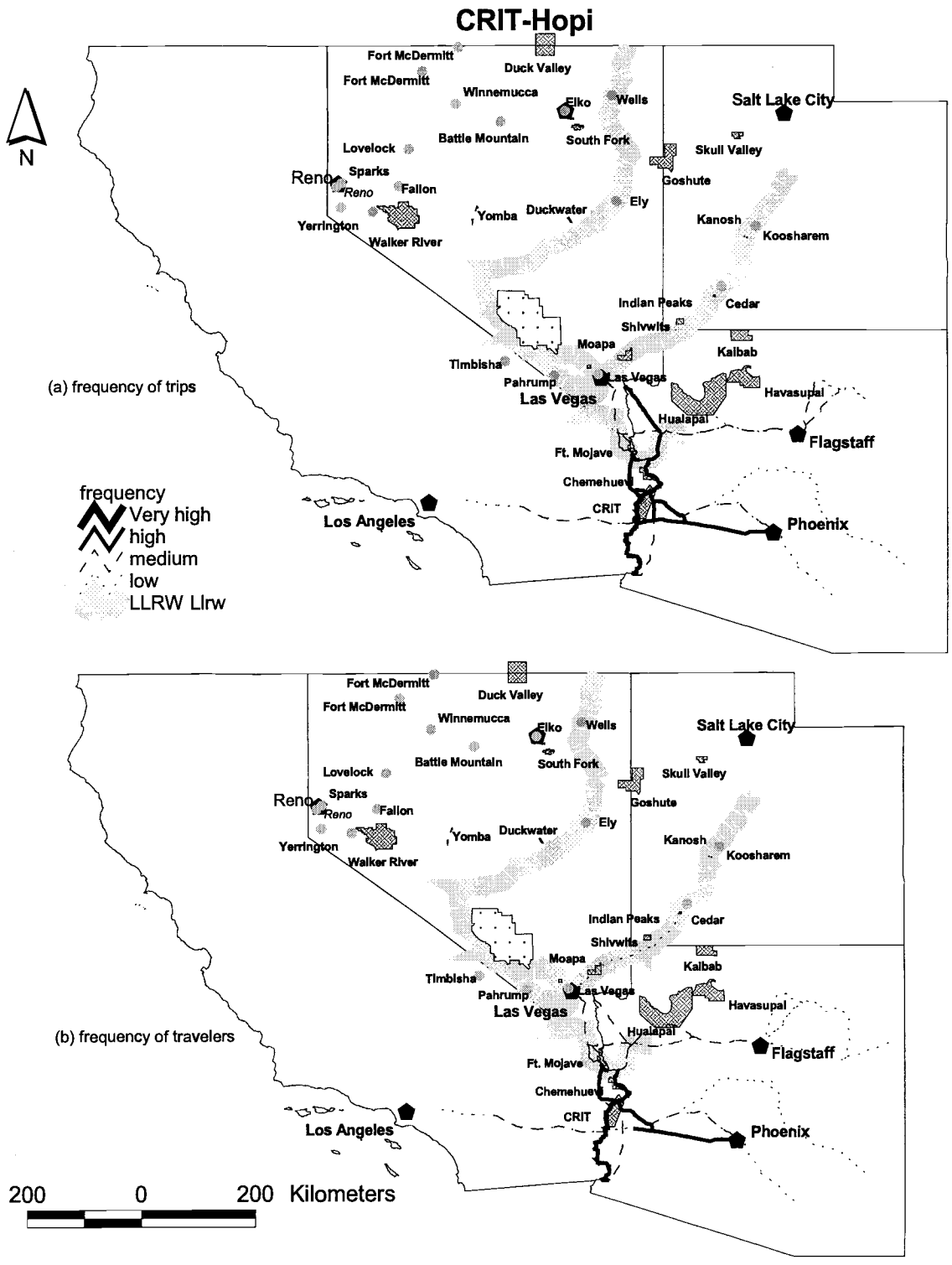


Figure 4.26 Frequency of Trips and Travelers for CRIT-Hopi Individuals

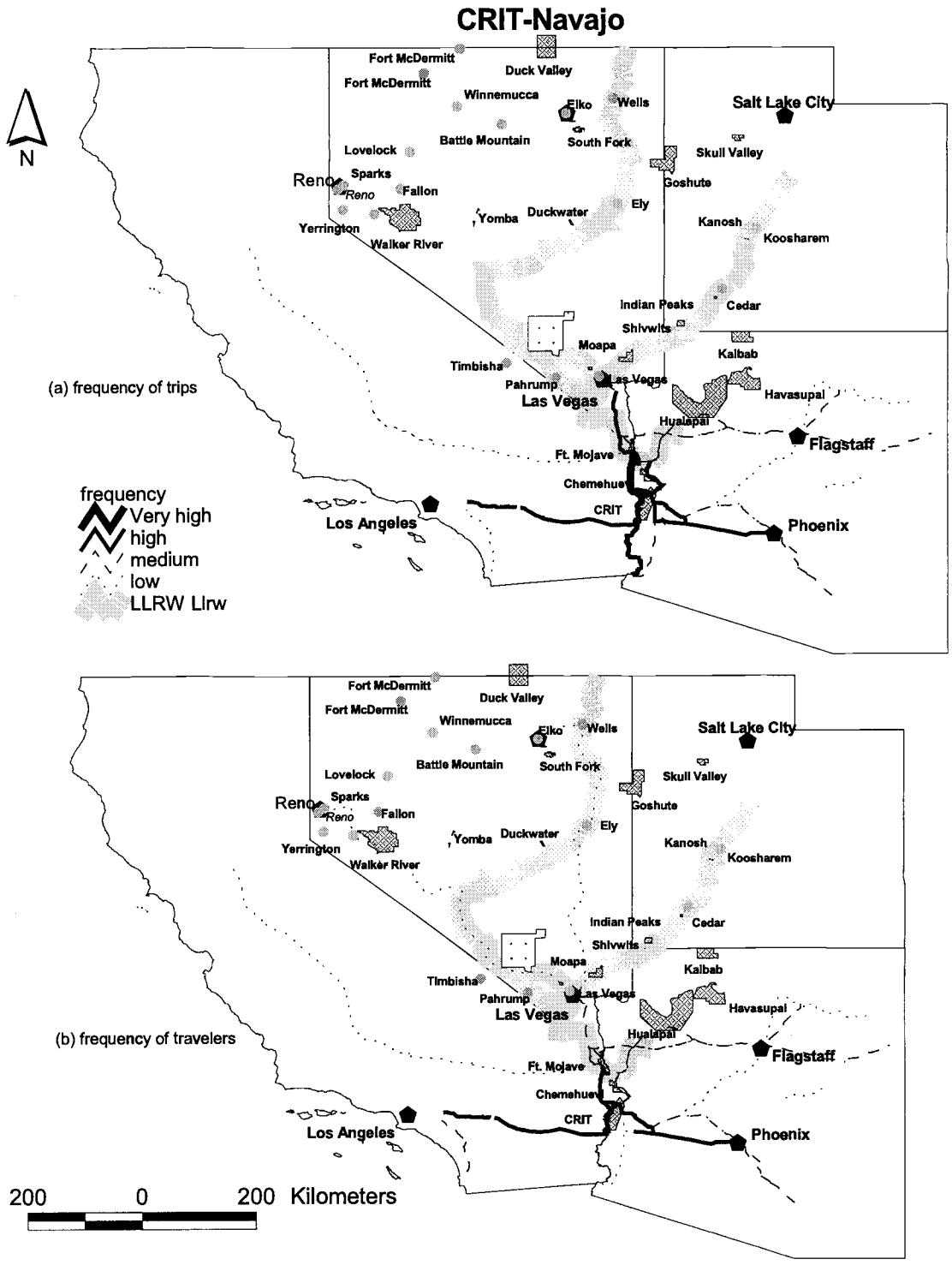


Figure 4.27 Frequency of Trips and Travelers for CRIT-Navajo Individuals

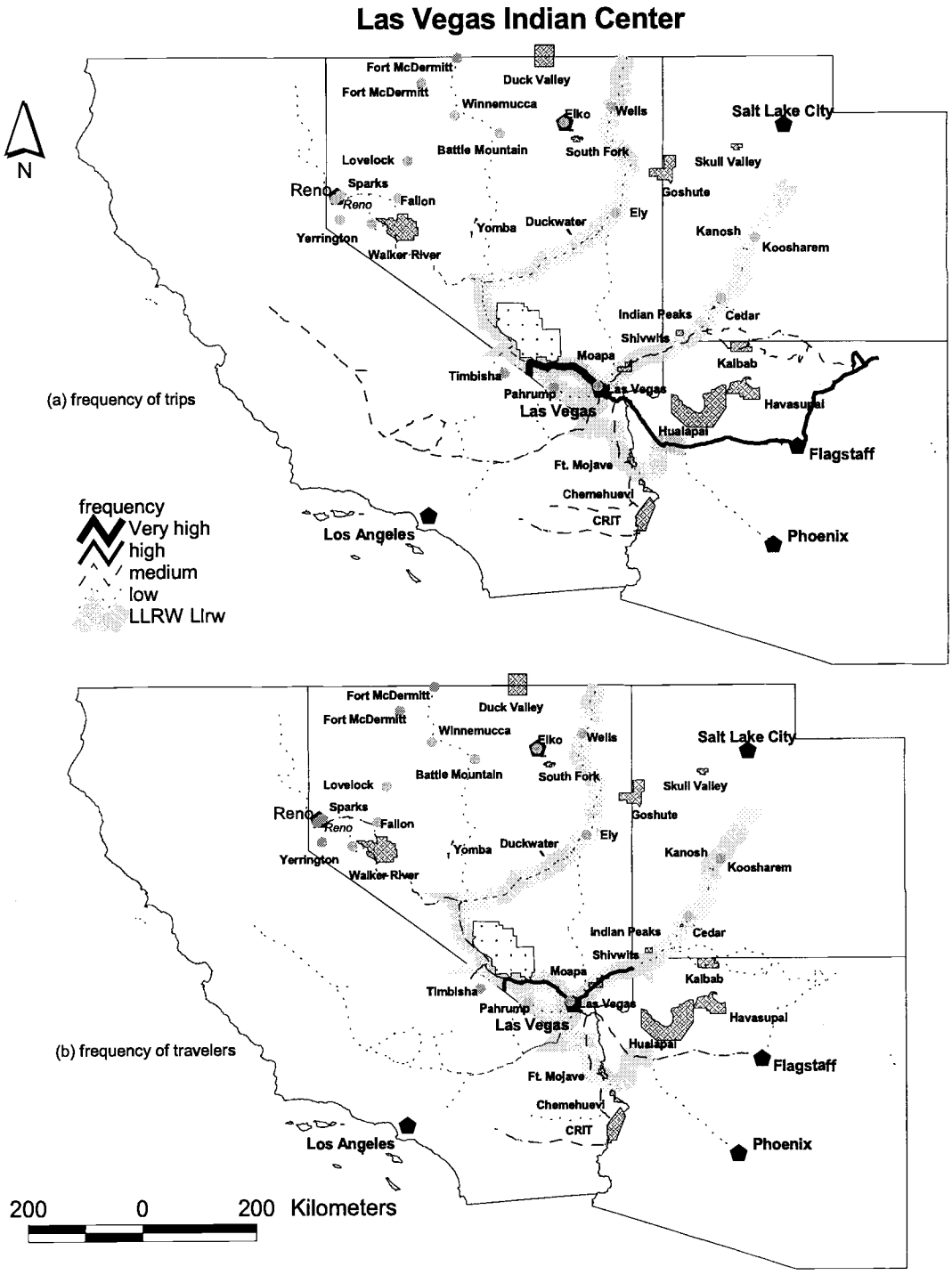


Figure 4.28 Frequency of Trips and Travelers for Las Vegas Indian Center Individuals

Tribal Travel Survey

While the travel patterns of individual tribal members form the foundation of this project's survey, the participating tribes and bands also maintain vehicles for official tribal use. Tribal vehicles comprise a significant portion of tribal travel. The Tribal Travel Survey gathered information from the participating tribes on the use of official tribal vehicles. Over 85 percent (16 out of 18) of the tribes and bands participated in this portion of the study, and the vehicles owned and maintained by these tribes and bands fall into five basic categories. Of the sixteen tribes that reported information about their vehicles, three have no tribally owned and operated vehicles. The five categories of vehicles of the remaining thirteen tribes and subgroups are shown in Figure 4.29 and described in the paragraphs that follow.

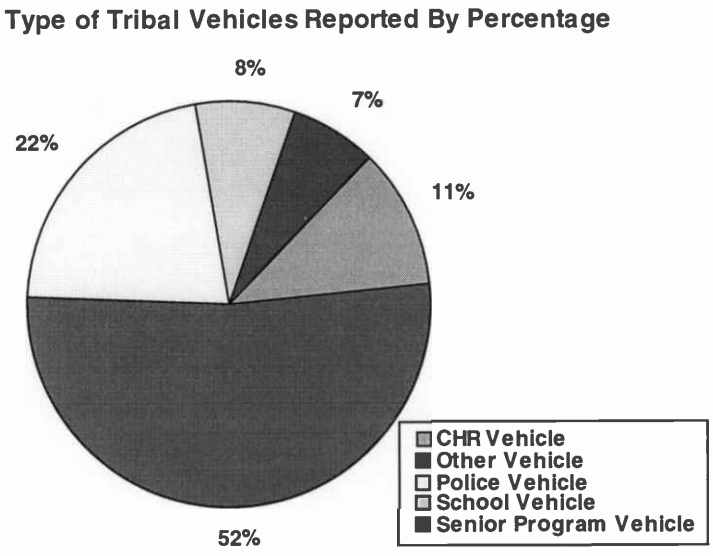


Figure 4.29 Percent of each type of tribal vehicle reported

1. **Community Health Representative (CHR) vehicles**: Most of the tribes interviewed for the tribal travel survey own and maintain a CHR van. The number of miles traveled by the CHR vehicles is highly variable. Those tribes and bands far away from towns and health facilities often accumulate a large number of miles in an average year. Of the tribes participating in this portion of the study, the Chemehuevi Reservation reported the largest annual mileage for CHR vehicles (60,000 miles per year). At the other end of the spectrum, the Ely Shoshone Tribe reported the smallest number of miles per year (14,000), which reflects their proximity to health care facilities. The CHR vans also carry multiple passengers, with a reported average of 3.2 passengers per trip.

2. **Police/Law Enforcement vehicles**: Tribes and bands often maintain one or more tribal police vehicles. The travel patterns of police vehicles are largely local, but patrol duties require the vehicles to spend large amounts of time on the road. Of the tribes and bands that

maintain a police vehicle, the average mileage of all vehicles per tribe/band surpassed 84,000 annually.

3. **School Transportation:** Several of the participating tribes and bands operate buses for transporting children to school. The number of passengers riding on such buses is, of course, large. In rural areas, the buses also travel long distances to and from school. In rural areas, these buses usually represent the only viable means for transporting children to school.

4. **Senior Program vehicles:** Most of the tribes participating in this portion of the study operate and maintain transportation vans for seniors. Typically, these are multi-passenger vans with reported average number of passengers per trip of 5.6. As with the other vehicles described, the mileage varies with the location of the tribe or band. Nonetheless, the average mileage reported was over 24,000 annual miles per tribe/band.

5. **Other vehicles:** Beyond those described above, the participating tribes and colonies own several other types of vehicles. Several of the tribes operate snow plows and heavy machinery. The Battle Mountain Colony owns and maintains a bus for a fire-fighting crew. During particularly hot or dry summers, this bus carries a large crew to various points in the surrounding states. The Kaibab Band of Paiute Indians reported the use of a housing vehicle, as well as a substance abuse health vehicle. Finally, some tribes operate general purpose vans for administrative use.

The ethnic groups represented in this study are scattered over several states, and the tribal reservations are often located in remote portions of the landscape. As revealed during these interviews, the administration of these tribes and bands requires frequent travel over large distances. The various vehicles described above are a significant part of the administrative infrastructure of the participating tribes. While many individuals interviewed in the course of this project expressed concerns over the transportation of LLRW on local highways, administrators of the tribes and bands note that the transportation could also affect their ability to manage and coordinate their resources and membership.

Analyzing Use

The maps and charts shown in the preceding sections confirm that the proposed transportation routes are used by members of the tribes participating in the study. Visual inspection of those maps is sufficient for identifying heavily traveled corridors for each tribe and ethnic group. For example, the section of I-15 through southeastern Utah is central to Southern Paiute travel while Mohaves frequently use U.S. 95 in southern Nevada and California.

A route-by-route examination of the trips taken by tribal members indicates that much of the travel occurs between tribes. The comments of study participants during the interviews indicate that such travel is a very important part of their lives. The significance of tribal travel is directly related to the unique history of the Great Basin tribes and their resistance to relocation onto reservations which led to the present patterns of settlement (see Chapter Three). First, the tribes in this area were traditionally organized into subunits and occupied large territories.

Regular interaction among these subunits was necessary for activities such as trade and marriage and involved travel. Second, despite numerous efforts by the U.S. federal government to merge the tribes onto reservations, with few exceptions the tribes in the Great Basin refused to leave their homelands. Today, although the tribes occupy only small portions of their traditional lands, they remain within their aboriginal territories. The lives of Native Americans in this area are unquestionably different from the lives of their ancestors. Nevertheless, certain traditions, such as hunting, pine nut gathering, and conducting funerals, continue to be practiced. Given the loss of many traditional practices, the surviving ones have become especially important for cultural continuity. These practices are linked to travel along highways. Therefore, *travel along highways is an important factor in the cultural continuity of all tribes participating in this study. This includes travel along routes that have been proposed for the transportation of low level radioactive waste to the Nevada Test Site.*

Hunting and Gathering

At least some members of all participating tribes still participate in traditional hunting and gathering activities. Each study participant was asked to indicate on a map the areas that s/he or members of the immediate family presently use for hunting and/or gathering. Study participants were not asked to give specific locations, such as spring sites or caves, nor were they asked to differentiate among gathering plants, gathering minerals, and hunting.

The combined areas for all members of a single ethnic group provide a means for establishing the basis for potential impact to tribal members from the transportation of LLRW. To explore the use of the area, the maps of all tribes within an ethnic group were combined to create a single ethnic group map (see Figures 4.30-4.33). The hunting and gathering areas for each ethnic group are viewed with respect to the aboriginal territories of these ethnic groups as defined during the NTS-EIS (American Indian Writers Subgroup 1996). It is important to note that these maps do not represent all areas currently used by members of that ethnic group for hunting and/or gathering. Instead, the purpose of the maps is to demonstrate that members of the participating tribes use the land and resources beyond the boundaries of their reservations, including areas immediately adjacent to the proposed LLRW transportation routes.

Analyzing Data About Hunting and Gathering

The maps shown in the preceding section confirm that the proposed transportation routes lie within areas still used for hunting and gathering by members of the tribes participating in the study. Through visual inspection, one can see that the areas are not arbitrary. As shown in Figures 4.30-4.33, use of the land and resources remains closely tied to traditional territories. For example, Western Shoshone participants almost exclusively utilize lands and resources

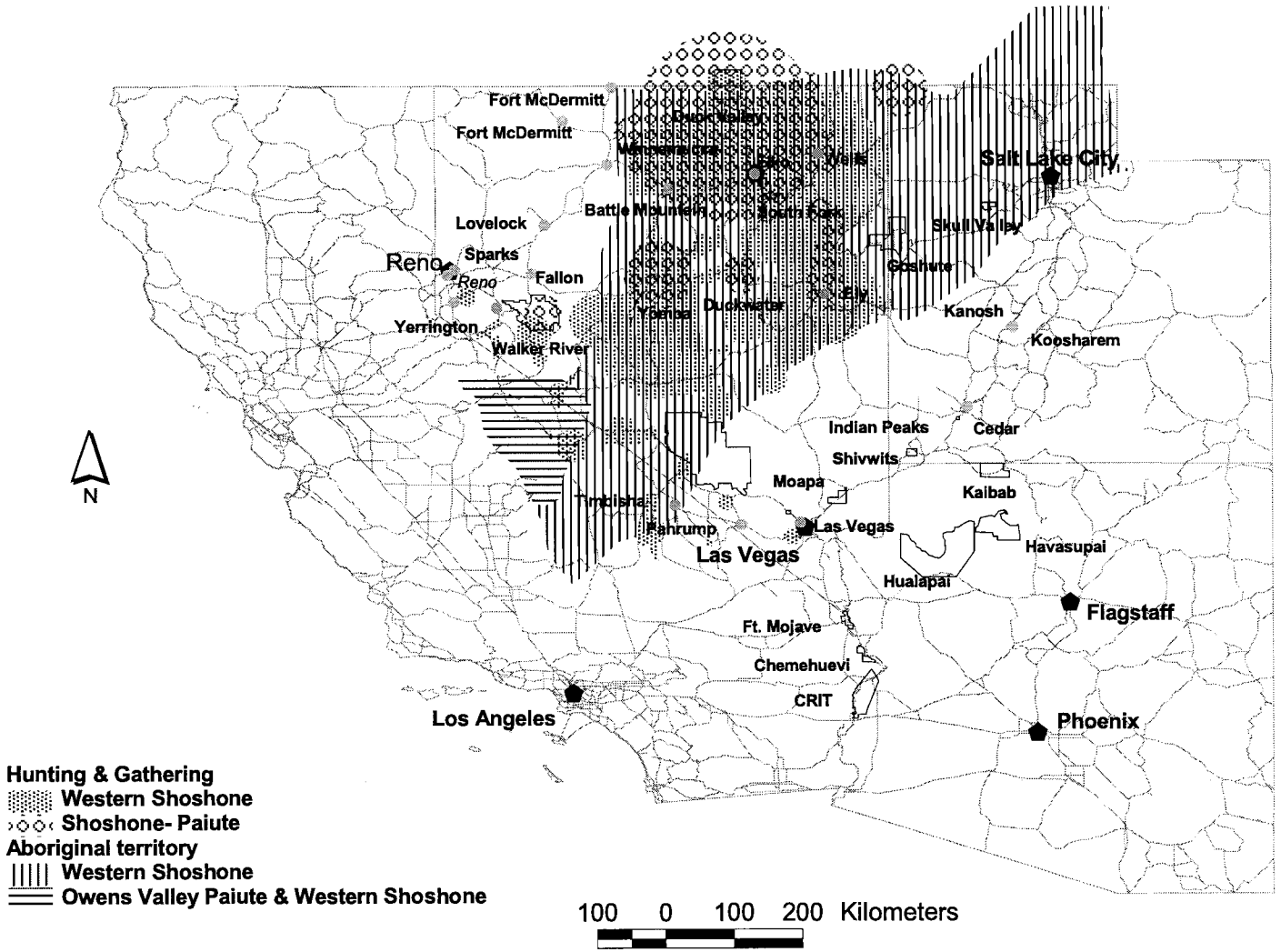


Figure 4.30 Evidence of Contemporary Western Shoshone Use of Lands and Resources

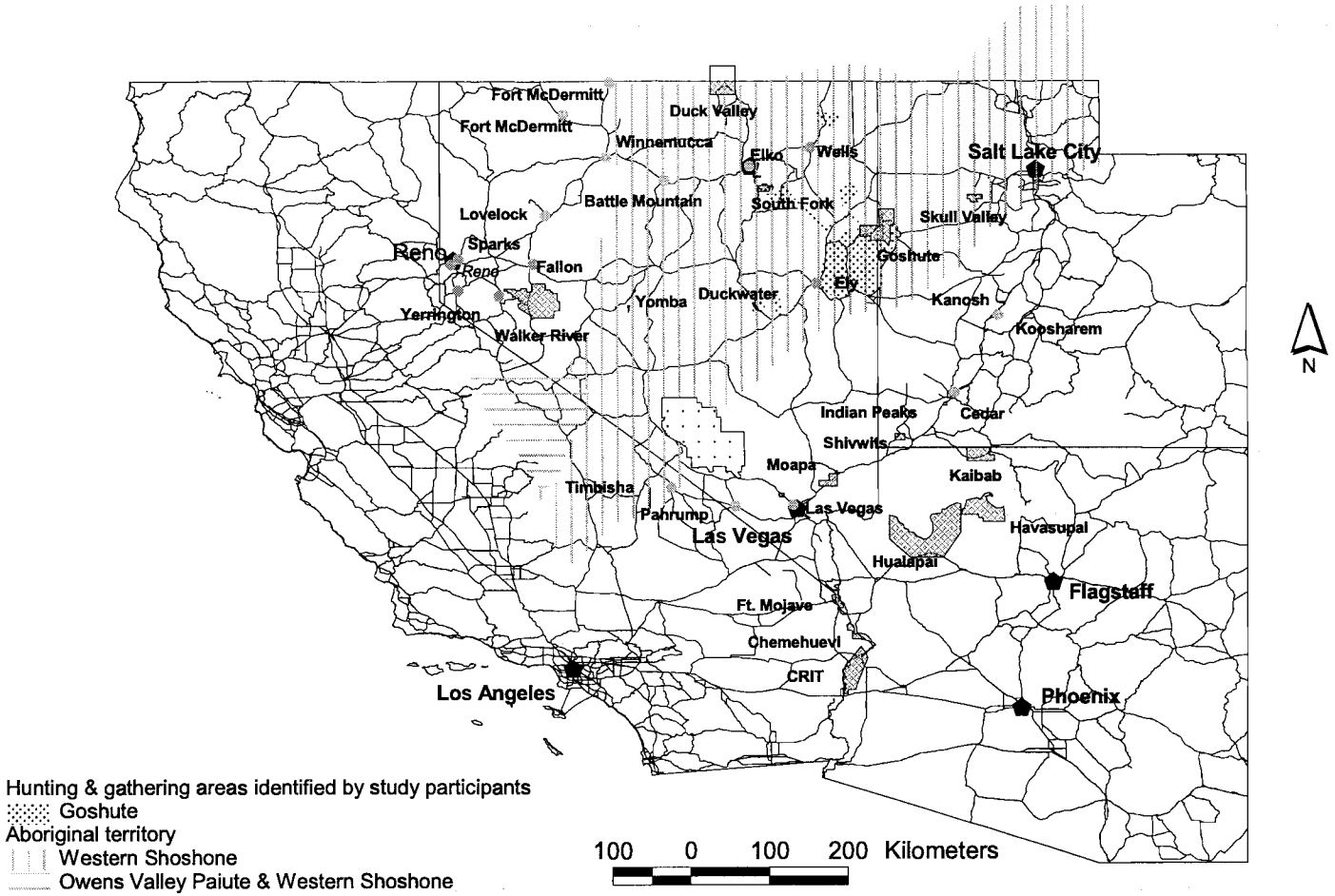


Figure 4.31 Evidence of Contemporary Goshute Use of Lands and Resources

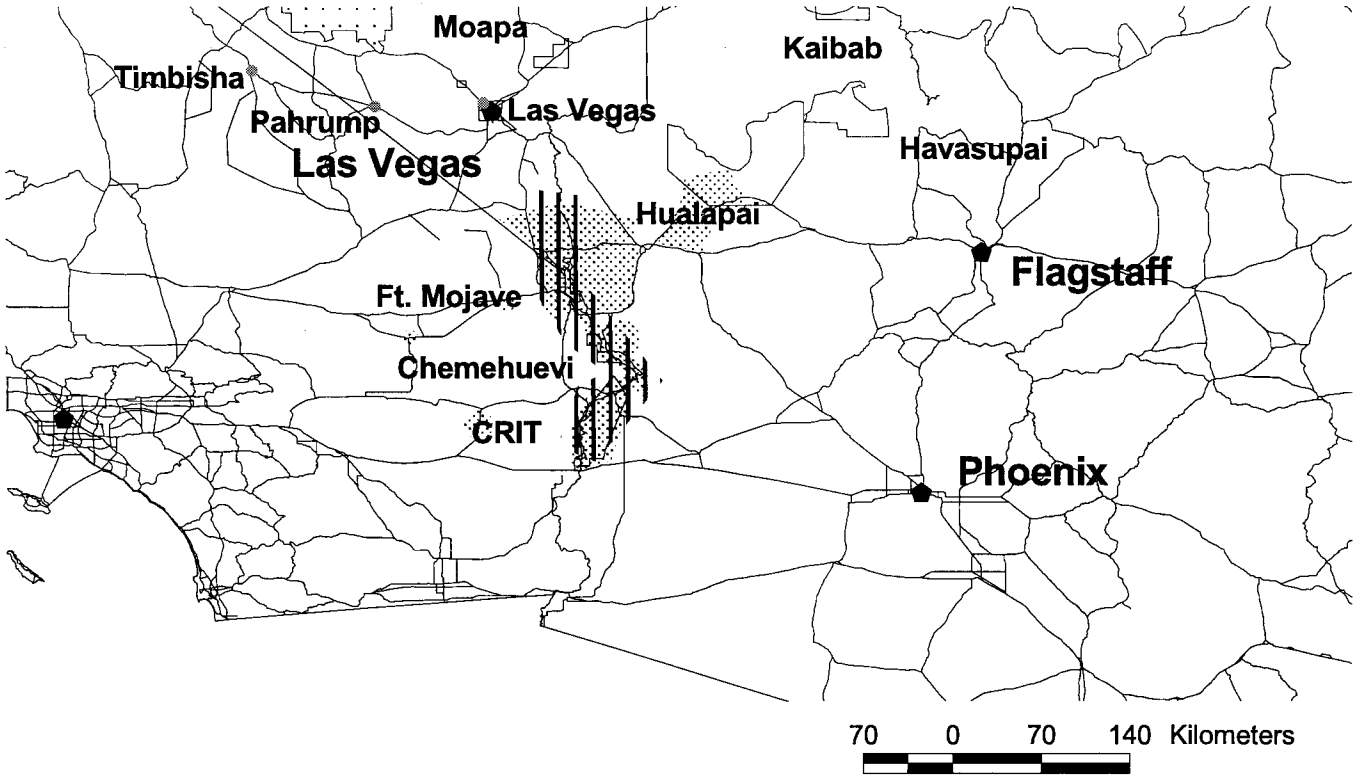


Figure 4.32 Evidence of Contemporary Mohave Use of Land and Resources

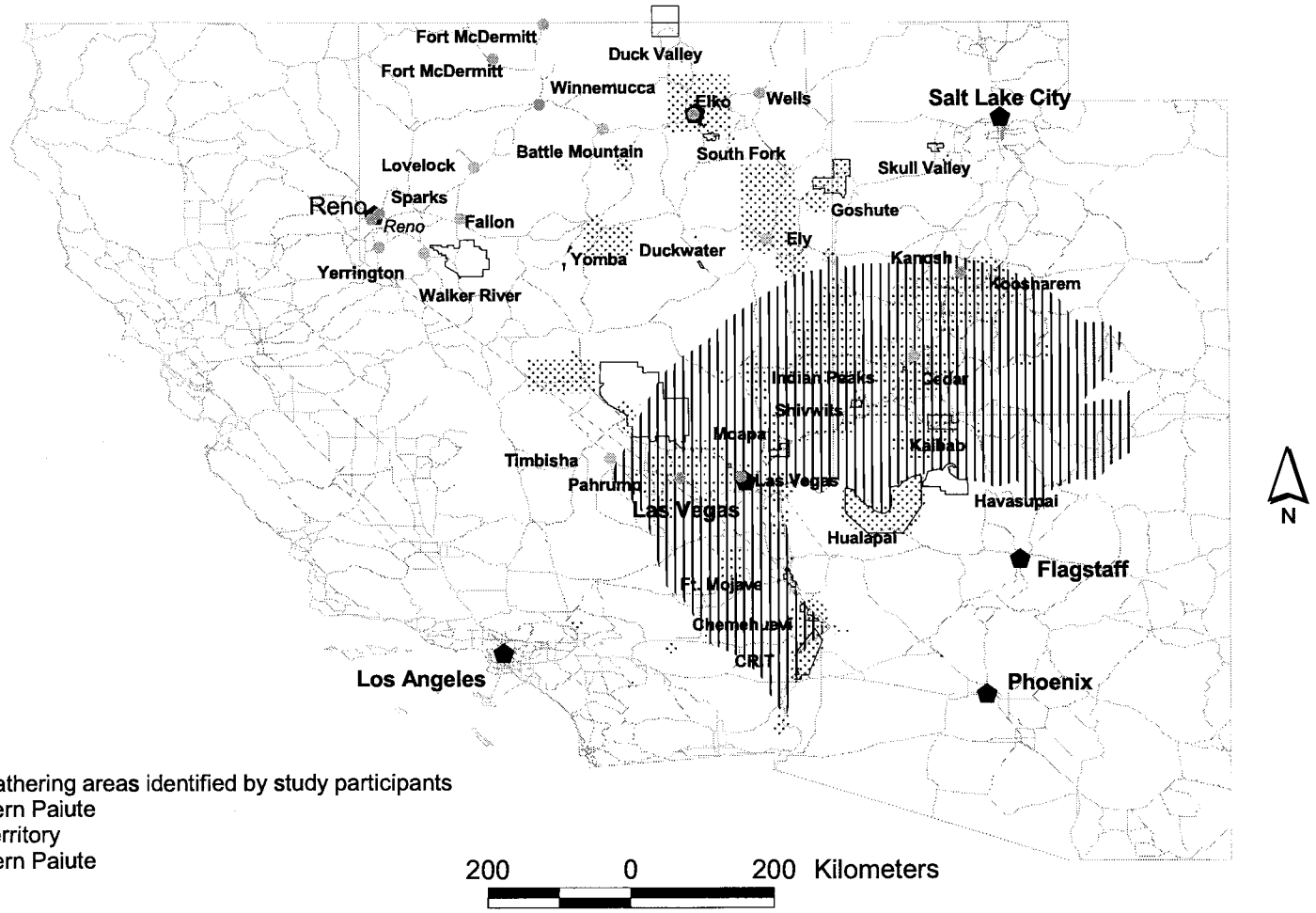


Figure 4.33 Evidence of Contemporary Southern Paiute Use of Lands and Resources

within their traditional territories. In several cases, tribal members hunt and gather in areas outside their ethnic group boundaries. During the interviews, when identifying those places on the study map, tribal members frequently explained their use by citing intermarriage with a member of another tribe or some other sort of tie to the other ethnic group. Responses to the task clearly indicated that, although they may not be able to trace ethnic group boundaries on a map and certainly do not have full access to all areas, many tribal members still define their geography by traditional ethnic group boundaries. Consequently, actions that take place within the boundaries of an individual's traditional territory come under scrutiny. In sum, *members of the tribes participating in the study continue to utilize the land and resources within their traditional areas for subsistence, ceremonial activity, and practicing tribal crafts such as basketry. Some of these resources are located in the immediate vicinity of the proposed LLRW transportation routes.*

Clearly, the tribes participating in the Transportation Study have a direct interest in the proposals to transport LLRW to the NTS. The remainder of this chapter summarizes the types of responses of tribal members to the proposals. A detailed analysis of those responses is provided in the next chapter.

Four Types of Responses to the Proposed Transportation of Low Level Radioactive Waste

The research methodology used in this study, which included interviews with a small number of individuals from each tribe, generally selected by tribal administrators, makes it possible to identify patterns of response. No effort is made to estimate their distribution in the Native American population as a whole. A much larger sample is required for that type of analysis. Nevertheless, the information gathered in this study provides insights into the types of responses generated and some of the reasons for those responses. The next chapter explores links between responses, experiences of individuals and tribes, and what, if anything, participants believe can be done to reduce (mitigate) their concerns.

The responses of participating tribal members can be categorized into four groups: (1) no concern; (2) positive response; (3) generic negative response; and (4) specific negative response. Several participants reported that they had no concerns or that the transportation of LLRW posed no special risks to them or their tribe. Typically individuals with this response viewed the activity to be less threatening to themselves, their families, or their tribes than other nearby activities such as hazardous waste dumps or mines (see Chapter Three). For example, a representative of the Skull Valley Goshute Tribe argued that properly contained radioactive waste was much less hazardous to tribal members than the myriad of hazards the tribe was facing. This individual cited a litany of concerns identified in a recent study conducted in preparation for the tribe's proposal to create an interim spent fuel nuclear storage facility for the temporary storage of high level nuclear waste. These include a hazardous waste facility, the Dugway Proving Grounds, an

Army laboratory that tests biological and nerve agents, a chemical weapons incineration facility, and a low level radioactive waste disposal facility, all of which have been noted for releasing toxic materials to the environment (see Box 4.1).

Only a few individuals offered a positive response to the proposed transportation of the LLRW waste, citing particularly the need to clean up existing contamination and move the waste to a secure location.

The majority of individuals responded negatively to the proposed activities. The two types of negative responses are differentiated by the extent to which the individual elaborated on his or her reasons for opposing the proposed action. The extent to which the participants elaborated on their concerns was linked to the types of experiences they perceived to be similar to the transport of LLRW. First, many individuals regarded anything radioactive as bad, but they did not provide specific reasons for their concerns. These individuals, when describing their experiences related their knowledge of others who had witnessed the atomic testing at the NTS or their awareness of events such as Chernobyl. Many of these individuals focused on the fact that radioactive material would be involved in the transport and responded accordingly. Others focused on the fact that the proposal came from a Federal agency and expressed general mistrust of the idea, the information they were receiving, or the likelihood that their views would be considered.

Box 4.1. Skull Valley Incidents

In 1968 approximately 6,400 sheep died in the Tooele County area, on and near the Skull Valley Reservation. These mysterious deaths were attributed to a possible leak of nerve gas from nearby Dugway Proving Ground, a nearby U.S. Army post. The Army later compensated ranchers, however, they never accepted blame for this incident. Some of these sheep, possibly still contaminated, were buried on the Reservation, causing the tribal members concern. Leon Bear, the tribal chairman, has said that the tribe only became aware that the burials were on tribal land in 1993 (Associated Press 1995).

In contrast, the other individuals who had negative reactions to the proposed transport provided very detailed explanations for their opposition to the proposed actions, including information about accidents they had witnessed and other such events they perceived to have similar consequences as the proposed activities. These individuals frequently elaborated on their concerns, naming the pathways by which the environment and people would become exposed to radiation and describing the ways they believed the information they were receiving was not to be trusted. For example, some suggested that, although they were being told about LLRW, they believed the activity was merely setting the stage for transporting high level radioactive waste in the future. Individuals in this group often interspersed personal observations throughout their comments, moving back and forth between the proposed activity and what they had experienced.

It is important to note that no effort is made to evaluate participant responses about what was being proposed and what might happen as a result of the activity. The

purpose of this study is to uncover existing values and perceptions and present them to the DOE and the governments and members of the participating tribes.

Summary

All 29 tribes and subgroups that were identified for participation in this study were contacted and participated. All arranged for tribal leaders and administrators to meet with the research team; all but two provided names of individuals to be interviewed; and the majority completed the Phase One Supplemental Tribal Survey. The participating tribes generally perceive themselves to be impacted by the transportation of LLRW to the NTS. Their members have traditional and sacred ties to the land across which the trucks carrying LLRW would travel, they continue to utilize plant, animal, mineral, and water resources within their traditional lands in the vicinity of the three routes discussed in this study, and they travel on the routes the trucks use.

The tribal members who participated in the study were interested in the information they received and generally expressed a desire to better understand the activities of the DOE. Their responses are shaped by their experiences as individuals and by the experiences of their tribes and of other Native American people. The specific concerns raised by tribal members are discussed in greater detail in Chapter Five. In addition, the experiences that led tribal members to name these concerns and any actions they believed the DOE could take to reduce their concerns are described in that chapter.

CHAPTER FIVE: INTERVIEW RESULTS - CONCERNS, EXPERIENCES, AND MITIGATION

Allison Fish, Sarah Stewart

The majority of the individuals representing the tribes participating in the American Indian Transportation Study expressed concerns about the transportation of low level radioactive waste (LLRW) to the Nevada Test Site (NTS) along the three proposed routes (see Chapter Four). The purpose of this chapter is to present and analyze participants' perceptions of that transportation and their experiences that lead them to hold those perceptions. As stated in the study's introduction, this is not a risk assessment. No effort is made to calculate or provide numerical determinations of risk or to evaluate the perceptions. Where provided, numbers are used to explore the perceptions, in relation to factors such as tribal and ethnic affiliation, gender, age, and location of residence. Because the number of individuals who participated from each tribe ranged from two to eight (only one tribe had only two participants), symbols are used instead of numbers to indicate a relative frequency of response. For example, Table 5.1 presents the symbols used throughout this chapter to give the reader an idea about how often a response was given. In addition to the summary information, quotations from interviews are used to illustrate the concerns and experiences of participants. These quotes were selected because they exemplify the variety of responses of each type identified. An interview identification number, shown after each quotation, indicates the tribe of the speaker.

Table 5.1. Symbols Used to Indicate Frequency of Response

Symbol	Number of Respondents
X	more than half of respondents from the tribe
/	half or less than half respondents from the tribe
(blank)	no person from the tribe

In this study, participants were asked if they believed they, their families, and/or their tribes would be affected by the transportation of LLRW along the proposed routes in two types of trucks (see Appendix D). It is important to note that participants were directed to talk specifically about the activities being proposed, so these responses are specific to the transportation of *low level radioactive* waste by *truck*. Where some responses may be similar if the transportation of other types of waste or by other modes were proposed, the issues involved in alternative approaches would be sufficiently different to warrant further investigation.

Each individual was allowed to respond to the question in whatever way he or she chose. The purpose of gathering many points of view is to gain a broad understanding of the issue as it is perceived by tribal members. Some participants focused on the *individual* impacts; some focused on the *family* impacts; and some focused on the impacts to their *tribe* or *culture,* including impacts to future generations.

In some cases, participants live near routes that are already used by trucks carrying LLRW. Those individuals are therefore talking about what they have experienced as well as what they might expect to experience. These responses were not separated for this study.

> *You wonder how many times have I driven down this road and pass something that should not have been on this road. It makes me look at trucks differently...I hope that the public could be aware of what is going on...I hope that those people that are getting educated will still have the energy to speak and not give up. They may change their minds and begin to care, people's opinions might change. (YOM5)*

> *Say I'm traveling down the road with my family, and a truck jackknifes or skids in the road, especially during the wintertime. (CRIT2-Hop)*

> *The long term effects - say little kids growing up. What effects might it have on them?... The effect is still the same. It contaminates. I don't know to what degree it contaminates... I look at it this way. Maybe it's not going to affect me, but I look on down the line. I don't want to make a decision that will be bad for someone down the line. (FTM6)*

> *What you're looking at is a small ethnic group that never increases or decreases... but when diseases like this come in, you lose a lot of people earlier. (MOA1)*

> *The government needs to respect our communities locally and near the NTS. They (the government) need to listen to our people, not only the Native Americans but Anglos as well...many of whom have lived in this area for a number of years. (CED4)*

Concerns

As shown in Table 5.2, the overwhelming majority of study participants expressed at least some concern with the transportation of LLRW along the proposed routes. To help the reader review the data in this chapter, the tables are organized by ethnic group and then by tribe, in the order the tribes are presented in Chapter Three. The variable, concern, was examined with respect to gender, age, region, and distance from the proposed route. Because only seven individuals did *not* express concern, no patterns were observed for any of those variables. Table 5.3 shows the percent of participants of each gender and within each age class who reported a concern. As shown in the table, over three-quarters of the individuals in all groups expressed concerns; fewer individuals under 35 years of age expressed concern than any other age class. The source of concern, types of concern, and factors relating to those concerns are all discussed in this section.

Table 5.2. Extent to Which Concern Expressed by Study Participants

Tribe	Concern
Western Shoshone	
Te-Moak Tribe-Battle Mountain	/
Te-Moak Tribe-Elko Band	X
Te-Moak Tribe-South Fork Band	/
Te-Moak Tribe-Wells Band	X
Ely	X
Yomba	X
Duckwater	X
Timbisha	X
Duck Valley	X
Goshute	X
Mohave	
CRIT-Mohave	X
Fort Mojave	X
Southern Paiute	
PITU-Shivwits	X
PITU-Cedar Band	X
PITU-Indian Peaks	X
PITU-Kanosh	X
PITU-Koosharem	X
Kaibab	X
Moapa	X
Pahrump	X
Chemehuevi	X
CRIT-Chemehuevi	X
Other	
CRIT-Hopi	X
CRIT-Navajo	X
Other	X

*Please note that information on the Te-moak Battle Mountain Colony was taken from only two interviews.

Table 5.3. Percent of Respondents Reporting Concern, by Gender and Age

Characteristic	Percent Reporting Concern
Gender	
Male	94%
Female	95%
Age Class	
< 35 years	79%
35 to 55	98%
> 55 years	97%

Source of Concern

The individuals who expressed concern about the proposed LLRW transportation offered two explanations for how transportation of the LLRW would cause an effect: (1) through an accident; and (2) through transfer or radiation from the trucks or impacts unrelated to an accident. The first involves an accident that involves the truck and/or the container in which the radioactive waste is being transported. The second involves effects such as radioactivity passing through the walls of the storage containers or in some other way leaking out of the container, provoking an increased fear among community members due to the proximity of radioactive materials. Table 5.4 shows the distribution of responses related to the source of the impact. To help the reader review these data, they are organized by ethnic group and then by tribe, as outlined in Chapter Three. The tribes are organized into ethnic groups according to the group with which the majority of tribal participants identified.

Table 5.4. Source of Concern About Transportation of LLRW

	Source of Concern	
Tribe	**Accident**	**Non-Accident Transfer**
Western Shoshone and related		
Te-moak Tribe-Battle Mountain	X	
Te-moak Tribe-Elko Band	/	/
Te-moak Tribe-South Fork Band	X	/
Te-moak Tribe-Wells Band	X	X
Ely	X	/
Yomba	/	X
Duckwater	X	/
Timbisha	X	/
Duck Valley	X	
Goshute	X	/
Mohave		
CRIT-Mohave	X	/
Fort Mojave	X	/
Southern Paiute		
PITU -Shivwits	X	X
PITU-Cedar Band	X	/
PITU-Indian Peaks	X	/
PITU-Kanosh	/	/
PITU-Koosharem	X	
Kaibab	X	/
Moapa	X	X
Pahrump	X	X
Chemehuevi	X	/
CRIT-Chemehuevi	X	/
Other		
CRIT-Hopi	X	/
CRIT-Navajo	X	/
Other	X	/

Please note that information on the Te-Moak Battle Mountain Colony was taken from only two interviews.

As shown in the table, accidents are widely perceived to be a source of impact related to the transportation of LLRW. The idea that LLRW could have an impact through another mechanism, such as through a leak or by its presence within the area, was also shared across most tribes, although generally by fewer individuals.

Accidents

The most common source of impacts involves accidents that might occur during the transportation of the LLRW to the NTS (Figure 5.1). In locations near recent spills, such as the 1988 cyanide spill near Cove Fort, Utah (see Box 5.1), almost all participants expressed concern about the potential for accidents. Similarly, several truck accidents that occurred along I-15 in December 1996 were cited as evidence of the problems associated with truck transportation

> *A truck [carrying cyanide] tipped over...We couldn't go up that road, we had to go to Cedar...The next one could be worse. (KAN 3)*

> *The stretch of I-15 near Pintura is really bad, especially in winter. There are a lot of accidents because of snow and slush. (KOO 5)*

> *When they go down that gorge, on the other side of St. George...the trucks go by so fast through there. They tip over and ... there goes your freeway. (KAN 4)*

Figure 5.1. Semi-truck observed along proposed route during the study Note: This truck was NOT carrying LLRW

The potential for accident exists whenever humans and their machines are involved, as noted by many participants (see also "Murphy's Law" section below).

> *People make mistakes. As long as it's a people job, there is always going to be a mistake. And if it's a machine job, it's going to be a malfunction. (GOS1)*

> *...because accidents do happen, nothing is foolproof. They can say that they thought they were ready, but when something happens you can't take it back. (FTM 4)*

> *They are not safe overall. And especially if there is an inspection, who is to say they were inspected properly, or fully. (LVIC 1 & 2)*

> *You have drunk drivers, people get careless. People could have medical problems; a heart attack or a head cold. There are no guarantees that someone driving one of those trucks isn't going to have an accident or put the stuff in carefully. (YOM 5)*

Other Sources

Distinct from concern about accidents and the resulting spills is the concern about the transfer of radiation from the trucks during transportation prior to reaching the NTS, the psychological impacts that would result from having trucks carrying LLRW in the vicinity, and the potential impacts from terrorist activities that are not accidental. Participants generally perceived the impacts of radiation transfer, whether through leaks or not, as similar to those that would result from a spill involving LLRW. Although not as obvious, psychological impacts are as real and significant as the impacts of a truck wreck on the interstate. A woman living in southern Utah described the impact of having trucks labeled as "radioactive" driving through the community where cancer is widespread and which many people attribute to the nuclear fallout from the atomic testing at the NTS (see NTS Experiences below).

Box 5.1: Cyanide Spill Closes I-15

On July 28, 1988, the closure of highway I-15 affected 60 miles in between Scipio and Cove Fort, Utah. The closure was the result of 240 gallons of sodium cyanide briquettes that spilled after a semi-truck carrying 180 drums went around a curve. Sodium cyanide is used in insecticides and electroplating. The truck driver and the highway patrolman who responded to the accident were treated in a nearby hospital. A third truck driver who passed through the area went to a hospital in Salt Lake City due to headaches. All three were later released from their respective hospitals. People that drove through the area during the time of the accident, especially those who stopped to help, were advised to get rid of any clothing they were wearing and to go for emergency care. Traffic was rerouted onto U.S. 89. Since sodium cyanide is lethal, a cleanup crew of five people in special suits came from Woods Cross to take care of the spill on the next day (Jacobsen-Wells 1988).

...pallets could bust open and get a hole in it, seen one when unloading a truck. They could have a spill like that without knowing it. (SHIV 4)

Culturally, I don't think that the metal containers keep everything in. (PAH 2)

If it's just 14 to 16 gage steel, it could be punctured real easily, and that could create a real problem. Or if they accidentally drop one, it should burst open, it could be a problem. (LVIC 3)

Bad, bad – that thing is dangerous...we live close to the highway, it might affect us just going by. (KOO3)

Categories of Perceived Impacts

Distinct from the sources of concern are the perceived impacts that will occur if radioactive materials were released. Seven categories of perceived impacts of the proposed transportation of LLRW were identified during data coding. A review of each category of concern and whether or not it was ever mentioned by members of each tribe is informative. Table 5.5 shows each of the major categories of factors and whether it was never mentioned, mentioned by half or less of the participants, or mentioned by the majority of the participants. As shown in Table 5.5, the topics mentioned in response to the questions about possible effects of the proposed LLRW transportation varied from the belief that there would be direct impacts on the environment and people to concerns about socioeconomic impacts. Environment and human health were the most frequent and widespread concerns mentioned. Terrorism was the least frequently mentioned concern, but it is interesting to note that concerns about terrorism were most often mentioned in central to northern Nevada and among the Southern Paiutes at Chemehuevi, Kaibab, and Moapa.

The perceived effects of the transportation of LLRW along the proposed routes can be better understood by looking at representative statements that illustrate the nature of the responses received. The following sections describe each category of response and include examples of the statements that were coded into the category. In cases where an individual made a statement that expressed more than one type of impact, the statement was coded in both categories.

Environment

This category includes concerns about the contamination of the environment due to the transportation of the wastes through the area. Environmental concerns include specific references to water sources, air, land, minerals, plants, and animals. Traditional Native American lifestyles include frequent interactions with the environment, such as through gathering food or medicine, and those responses are coded into this category. Responses that were identified to be specifically related to impacts on the Native American world view regarding the proper relationships between humans and the environment have been separated into their own category.

Table 5.5. Types of Impacts Identified by Study Participants

	TYPES OF IMPACTS						
Tribe	**Envt.**	**Health**	**Equity**	**Human-Envt.**	**Socio econom.**	**Bad Rad**	**Terrorism**
Western Shoshone and related tribes							
Te-moak Tribe-Battle Mountain Band*		/				/	
Te-moak Tribe-Elko Band	X	X	/	/	/	/	/
Te-moak Tribe-South Fork Band	/	X				/	
Te-moak Tribe-Wells Band	X	/	/	/		/	/
Duckwater	X	/	/	/		/	/
Ely	X	/	/	/	/	/	
Yomba	X	/		/		/	/
Duckwater	X	/	/	/		/	/
Timbisha	X	X	X	/	/		/
Duck Valley	X	X	X	/	X	X	/
Goshute	X	/	/		/	/	
Mohave							
CRIT-Mohave	X	/	/	X	/	/	
Fort Mojave	X	/		/	/		
Southern Paiute							
PITU-Shivwits	X	X	/	/	/	/	
PITU-Cedar Band	X	X	/			/	
PITU-Indian Peaks	X	/	/	/	/	/	
PITU-Kanosh	X	X	/			/	
PITU-Koosharem	/	/	/		/	/	
Kaibab	X	X		/	/	/	/
Moapa	X	X	X	X	/	X	/
Pahrump	X	X	/	X		/	
Chemehuevi	X	/	/	/	/	X	/
CRIT-Chemehuevi	/	/	/	/	/	/	/
Other							
CRIT-Hopi	X	/	/		/	/	
CRIT-Navajo	/	/	/	/	/	/	
Other		X	X		/	/	/

*Please note that information pertaining to the Te-moak Battle Mountain Colony comes from only two interviews.

How do they protect people that may be downriver if there is any [leak] or have they built it in an area where it is below the water aquifer?(CRIT1-nav)

It could harm our forests or different things that are out there...wildlife, we do our pine nut picking out there (DUC4)

I am concerned for any crossing of the Colorado River and we've made these concerns known... If things go into the river, there is any chance of contamination...The caverns, watershed, and basins. They're all contained within the basin. The tribes know about these sites. We've always felt there's a connection between animals, plants, and water. Years ago, when the archaeologists came out... We've always known there was a connection between the Test Site and the Colorado River. I won't say where the sacred places, places

of power are. Then we will get all the new agers out, such as at [...]. The park rangers are telling the stories. It's already happening. There's always the potential of earthquakes; there's an inactive volcano at the NTS I'd say it's still active - subsurface... (CHEM1)

It might affect the herds; men come out from American Fork, they camp way out there. There are antelopes there, they would be affected if they ate the plants. (GOS4)

In addition to concern about the effects of LLRW transportation on plants and animals, one of the most common environmental concerns dealt with accidents along or near waterways. The river most mentioned in northern Nevada was the Humboldt River, which feeds most small rivers which provide the water for human consumption. For a significant number of people along Route C, protecting the Colorado River was a high priority, particularly where the route crosses at the Hoover Dam. People from CRIT, Ft. Mojave, and Chemehuevi all brought up the situation of a truck falling into the river and contaminating the water. In this situation numerous aspects of life could be threatened.

Human Health

Another frequently mentioned response to the proposed transport of LLRW and any accident in which it might be involved is a concern about negative impacts on human health. While many of these responses mirror those given by non-Indians in studies of radioactive waste transportation (e.g., Freudenburg 1991), several respondents spoke particularly of the vulnerability of tribal members, citing a significant loss of tribal elders due to effects attributed to the atomic testing at the NTS, high rates of disease and death, and a lack of adequate medical care. Because many Native Americans throughout the study were impacted by the atomic testing and their story has not been told, a special section of this report is devoted to their story (see Experiences below).

The way that we travel and we use different areas for our ceremonies or our gatherings, just to meet people or to hunt and fish. We live closer to the land because we use it in a different way than, say, a non-native person would use it. When you use most of the animal most of the time, you're more liable to cancer or to other things. I mean, we already have to worry about that because of the testing. We've already had people, I've already had family members die of cancer, bone cancer. We didn't have these diseases before the testing started. I had a cousin die of leukemia, and that actually is because of nuclear fallout testing. They've actually proved that. And, you know, we didn't have these kind of diseases before testing, or before [white] people came here. So we have to worry about our animals and our plants. And the soil, the water, and the people that are affected by it. And the people that don't even know they're affected yet because they don't really have the symptoms yet, cause sometimes it's so slow growth, when you have cancer. (DUC2)

What you're looking at is a small ethnic group that never increases or decreases.....but when diseases like this come in, you lose a lot of people earlier. You lose a lot of people in their early 40's, die of cancer, diabetes etc. (MOA1)

First thing that comes to my mind [nuclear]...death, long term illness. (YOM5)

Equity

In many of the interviews, the participant responded with the question "Why us?" "Us" refers to different classifications of people, including Native Americans, westerners, and Nevadans. Within the category of equity, concerns relate to unfair treatment of one group by another. Often, this response expressed the feeling that one group is being singled out by another. Examples include the government singling out Native Americans, and the east coast pushing off their waste onto the west. A part of the concern expressed by many Native Americans is the reality that their reservations are all the land they have left, and they are not likely to get more land if what they now have becomes contaminated. It is important to note that concern about lack of equity will be heightened by the use of any of the NTS and any of the proposed routes, whether or not there is an accident or a leak of radioactive material.

How do they know the waste will never come out of there [the NTS]? Has it been tested before? Or is Nevada the guinea pig? (MOA 6)

Not bring it up here to the NTS. They are always bringing it up here and ruining everything. It is poison...kill our grandchildren and great-grandchildren. (PAH4)

Some of the tribes, we're from this area. We're not from anywhere else. We're not going to be relocated. We're meant to be here. For ourselves, Chemehuevis, we're people of the desert. If it would get poisoned, we will perish... We're only meant to be here and nowhere else. (CRIT-Chem3)

[Other] people can get up and move. A lot of people do move and everything, but as far as I'm concerned, I'm going to be here forever... Will this do any good? We've been fighting this Ward Valley thing for years and years. Now we have all five tribes involved...Once it leaves them, they have no care in it any more. As long as it leaves them. (FTM6)

People don't want that. Why don't they keep it where it belongs? You know they're hurting people around here. (ELKO2)

The Idaho area is of extreme importance to us as our aboriginal territories...it is important to us because we are dealing with unresolved issues about use of the lands, the government can not show us fair title to that land. (DV2)

Relationship Between Humans and the Environment

Of special concern to study participants was that *allowing* LLRW to pass across the land would have impacts beyond the direct impact to the environment or human health. This category encompasses responses that express beliefs about the proper relationship between humans and the physical and spiritual world that is manifested in the environment. It also reflects the special responsibilities of Native Americans to maintain that relationship. Some individuals whose concerns are categorized here argued that allowing LLRW transportation to occur would further erode Native American culture by forcing tribal members to live with another failure to help protect their traditional lands. This category includes statements ranging from an expression of religious beliefs to a feeling that nature can only bear so much degradation. It is important to note again that the categories are not mutually exclusive, so an individual might express concerns about the environment and about the proper relationship with the environment.

> *Now if we are party to this act that harms Mother Earth, and we all know that it is going to do that sooner or later...how do we connect with the spirits later?...That is a real concern with elders when I talked to them...the Indian elders are concerned with keeping the spiritual connection. We have lost so much of it..." Native people are the first ones that are concerned when there is an environmental issue like this, because they're the ones that lived closest to the land, they're still the ones that live closest to the land. We use most of the animal still today, and we utilize things, plants on the land still today. (DUC2)*

Socioeconomics

Although mentioned less frequently in this study than the previous categories of impact, socioeconomic concerns relate to the understanding that the transportation, an accident or release, or the mere existence of the trucks on the roads would damage the economic prospects of the community or harm anything connected to personal revenue. Factors that fell into this category include concerns of the contamination of livestock, crops, wild game and vegetation, and recreational areas. A number of the participating tribes and their neighbors have begun to develop a tourism industry, and several respondents mentioned that people might be too afraid to come or to travel on the highway.

> *I use this, our land, as a way of life for me. I use the animals to the dead trees and the grasses. The cattle takes care of my family, that's another portion of my income, and, if they're not healthy, we're not healthy, or wealthy. (DV4)*

> *And if anything happens, how is it going to economically impact everybody up and down the river that depend on tourism?(CHEM4)*

Bad Rad

During interviews, researchers observed that many people were aware that radioactive wastes were harmful materials, yet they did not describe specific impacts that would result from

exposure to the materials. "Bad Rad" was created as a category for those responses that were limited to an assertion that radiation was altogether bad. Individuals whose responses were categorized here expressed a general concern for radioactive materials traveling through the area. The concerns that fell into this category did not relate to any specific impact.

> *The effect is still the same, it contaminates. I don't know to what degree it contaminates. I look at it this way - maybe it's not going to affect me, but I look on down the line. I don't want to make a bad decision for someone down the line. With nuclear waste, we don't know how bad it's going to be for anybody, but we don't want to find out either. FTM6*

> *Radiation is radiation, no matter what level it is. It is extremely dangerous no matter how you look at it. (LVIC3)*

> *I sure wouldn't want it close to me. Sitting here, I want to look through the binoculars and see the rabbits...the elks (KAN4)*

Terrorism

Terrorism evolved as a category due to the number of people who talked about the possibility of LLRW being used against the U.S. government and/or communities through which the waste passes. Individuals whose concerns were included in this category feared that the mere presence of trucks labeled with a symbol indicating radioactive materials were present would increase the likelihood that terrorism would occur in their community. Participants were concerned about the possibility of terrorists hijacking a truck, about information about truck schedules falling into the wrong hands, and that just having the waste at the NTS would make the area a target.

> *One of those kids shot a dart through a little cement building It had dynamite in it. It exploded and killed all those kids that were in there. Things like that happen. Like somebody might shoot one of those trucks when they go by. (KAI3)*

> *What if it was hijacked by a crazy person to get even with the government? (ELKO1)*

Factors Influencing Impacts

Imbedded in their discussion of the impacts of transporting LLRW to the NTS, many study participants identified factors that could influence whether or not the impacts they were describing would occur if LLRW were to be transported along the three identified routes. This section presents nine categories that were created to summarize the participants' discussions of factors that influence whether or not potentially negative impacts will occur. These categories reflect individuals' attitudes about the preparedness of communities to deal with any potential impact as well as how and why the transportation could cause any of the impacts mentioned in the above subsection.

Table 5.6 shows each of the major categories of factors influencing impacts and whether it was never mentioned, mentioned by half or less of the participants, or mentioned by the majority of the participants. Following the table is a short summary and examples for each category. As shown in the table, concerns about the roads that were identified for use, drivers, and responsibility in case of an accident or leak are widespread.

Road Location

The location of the proposed routes, in reference to dense populations or sacred sites, was often mentioned when participants were discussing concerns. Issues of road location, depending on the interviewee in question, include that the road was too isolated or that it passed too closely to the home of a relative. Several participants specifically noted where the proposed route crossed a sacred area or a resource area, such as the Colorado River.

> *I have a concern not so much for my travel, but for the area of travel ...If interstate 40 was to have an incident by the bridge up there, then the river would be exposed, depending again on what level they were, would contaminate the whole river. That would hurt almost everybody down below. (CRIT3-Hop)*

> *I would also like to [express my] concern that either one of these [US 95 or ST225] that run right through Duck Valley might be used as an alternate to the Route [A] when it is transported from the north, and we are extremely concerned about this. (DV 2)*

> *There are places of concern such as Spirit Mountain where the Almighty's at...there is also Topoc Marsh and Topoc Gorge where our hunting ground is at and there are the springs which are mentioned in the tribal folklore and songs. (FTM2)*

> *I would suggest or recommend that if at all possible...avoid crossing the [Colorado] River at any point...if there was an accident, like a truck falling off a bridge, that there is no way they could clean it up. (FTM5)*

Road Condition

Distinct from where the road is located is concern about the condition of the proposed LLRW transportation routes. This category includes the physical condition of the road, at different times and in different seasons. Road conditions that were named include windy roads, narrow two-lane roads, roads that become slick in winter, sections of road where black ice forms, and deer crossings. The physical condition of the road was closely linked to participant concerns about accidents.

Table 5.6. Categories of Factors that Influence Impacts of LLRW Transportation

Tribe	Road Location	Road Condition	Road Use	Drivers	Trucks	Monitoring	Jurisdic-tion	Emergency Response	Murphy's Law
Western Shoshone and									
Te-moak Tribe-Battle					/		/	X	
Te-moak Tribe-Elko Band	/	X	/	/	/	/		X	
Te-moak Tribe-South Fork	/	/	/	/					/
Te-moak Tribe-Wells Band	/	/	/	/				/	/
Ely	/	/	/	X	/	/		/	/
Yomba	/	/	/	/	/	/		/	/
Duckwater	/	X	/	X	/	/	/	/	/
Timbisha	X	X	X	/	X	/	/	/	/
Duck Valley	/	/	X	/	/	/	/	/	/
Goshute	/	X	X	/	X	/		/	/
Mohave									
CRIT-Mohave	/	/	/	/	/	/	/	/	/
Fort Mojave	/	/	/	/	/		/	/	/
Southern Paiute									
PITU-Shivwits	/	/	/	X	/	/		/	
PITU-Cedar Band	/	/	X	/	/			/	/
PITU-Indian Peaks	/	X	/	/		/		/	/
PITU-Kanosh	/	/	X	/	/	/			
PITU-Koosharem	/	X	/	/	/	/			
Kaibab	X	/	/	X	/	/		X	/
Moapa	/	/	X	X	X	X	X	X	
Pahrump	/	/	X	/	/	/	/	/	/
Chemehuevi	/	/	/	/	X	/	/	/	/
CRIT-Chemehuevi	/	/	/	/	/	/		/	/
Other									
CRIT-Hopi	/	/	/	/	/			/	/
CRIT-Navajo	/		/						/
Other		/	X	/	X	/	/	X	/

*Please note that information pertaining to the Te-moak Battle Mountain Colony comes from only two interviews.

...the wind can knock you around quite a bit ...on a truck, you see those three [trailers], *when they are all connected together weaving across the road and everything. Now that is scary, to have something radioactive in there, swerving all over the road. (GOS1)*

Say I am travelling down the road with my family, and a truck jackknifes or skids in the road, especially during the winter time (CRIT2-Hop)

Road Use

Road use is a distinct category from road location because it focuses on who uses the road and when they use it. Comments categorized as road use were often general, such as that a proposed route was too busy or used by unsafe drivers. More specific remarks include concerns that individuals' family members use the roads.

It is pretty rough [on the roads]. There are some pretty crazy people out there driving. (MOA 6)

This route scares me because we take our children to the basketball games down to Las Vegas and to rodeos and different things like that. (DV2)

Drivers

Many participants talked about truck drivers and accidents that would be the fault of any of the drivers on the roads during the transportation of LLRW. Concerns about driver qualification, drug use, and falling asleep fall into this category. In several instances, the participants acknowledged that the individuals driving the trucks containing LLRW were likely to be very cautious, but that one could not control the other drivers on the road. Therefore, this category also includes references to the drivers of any vehicles, not just those drivers transporting waste.

If people are used to working in this situation, to them it's no hazard or they wouldn't be working there. To them it's not a hazard and they're not careful. (ELY4)

We don't know how many times they are on the road, what kind of containers they're using, if they're rested. I have been on the road and waited four or five hours because of a wreck and found out the driver fell asleep. (FTM3)

Trucks

In addition to the drivers, participants expressed concerns about the trucks and the storage of the waste material on the truck. This category includes matters related to the waste containers, straps for securing the containers, and the condition of the trucks.

I don't think that the metal container keeps everything in. (PAH2)

How safe are the containers? How much pressure [wind] can they take before something snaps? How often do they change the straps so they are fresh and strong? You never know when its going to snap. How well is the stuff packaged, is it going to break if it falls...can it handle a car hitting it? (KOO1)

The truck itself...would it have any kind of radiation on there? Or do they check it out all of the time. (KAN4)

Monitoring

The perception that the trucks and/or their contents would not be monitored was frequently associated with concerns that the transportation of LLRW would have a negative impact. Many participants were concerned about who was responsible for monitoring the waste during transportation. This category includes such things as monitoring the movement of the trucks carrying LLRW, staffing the checkpoints through which these trucks pass, and ensuring that the containers do not leak the waste. Monitoring was often linked to concerns about drivers, the trucks, and the containers in which the LLRW is transported.

And we don't know if those were really inspected. If they were really inspected, or...This does not make me secure. I mean, I do not like this at all. (LVIC 1,2)

Another concern that I have is how are they going to monitor this? And what is going to insure our future? ...and what is going to insure that they are concerned about our safety? (DUC2)

The following quote from a former truck driver expresses concern for the monitoring of truck driver's habits and therefore falls into both categories of concern :

I wouldn't want to mess around with it myself...knowing how it is to drive nowadays. When I drove about six years ago they had their logs: 10 hours drive, 8 hours sleep, 10 hours driving, etc. But it never ran up like that. How do we know they are doing that, and the safety [checks]? How do we know their truck is in top running condition? (MOA6)

Jurisdiction

The possibility of an accident or leak led respondents to question who would clean up the mess. This concern is salient for issues of transportation; for example, would the responsibility be linked solely to the driver, the company, or would the DOE become involved as well? There was a lot of concern that, should an accident occur and materials move off the interstate right-of-way, the tribes would be dealing with the long term effects of any release of radiation. Participants also questioned the use of contractors and the extent of DOE responsibility. Because

of the widespread concern over jurisdiction and responsibility and the unique legal position of the tribes, this issue is discussed in detail in Chapter Six.

> *Do they just contract with any private trucker, or is it just one company, how are they handling that? (DV2)*

> *Who are the people that are winning the contracts? (LVIC4)*

ER Response

Participants expressed concern over who would respond to the emergency situation (i.e. the local HazMat team or a specialized unit) in the case of an accident or contamination. They also wanted to know if these responders would be trained in dealing with radioactive materials, how long it would take for them and/or their equipment to arrive on the scene. This was a concern especially for tribes in isolated areas and also led to questions about the tribes themselves being properly trained, so this is also discussed in Chapter Six.

> *A few months ago there was a tar truck dumped over on I-15....It was scattered for three miles, and it took them forever to clean it up and try to get it covered, ...I mean, they get in a wreck and they sit there for an hour before they get their people to come out and clean up the radioactive stuff...By that time it's too late." (LVIC1&2)*

> *When something happens and it says it's that kind, I just think about the people around here and how they're going to clean it up. (KAI4)*

Murphy's Law

Finally, a number of participants explained their concern that the transportation of LLRW would result in accidents and/or releases and have significant impacts on the area by stating that things will go wrong. These individuals argued that no matter what safeguards are put in place to protect against an accident or leak, something will go wrong and it is only a matter of time before this occurs. People whose responses were categorized here often expressed a sense of being ineffective and that their opinions did not matter. In other words, they believed that people could not change the course of events.

> *There's always mishaps, no matter how safe you try to be. (DV2)*

> *There are no guarantees that someone driving one of those trucks isn't going to have an accident or put the stuff in carefully. (YOM5)*

> *All these studies will be done but it will be filed in a big thick report and it [the LLRW] will still come through. (ELY6)*

Other Responses

The request for information about perceived impacts frequently led to a discussion of policies related to LLRW transportation and the causes of accidents and spills. The presence of these factors also influences concern about the impacts of the proposed transportation activities. Two such factors permeated many of the discussions about the proposed transportation: (1) mistrust; and (2) lack of information. Table 5.7 shows each of the other categories of concern and whether it was never mentioned, mentioned by half or less of the participants, and mentioned by the majority of the participants. As shown, in all but four subgroups, tribal members linked their concerns to a lack of trust. In all but two tribes and three subgroups, they linked their concerns to a lack of information.

Table 5.7. Other Concerns

	OTHER CONCERNS	
Tribe	**Mistrust**	**Lack of Info.**
Western Shoshone and related Tribes		
Duckwater	/	/
Ely	X	/
Te-moak Tribe-Battle Mountain Band*		
Te-moak Tribe-Elko Band	/	X
Te-moak Tribe-South Fork Band	/	/
Te-moak Tribe-Wells Band		/
Timbisha	/	/
Yomba	/	
Duck Valley	X	/
Goshute	/	/
Mohave		
Fort Mojave	/	/
CRIT-Mohave		/
Southern Paiute		
Chemehuevi	/	/
CRIT-Chem	/	
Kaibab	/	
Moapa	X	X
Pahrump	/	
PITU-Cedar Band	/	
PITU-Indian Peaks	/	/
PITU-Kanosh	/	/
PITU-Koosharem	/	/
Shivwits	/	/
Other		
CRIT-Hop	/	/
CRIT-Nav		/
Other	/	X

*Please note that information pertaining to the Te-moak Battle Mountain Colony comes from only two interviews.

Finally, it is important to note that concern for the LLRW after the transportation, in reference to the long-term storage of the waste, was mentioned by several people from various tribes. However, since this study attempts to focus on issues related to transportation this particular type of data was noted but not analyzed. A short summary and set of explanatory quotes about these two categories can be found below.

Mistrust of Government

A common view shared by many interviewees was a mistrust of the U.S. government's intentions in promoting the transportation of the LLRW waste. Lack of trust in the government because of keeping secrets and lying about the degree of safety and precautions taken fall into this category. The lack of trust was not limited solely to the transportation of LLRW. It was also expressed in relation to previous experiences with broken treaties, earlier nuclear testing, and activities of the military and other Federal agencies.

A number of participants responded to the question about the effects of the proposed LLRW transportation with comments about their lack of trust in the U.S. government. This response is common in studies of perceived risk, and it is especially prevalent among Native Americans, many of whom link this issue to the first interactions between their tribe and representatives of the U.S. government.

> *This area is of extreme importance to us as our aboriginal territories...and it is extremely important to us because we are dealing with unresolved issues about the use of lands...the government can't show us fair title to that land, they can't show how title was transferred because the Bruno and Boise Valley treaties were never ratified by Congress so, therefore, there was never any ceding of the land...and there hasn't been any compensation for those lands. (DV2)*

> *We have lost so much of it...through assimilation and desecration of sacred sites and those types of things that became outlawed by the federal government. We are right on a razor's edge where we have to protect what we have or we will lose it forever. (DV2)*

> *This is our land. Even as far as it goes, they are taking most of our rights away...they've taken it away from us...The Test Site, Sheep Mountain range going up 95, Pahranagunt Valley; all these places that they have there were my ancestor's places...No one can hunt there now. No one would want to hunt there now because of what has been said about those places.*

> *The Navy Base has jets out there and they fly really low. When you call out there they say, 'They're not supposed to be flying that low." We had mirrors break, they terrified my kids [described how children would run inside screaming when they flew over, daughter would get hysterical when she saw planes on TV]...I care about what it did to my kids. (YOM 5)*

Many of the perceived consequences of the proposed transportation of LLRW are intensified by a lack of trust. Not only is there doubt about whether or not the trucks will be adequately inspected, some question whether or not the government will only haul *low level* radioactive waste in them.

> *It is low level, but once you say yes, they are going to bring others besides low level. They have done that stuff before, the federal government. (FTM1)*

Lack of Information

Participants also mentioned concerns about a general lack of information related to LLRW. The management and general knowledge of radioactive waste is very specialized, and many believe that even the experts do not know enough to be generating and spreading these materials. Some specifically said they did not know enough about the possible effects of LLRW to make effective decisions about mitigation.

> *There is a lack of understanding by both Indian and non-Indian communities of the danger of the transportation of radioactive materials. (ELKO4)*

> *I don't know what they are carrying, or when. I only know they want to use the route that I am using. (FTM3)*

> *We don't know what we are ingesting, we don't know because we do not understand! Who is educated to show that this is wrong? Some of us are informed and some are real critical...there should be some kind of warning at some point, not just like we don't know anything. The public should have some knowledge...(CRIT1-Mo)*

NTS Issues

During the interviews, participants expressed numerous concerns about what would happen to the LLRW once it reached the NTS. These concerns relating to long-term storage were not the focus of the information gathering, so they were not analyzed. This category was created to note such perceived impacts.

> *When it rains it's going to rust and corrode eventually sometime. Nothing lasts forever, except radiation. Radiation is forever...if these barrels, for example start leaking the radioactive substance and material, the sheer radiation itself could get into the groundwater and create all kinds of havoc downstream from the area where its stored. (LVIC3)*

> *What happens if they stop using the Test Site? Where would everything go? (YOM2)*

The Nevada Test Site has already been impacted...do you need more impact? What concerns me is how they take care of it after they get there; there have been 673 nuke shots in there. (PAH5)

Analysis of Concerns

Although the methodology does not allow researchers to determine the extent to which tribal members share the concerns that were identified during the study, the responses can be combined together and analyzed for patterns.

Because certain information is shared regionally, such as road conditions and previous accidents the data are also analyzed by region. Six regions were identified, based upon geographic relationship among the tribes (see Table 5.8 and Figure 5.2).

Table 5.8. Tribes in Each Region Identified for the Transportation Study

Region Number	Tribes in Region
1	Duck Valley, Battle Mountain, Elko, South Fork, and Wells
2	Yomba, Duckwater, and Ely
3	Timbisha, Pahrump, LVIC, and Moapa
4	Ft. Mojave, CRIT, and Chemehuevi
5	Skull Valley, Goshute, Koosharem, and Kanosh
6	Indian Peaks, Shivwits, Cedar, and Kaibab

As shown in Table 5.9, there were few differences among regions. All participants in Region 3, which includes those tribes within the immediate vicinity of the NTS - Pahrump, Timbisha, LVIC, and Moapa- and in Region 6, which includes the Paiute tribes living along I-15 and Kaibab, expressed concerns. At least half of all participants in each region were concerned about accidents; more than three-quarters of the participants in Regions 1, 3, 4, and 6 expressed such concerns.

Table 5.10 shows a regional analysis by type of concern. Concerns are generally highest within Region 3. In Region 4, where tribes are very involved in economic development at the present time, especially tourism and the attraction of retirees, concerns for socioeconomic impacts are greatest. Table 5.11 shows the analysis by categories of factors that influence impacts.

Table 5.9. Regional Comparison of Presence and Source of Concern (percent of respondents)

Specific Region	Express Concern	Source of Concern	
		Accident	Non-Accident
1	84%	80%	32%
2	90%	50%	35%
3	100%	80%	55%
4	97%	81%	33%
5	95%	63%	21%
6	100%	77%	55%

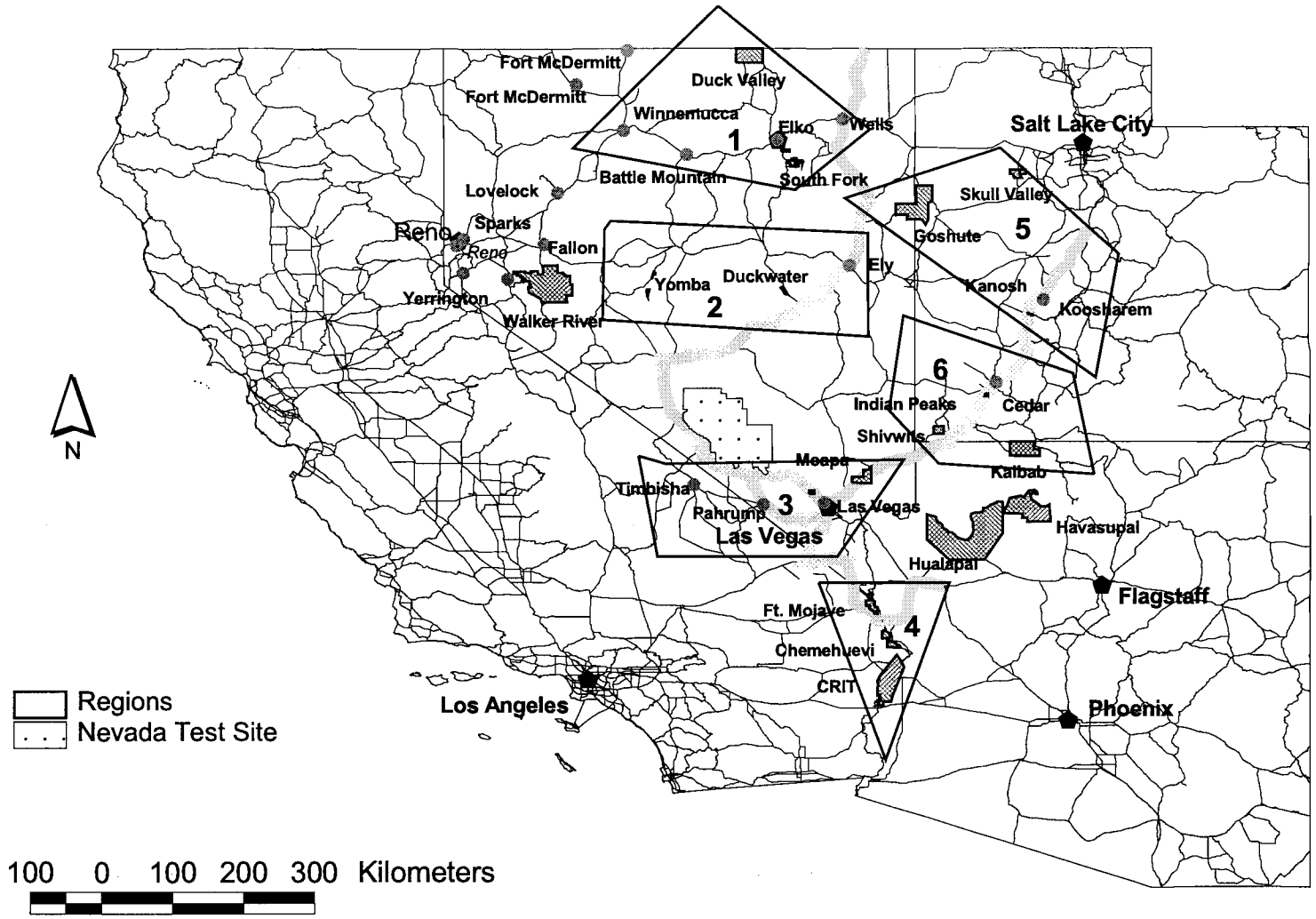


Figure 5.2 Map Showing the Six Regions Identified in the Transportation Study

Table 5.10. Regional Analysis by Type of Concern

Region	Environment	Human Health	Equity	Socioeconomic	Humans & Envt.	Bad Rad	Terrorism	Mistrust of Government	Lack of Info
1	64%	60%	36%	20%	12%	44%	12%	36%	36%
2	65%	30%	25%	5%	15%	30%	20%	35%	20%
3	65%	75%	65%	20%	50%	30%	15%	50%	50%
4	69%	47%	31%	31%	14%	36%	6%	28%	25%
5	58%	53%	16%	21%	0%	42%	0%	21%	32%
6	73%	68%	27%	14%	14%	23%	5%	18%	14%

Table 5.11 Regional Analysis by Factors that Influence Concern

Region	Rd Location	Rd Condition	Rd Use	Drivers	Trucks	Monitoring	Jurisdiction	Emergency Response	Murphy's Law
1	24%	40%	40%	32%	20%	8%	12%	44%	16%
2	30%	40%	35%	55%	15%	25%	5%	40%	30%
3	35%	40%	85%	40%	55%	50%	40%	50%	20%
4	31%	28%	36%	28%	33%	17%	11%	28%	17%
5	37%	68%	63%	37%	47%	21%	0%	11%	16%
6	36%	36%	55%	50%	27%	18%	0%	32%	18%

Experiences

Experiences lead individuals to be aware of impacts. Previous experiences with similar situations can lead to an expectation of what will occur in a new situation. The experiences a person has had that are perceived to be related to the transport of LLRW influence the concerns that are shared during an interview. In addition, past experiences also influence whether or not individuals believe anything can be done to reduce their concerns.

> *For fifty years the tribes have been left out of the loop on this nuclear energy information. Now we have to do fifty years of catching up in a ten year time span. Some of the people, where things have begun to leak have begun to experience the hazard of living near these areas. (CHEM1)*

There was a spill at the Naval base ... something toxic, a couple of years back. The big thing is, everything is hush-hush. It don't hit the news. You just hear it by accident, those people that don't come across it don't realize nothing happened. You can never take it as what has actually been said ... The government really hasn't shown you how much to put your trust in them in the first place. You learn not to believe what the government says is true, actually true (YOM5)

> *We know where there have been exposures to radioactive dust, even the low radioactive, what it has done. I have come into contact with people who have been exposed. Not only here in the States, but overseas ... I have been into clinics ... what they are doing is affecting our way of life. People are in contact with the land, there is a big interference with us. It is very hard to describe. (TIM2)*

Types of Experiences

In this Transportation Study, participants frequently named experiences they had had or had heard about that they related to the proposed transportation activities. These experiences are termed *perceived analogous events.* Individuals use such events to help them understand what is being proposed to them. Two types of experiences were identified. Some participants had direct experiences and formed their ideas about radioactive waste through first hand knowledge such as working as a truck driver or in a waste facility or being in a car accident. Others had indirect experiences in which individuals only heard or read about a situation. Indirect experiences are learned about secondhand, such as through movies, rumors, news about spills, or a relative or friend who had a job connected with radioactive waste.

Because many participants had not yet directly experienced the transportation of low level radioactive waste, they had to rely on these perceived analogous events to help them anticipate the effects of such transportation. The type of experience also influenced

both the source of the concern and the factors that influenced those concerns. For example, knowing someone who contracted cancer after exposure to radiation led a participant to talk about human health effects. Similarly, having been in or heard about a wreck involving a large truck led a participant to talk about drivers and road conditions.

The relationship between the perceived effects of the transportation of LLRW and prior experiences and information was explored directly in this study by asking participants to describe their experiences. The majority of individuals named experiences, as shown in Table 5.12.

Table 5.12 Number of Participants Who Named Experiences

Experience	Number of Participants		Experience	Number of Participants
Media Coverage	38		Observed Changes in the Environment	46
Wrecks, Semi-truck accidents	63		Experience with Emergency Response	44
Road Conditions	16		Experiences with a Facility other than NTS	64
Human Health Problems	56		Experience with Federal Agencies	36
Seeing Trucks Carrying Radioactive Materials	28		Other Types of Spills	31
Experiences with the NTS	36		No experience linked to LLRW Transportation	7
Experiences at Work	30			

Description of Experiences

Media

Many people have acquired some information from the popular media. Mention of the
news, documentaries, and movies fall into this category.

Semi-truck Accidents/Wrecks

Many people had seen accidents along the road, had been in accidents themselves, and had relatives killed in accidents. This led to the formation of some concerns and mitigation responses.

Road Condition

In the previous section about concerns, many people were worried that the conditions of the road could factor into causing an accident. Since people live along the proposed routes they were aware of hazards along routes that they had experienced themselves.

NTS Experiences

Many people cited events related to the NTS as experiences that led them to express the concerns that they did. Their experiences with the NTS were largely associated with the atomic testing that was carried out there beginning in the 1950s (see Box 5.2). Communities to the east of the NTS generally have been identified as the "downwinders," those living downwind of the NTS and most heavily impacted by the atmospheric testing of atomic weapons. Nevertheless, during the Transportation Study, tribal members from areas on all sides of the NTS, such as Goshute, Duckwater, Pahrump, Timbisha, and the Colorado River tribes, reported seeing the atomic tests. Some people spoke of watching the early nuclear detonations as children (See Box 5.2).

Other NTS experiences range from observing the fallout, visiting the site, and seeing animals and plants that were affected by the radiation to having heard others talking about dead plants and deformed animals they had seen on the NTS and in the surrounding areas. Many participants know someone personally who has cancer or has died from cancer that is believed to have been caused by exposure to radiation from the NTS. In addition, some individuals had been employed at the NTS, others felt the NTS impacted them via environmental or spiritual mechanisms (the NTS contains sacred sites to different Native American groups).

> *We have a lot of hot spots around here, especially in the southern area, because [we are] probably within a 200 mile radius from the Test Site... We're not considered actual downwinders, but we are, in a sense, close enough to being called this because we were close enough to the Test Site. And most of the time, in DOE classified reports, when they had to report things, they would let off the atmospheric testing when the winds would blow in sparsely populated areas, which were mainly native areas. Like the Shivwits Paiutes, the Goshutes, and like Shoshones up in this way, up north from the Test Site. So that there wouldn't be concern of big populated areas - that was their concern - they would wait for the winds to blow away from those areas, so they wouldn't affect large groups of people. (DUC2)*

> *We're pretty much concerned about all of it. We're concerned about contamination and the hazards that come along with it - sickness... It has been a deep, dark secret. My brother used to tell me, when they did the tests up there, he could see the glow in Parker Valley. (CHEM1)*

It's already impacted us, the testing. We have proof that people died of cancer. They are losing their hair, have leukemia. We never had any sickness. People after me, they have more sickness, allergies, leukemia. I was one of the ones in the direct fallout. Me and my brother was right in the middle of it. We ended up being very sick - we had diarrhea, weight loss... We didn't have running water at that time. We used outhouses. They took us to Ely and diagnosed it as pneumonia. I've been scared of it ever since - when they talk about mining [and other things]. We have had traditional people come down and clear the roads. People worked for mining. That's the way people are - mining, nuclear testing. If there are jobs, Indian people will take them. (DUC7)

Human Health

Many participants tied their health conditions and that of their families and the surrounding community with the presence of hazardous materials in general. The transportation of LLRW was often perceived of as another of these materials, like pesticides. Downwinders argued their tribes already had been affected by nuclear fallout from testing (see NTS Experiences and Box 5.2).

I heard people were getting sick over there [in Gabbs] from that waste [at Beatty]. When they put that there they said a lot of people got cancer from it. (ELKO2)

I have a brother that had tumors removed, a sister that had a tumor removed from her breast, the rest have hysterectomies – everyone but myself. I left here when I was thirteen and did not come back. All of the things the other people have I do not. They have lived here all their lives. My brother has leukemia. Three out of six have cancer. (ELY2)

Seeing the Trucks

People, for the most part, were uncomfortable when they saw trucks marked as carrying radioactive materials. Many participants related the experience of seeing trucks, regardless of their contents, to be unsettling due to the behavior of drivers on the road.

Employment Experiences

Since interviewees were recommended by the tribe some were chosen because of their occupations gave them some familiarity with hazardous materials. These included medical workers, fire fighters, NTS employees, truck drivers. There were also other occupations which necessitated training about hazardous materials.

I worked at the [motel]. I had to handle waste - drug rooms, suicide rooms. We had to go through training - mostly chemical stuff. I worked at [...]. We had a freon spill. After they cleaned it up, you could see there was stuff left behind. We had to learn a lot on our own. I have seen spills in a plant in a controlled area, but freon is slippery till it evaporates. (GOS1)

Environment

Respondents sometimes discussed changes in their environments due to human intervention. Certain individuals cited the health and quantity of animals that they hunted and plants they gathered. Other responses included contamination of water sources by sewage facilities, mining operations, and agriculture.

As far as hunting last time I got a license was three years ago, usually after a kill I check the liver to see if they're healthy...Last buck the liver was so bad I was hesitant to eat the meat, the liver had white cysts all over it. Now deers migrate through the state so it could have come up from the NTS area. (ELKO6)

What they are doing is affecting our way of life. People are in contact with the land. There's a big interference with us. It's very hard to describe. It's something a lot of people don't understand. They don't know. The old people knew. We no longer eat the right foods... They've always said, "We eat with the seasons. We don't go there otherwise. Don't impact the place. Only go there to scout around and to pick. Don't go there otherwise." [discusses food] They're going back to the same thing - what we have always talked about. We would not gather along the roadside where there are fumes. We would not gather where there are human impacts. Now people are taking their dogs on hikes. You have to be a real good tracker of tracks... you can't tell if it's a bobcat or a plain dog. Now we go walking and try to teach the children. We see all the dog tracks. You cannot use the area around here because people are walking their dogs all over the place. They talk about how the water is being used today. There's nothing down here. We're all dried up. Lakes and streams are going down because it's being used somewhere else. We don't have rain. It affects the plants. The plants get their own diseases, attract insects. Mother saw mistletoe growing on the pine and cedar trees. That never had occurred before. There are parasites on the little plants. They also believe it is due to the misuse of the lands, misuse of the environment. (TIM2)

Emergency Response

This category describes people's experiences with emergency response teams in other situations of danger. This situations include hazardous material spills and accidents. Some instances referred to response times, while other people recalled inadequate clean-up (see Chapter Six).

Non-NTS Facilities

Experiences that people related to the information about hazardous materials came from places other than the NTS. These include mines, Chernobyl, power plants, Ward Valley, Yucca Mountain, Beatty, and several others. Many participants were aware of reports that the Bureau of Land Management had found that materials from the low level radioactive waste facility at Beatty, Nevada were moving through the soil toward the groundwater.

> *I'm concerned about what happened in Beatty...I attend as many low level meetings as I can to try to find out more. I hear conflicting things. No one said lined or unlined is better. I wish they would have figured that out before they started burying this... I have a big concern. I think the world developed something they can't handle. Not just this country... (CHEM3)*

> *I am especially concerned about the water. I raised issues about the Beatty site. It is amazing to see the hazardous site next door to the low level radioactive waste site. The aquifer that runs through Beatty Valley ultimately comes out at Pahrump. It was named because of where water gushed out of the rocks and mountains there. (CHEM1)*

> *Rio Teno mine holding ponds with cyanide mix for leaching copper, overflowed and got into the river and killed all the fish all the way to the diversion dam...Now trying to clean up the Rio Teno mine, it costs money. Who is going to pay for it? (DV5)*

Federal Government

As mentioned in the concern section, mistrust of the government often stems from previous dealings with government agencies. Tribal members named experiences with treaties in which one thing was said and another was done. Others cited a lack of real government to government relations with federal agencies (see Mistrust).

Other Types of Spills

Participants who had witnessed spills of any material in their area related those spills to a possible spill of radioactive material due to transportation.

No Experience

Finally, a few individuals did not relate their concerns to prior experiences.

Box 5.2: NATIVE AMERICANS AND ATOMIC TESTING AT THE NTS

The Nevada Test Site (NTS) opened in 1951 and has been the site of most of the U.S. atmospheric and underground tests. The response of many Indian participants was affected by their experiences related to the above ground atomic testing of the 1950s. Until the late 1970s, little national attention was given to individuals and communities that had been impacted by the atomic testing that occurred at the NTS. Even after these people, who have come to be known as "downwinders," were brought into the public consciousness, the affected Native American populations were generally ignored.

For example, in the book *Justice Downwind* (Ball 1986), which describes the impacts of the testing on downwinder communities such as St. George, Utah, almost no attention is paid to Native Americans and their concerns. Although the Shivwits Paiute reservation is located just outside of St. George, only one mention is made of Paiutes in the entire book. According to the author, after information about the federal government's knowledge of the dangers of exposure to radiation became public in 1978, several citizens organizations were formed. For example, Citizens Call was organized in 1978 to provide assistance to people of southern Utah, Nevada, and Arizona suffering from cancer attributed to the atomic tests conducted at the NTS in the 1950s. During an appearance before a congressional committee, the organizer of Citizens Call expressed concern about the impacts of the testing on the Paiutes. Because of their reliance on deer, rabbits, and pine nuts during the 1950s, the organizer argued,

Their exposure had to be at least as great as any of the rest of us. A lot of them did not even have the benefit of food coming in from the outside, as some of us did when we went to the store to buy our food... Some fair remedy must be made (U.S. House of Representatives 1982:29; quoted in Ball 1986:97).

When the information about contamination was finally shared with the Southern Paiutes, they were warned not to gather or eat plants and animals from the area. These comments from two elders participating in ethnobiological studies during 1995 and 1996 indicate that they continue to avoid their traditional gathering areas:

"But nowadays you can't drink the isi juice anymore because of the atomic bomb that came through here and eat your tongues out and maybe there's some kind of a poison in it or something else come in. We had a lot of it growing on our reservation..."

Responding to the question, "Do Southern Paiutes still use Prairie Dogs?" one elder commented, "Not now 'cause since they had that atomic bomb it's all [contaminated]."

Mitigation

Study participants were asked if there was anything they believed the DOE could do to reduce their concerns about the transportation of LLRW along the proposed routes. As shown in Table 5.13, 26 % of the participants did not believe anything could be done to reduce their concerns. Many of these individuals were opposed to the transportation of LLRW and felt that any suggestions of ways to reduce their concerns would indicate that they could be convinced to accept the transportation option. These participants felt that nothing could be done to ensure the absolute safety of people along the route and that any suggestions of mitigation could lead to compromise.

> *People who made the decision to put the waste here should move and live in the NTS. If they are not willing to do that, then I do not think they should make the decisions they are making...I want to go back to the DOE. They are a part of the federal government, the government is supposed to work with us on a government to government relationship. I don't see them ever doing that. (CHEM2)*

Table 5.13. Response of Study Participants to Possibility of Mitigating Their Concerns

Characteristic	Individuals Who Argue No Mitigation is Possible
	26%
Gender	
Males	23%
Females	29%
Age Class	
< 35 years	24%
35 to 55 years	26%
> 55 years	31%

For the remaining participants, ideas about mitigation were frequently linked to their concerns and experiences. For example, one issue that was discussed was the extent to which trucks carrying LLRW should be visible. Participants concerned with accidents that might occur when family members were on the roads frequently stated that the trucks should be colored to be as visible as possible. Conversely, individuals concerned about the use of trucks carrying LLRW in terrorist activities argued that the trucks should be as inconspicuous as possible. One solution to this issue, suggested by some participants, would be to label routes that were used for LLRW so individuals could avoid them if possible and desired.

Behavior Change and Mitigation

Related to the perception of impact is the intent to change one's behavior if the transportation of LLRW were to actually take place. As shown in Table 5.14, individuals responded to the question about changing their behavior in one of five ways.

Table 5.14. Individual Responses to Question About Changing Behavior

Response	Number of Individuals
Would not change behavior	34
Could not change behavior	26
Would worry more	27
Would change behavior	41
Uncertain or did not respond	14

Types and Description of Mitigation

In addition to the statements that nothing could be done to make the proposed transportation of LLRW more acceptable, interviewees produced a variety of responses when asked about what the DOE might do to reduce their concerns. Many people had suggestions that they thought would reduce the risks associated with transportation of LLRW. In this section, these ideas have been categorized around common themes, as shown in Table 5.15. For example, many people suggested traveling at night in order to avoid congestion along the routes. However, many other people said travel during the day in order to prevent accidents caused by the darkness. For the purposes of this report these were put together into one category called "travel times."

Table 5.15. Categories of Mitigation Responses

Category of Mitigation	Number of Individuals
No Mitigation	46
Driver Qualification	17
Condition of Trucks	54
Speed of Transport	25
Route Choice	40
Time of Travel	18
Monitoring	29
Emergency Response and Notification	49
Other Methods of Transportation	7

No Mitigation

As stated above, many people felt that there was nothing the DOE could do to improve the level of safety associated with LLRW. This group includes also people who were opposed to the transportation of LLRW and therefore a mitigation response would

be a sign of supporting the DOE. It should also be mentioned that there were respondents who simply had no suggestions.

Driver Qualifications

Many people thought that the DOE should be very careful about who was permitted to drive the trucks. Most of the suggestions centered on keeping the driver focused and alert. These include suggestions about drug testing (many times for stimulants) and letting two people drive at once.

Condition of Trucks

There were suggestions about improvements for the trucks such as sturdier containers, newer models, and a better method of attaching them to the trucks. A lot of suggestions were that the trucks should be labeled in an obvious way so that any other drivers on the routes would be more cautious.

Speed of Transport

Many people thought that the best way to ensure safer transportation of the material was to get it to the test site as quickly as possible. In many cases it was felt that the less time spent on the road would lead to less potential for accidents. This covered suggestions like drivers not being allowed to make any stops or having two drivers that alternated driving time.

Other people wanted the trucks to go as slowly as possible, making frequent stops as needed. Sometimes this included mitigation ideas concerning not giving the drivers the incentive to travel as quickly as possible. Many expressed concern that the trucks traveled too fast and that speed limits should be reduced or more heavily enforced to keep trucks from speeding.

Route Choice

Many times people felt that one route was safer than another. This could stem from several reasons including road conditions, road locations, etc. There were also respondents who thought that the DOE had chosen the best route possible.

These are suggestions that deal with improvements for the roads such as making lanes wider or allowing for additional lighting along the route. These also include suggestions for warning signs along the route as well.

People also felt safety could be improved if certain areas like rivers and sacred sites were deliberately avoided.

Some said the best way to ensure safety was to construct either a separate road or lane solely for transporting radioactive materials.

Time of Travel

Many people thought that restricting the time of day that a truck could travel would bring improved levels of safety. As mentioned before this includes things like travel only at night or travel only during the day.

The probability of accidents was thought to be heightened during certain seasons and as a result suggestions were made against traveling in winter.

Monitoring

These are suggestions for officials whether in the Department of Transportation or the DOE to pay close attention to where the trucks are and when.

Another suggestion was for tribes to have some control by being equipped to set up checkpoints that the truckers would have to go through.

Several people felt that additional precautions like testing the water should be made so that people would be better protected.

Emergency Response and Notification

There was a lot of concern for the preparedness of people in case of an accident or leak (see Chapter Six). Several suggestions include providing the proper training and equipment in the case of an emergency.

> *We need courses and updating the communities on handling toxic waste. A lot of us would not know it if we came upon it. (KAI6)*

> *There should be money for training local agencies – fire departments, ambulances, etc. Are the cities going to have to raise taxes for all of that stuff? (FTM2)*

> *Definitely have an emergency response team set up and fully funded within each one of these communities and some sort of monitoring so each community has access to the transportation company – safety records, whatever information they need to monitor; so they have a comfort level, are a part of the process, involved with it. (TIM3)*

More information is a category to account for the people who stated that in order to make decisions they as individuals or as communities needed more information about the ramifications of LLRW.

Notification was a suggestion that people met with varied reactions. Some felt that people should be notified as to when the trucks were coming so that they could possibly avoid traveling at those times. Others thought that it would be safer to keep the truck schedules secret in order for fear that the information would fall into the wrong hands.

Other Methods of Transportation

Some people thought that there were better methods of transportation than the suggested trucks and routes. These include railroads, military transport, using boats, and shooting it into outer space. The possibility that rail would be used was raised by several participants, but it was not until midway through that study that this was mentioned by the DOE (see Box 5.3). Other than being recorded when mentioned by one of the participants, rail transportation was not discussed in this study.

Suggestions Regarding Handling of Waste Once it Reaches the NTS

Although this study focused on the transportation of LLRW, many participants also commented on the disposal of the waste at the NTS (see Concerns above). Recommendations were made for handling the waste once it arrived at the NTS. For example, "line the trenches better" was a frequent recommendation for once the waste had arrived at the NTS.

Box 5.3: INTERMODAL TRANSPORTATION OF LLRW

Since this study was designed and conducted (see Chapters One and Two), the DOE has begun consideration of another alternative for transporting LLRW to the NTS. In conjunction with the Office of Environmental Management's plan to accelerate the cleanup of DOE facilities throughout the nation, a proposal has been made for considering *intermodal* transportation. In this usage, intermodal refers to the combination of two or more *types* of transportation. For example,

The proposal to speed up the cleanup is being made in an effort to reduce the DOE's environmental liabilities such as "the risk and future cleanup costs associated with environmental contamination, hazardous and radioactive materials and wastes, and contaminated buildings and facilities" (DOE 1997:1). With the acceleration of cleanup will come an increase in the amount of LLRW that is to be transported to the NTS. To accommodate this increased activity and respond to the concerns expressed by many people, Indian and non-Indian, about the transportation of LLRW along the proposed highway routes, the DOE is also proposing the use of a combination of railroads and highways to get the waste into the NTS. The impacts of such transportation will be the subject of another study.

Summary

Participants in the American Indian Transportation Study raised numerous concerns about the transportation of low level radioactive waste (LLRW) across or near their tribal lands. Some of the concerns are similar to those raised by non-Indians when faced with such transportation near their homes and towns. Others are unique to the unique social, cultural, and political situations of tribes in the U.S. This chapter has described those concerns in detail and demonstrated how concerns are linked to one's experiences with situations and events perceived to be analogous to that being proposed. Finally, the chapter provided the responses of the Indian participants to the question of whether or not the DOE could do anything to mitigate or reduce tribal members' concerns about the LLRW transportation. Many participants argued that nothing could be done to mitigate their concerns. Others suggested various activities, ranging from improved notification to support for tribal emergency response teams. The following chapter discusses tribal issues related to jurisdiction and emergency response.

CHAPTER SIX: JURISDICTIONAL ISSUES REGARDING TRANSPORTATION

Diane Austin

The special relationship among Native American tribes and the U.S. federal government was discussed in the introduction to this study. That relationship carries specific legal responsibilities for both the tribes and the federal government. This chapter discusses the question of who has jurisdiction over the transportation of low level radioactive waste (LLRW) where the waste crosses tribal land and where responsibility lies for protecting people and the environment while the waste is being transported. Although only three tribes appear to be directly on one of the three routes proposed for the transportation of LLRW in this study, several other tribes expect that the trucks carrying the LLRW will cross their land. These tribes and their concerns are also included in this chapter.

As discussed in Chapter Five, among the concerns raised by many of the participants in this study are questions about who is responsible for the waste and any accidents or leaks that may occur during the transportation of the LLRW across tribal land. Shipments of LLRW have been going to the Nevada Test Site (NTS) for more than twenty years and the Department of Energy (DOE) has provided training to civil first responders in Nevada. However, most tribes have not been part of this activity. The relationship between tribes and the federal government is continually evolving and tribes are increasingly moving toward self-government. As this occurs, their responsibilities grow. In this chapter, the concerns of tribal participants are presented and an interpretation of tribal responsibilities related to the transportation of LLRW is provided. A more complete legal interpretation is provided in Appendix J. Although this chapter focuses on LLRW, many of the issues raised here are relevant for other types of hazardous material transportation by truck.

Nature of Tribal Concerns About Jurisdiction on Tribal Land

Throughout the U.S., federal and state highways cross Indian Country. Within the study area, the proposed routes for transporting LLRW include sections of federal and state highways that (1) cross tribal land, (2) pass over or within tribal communities, and (3) pass near tribal land at border checkpoints where trucks are known to cross tribal land to avoid the checkpoints. This section describes each of those situations.

Crossing Tribal Land

The tribes for which the proposed LLRW transportation routes go directly across their land include:

Fort Mojave Tribe
Las Vegas Paiute Tribe
Moapa Paiute Tribe

For these tribes, the reason for their concern is obvious. A raised portion of I-40 arches over the homes of Fort Mojave tribal members. In a recent accident, a semi-truck fell off the interstate and landed within the community. In that case, the truck was carrying non-toxic materials. Nevertheless, tribal members are concerned about how they would manage accidents and coordinate emergency response if such an incident involving a truck carrying LLRW were to occur.

> *We had an accident in February ... coming into Needles. A semi went off the interstate and over and onto the street at the bottom of the underpass. I think the driver fell asleep at the wheel. (FTM6)*

Passing Over or Within Tribal Communities

Members of several of the participating tribes live in communities within or immediately adjacent to non-Indian cities and towns that are along the proposed transportation routes. The following tribal communities would be directly impacted by an accident or leakage occurring when a truck was passing them:

Ely Shoshone Tribe
Las Vegas Indian Center
Pahrump Paiute Tribe
PITU-Cedar Band
PITU-Indian Peaks
PITU-Kanosh
Te-Moak Tribe-Wells Band
Timbisha Shoshone Tribe

Residents of these communities have experienced truck wrecks and spills and want their tribes to be prepared for future incidents (see Chapter Five). For example, Wells tribal members were concerned that in the event of an accident, the closing of US 93 near the town would result in traffic being rerouted through the community, as has been done in the past. During an incident four years ago, a hazardous material spill closed the highway for nearly 18 hours. During this time, highway traffic was channeled along a road within view of the Wells Colony day care center.

> *Four years ago there was a hazardous material spill, it closed down Highway 80 for about 18 hours...The trucks used old US 40 as a bypass because the bridge was closed ... It cuts right past the reservation, about a block from the smokeshop. The maintenance crew worked around the clock [and] sent a haz mat team out from Salt Lake City ... some kind of chloride ... It would have gotten toxic if it had rained [and] we would have been in a direct line, the wind comes from the south ... (WELLS2)*

The proposed route through Las Vegas passes within several hundred of the Las Vegas Indian Center along I-95. Individuals who work at or frequently visit the Center would be affected by the trucks if they traveled during the day.

Passing Near Tribal Land At Border Checkpoints

Members of three tribes expressed concern that, although their reservations did not appear to be along the proposed routes, they expected that if the proposed routes were selected the trucks carrying LLRW would cross their tribal land. The tribes with these concerns are:

Colorado River Indian Tribes - Chemehuevi, Hopi, Mohave, and Navajo
PITU-Shivwits
Shoshone-Paiute Tribes of the Duck Valley Reservation

In all three cases, the reservations are located on or near state borders. The tribal members have direct experience with trucks that leave the main highways and cross through their reservations to avoid checkpoints. According to the study participants, some of whom are former truck drivers, the truck drivers take these routes because they are carrying more weight than allowed, are not sleeping enough, or do not know what is in their trucks. Thus, these tribes raised the same concerns as the tribes that are directly on the proposed routes.

Duck Valley is situated half in Northern Nevada and half in southern Idaho. The major road system running through Duck Valley reservation is ST 228, running parallel to US 93, 60 miles to the east. At the Nevada/Idaho border there is a truck checkpoint along US 93, Route A. It is a common occurrence for truckers to use ST 228 as a detour in order to avoid this checkpoint, especially if they are running heavy or not resting often enough, both common reasons for accidents.

> Although, I have heard that they [trucks carrying LLRW] do come through here at night ... I don't live very far off the road and at night you can hear whether it is a car or a truck (DV4)

Other

Although concern about jurisdictional issues was highest within the tribes discussed above, individuals from other tribes also raised concerns about jurisdiction and the need for coordinated emergency response. Some tribal members talked about truck drivers that get lost and are found within their reservations. Others identified routes that have become heavily traveled, particularly in certain seasons. For example, although I-40 was shown to be the proposed LLRW transportation route, truckers and tribal members argued that trucks use I-10 instead during the winter months because of snow in the mountain areas around Flagstaff and use US 89 and ST 389 in the summer months as the fastest way to Las Vegas. Tribes have already experienced these events and express concern about their responsibilities and preparedness to deal with trucks carrying LLRW.

Summary

Many tribes, both those directly on the proposed LLRW transportation routes and those nearby, are concerned about the jurisdictional issues surrounding the transportation of LLRW. Their concerns include: (1) developing the capacity to manage accidents and leaks involving the trucks; (2) coordinating emergency response with federal and state highway patrol and other agencies; and (3) controlling the trucks carrying LLRW.

Legal Aspects of Jurisdiction and How Tribes Are Responding

Control and regulation of U.S. highways is governed by the U.S. Constitution, federal, and state laws, and specific right-of-way agreements. This discussion is intended to clarify the general responsibilities and rights of tribes regarding trucks carrying LLRW that come onto their tribal lands. However, because right-of-way agreements are established at varying times and under varying circumstances, and are specific to highways and highway sections, a review and analysis of those agreements is beyond the scope of this study. Nevertheless, to fully understand the jurisdiction over the roads, emergency response, and other aspects of transportation, the DOE/NV should investigate those agreements in detail. This section will address, in general, the three types of concerns raised by tribal members: (1) developing the capacity to manage accidents and leaks involving trucks carrying LLRW; (2) coordinating emergency response with federal and state highway patrol and other agencies; and (3) controlling the trucks carrying LLRW.

Developing the Capacity to Manage Accidents and Leaks Involving Trucks Carrying LLRW

Legal Requirements

Title III of the Superfund Amendments and Reauthorization Act (PL 99-199, 42 USC 9601-9675) directs State Emergency Response Commissions to establish, coordinate, and supervise emergency planning districts and Local Emergency Planning Committees. Title III has two purposes: (1) to encourage and support emergency planning for responding to chemical incidents; and (2) to provide local governments and the public with timely and comprehensive information about possible chemical hazards in communities. The Title III program provides funds for training first responders on hazardous, including radiological, materials. Under Title III, no special attention is paid to tribal governments.

The general lack of tribal infrastructure for planning, developing, and implementing environmental protection programs in Indian Country, including emergency response capabilities, is well known. For example, in the 1986 *Survey of American Indian Environmental Protection Needs on Indian Lands*, only 11 of the 48 participating tribes reported any program for emergency preparedness/evacuation (Americans for Indian Opportunity 1986). A 1991 study of hazardous waste facilities on tribal lands identified the lack of resources for tribes to operate

regulatory programs and jurisdictional disputes over environmental regulations as two key problems facing tribes (Austin 1993).

Assistance to Tribes

The majority of the tribes participating in this study did not have any established mechanisms for responding to emergencies involving trucks carrying LLRW during the period of the study. In this section, information is provided about resources for establishing emergency response programs.

In 1990, Congress passed the Indian Environmental Regulatory Enhancement Act (PL 101-408) to strengthen tribal governments through building capacity within the tribes in order to identify, plan, develop, and implement environmental programs in a manner that is consistent with tribal culture. The Administration for Native Americans provides funding to support those activities on a government-to-government basis, recognizing tribal sovereignty and tribal culture.

In 1992, in response to concerns about the lack of resources available to tribes, Congress passed the Indian Environmental General Assistance Program Act of 1992. The purpose of the Act is (1) to provide general assistance grants to Indian tribal governments and intertribal consortia to build capacity to administer environmental regulatory programs that may be delegated by the Environmental Protection Agency (EPA) on Indian lands; and (2) to provide technical assistance from the EPA to Indian tribal governments and intertribal consortia in the development of multimedia programs to address environmental issues on Indian lands. Activities that can be funded under the general assistance grant include the preparation and development of an emergency response plan and the establishment of a Tribal Emergency Response Commission. Several of the tribes participating in the study have received general assistance funding.

The Federal Emergency Management Agency's (FEMA) Emergency Management Institute provides training to enhance U.S. emergency management practices related to technical hazards, including hazardous and radiological materials. According to the agency, emergency management includes four phases: (1) mitigation, (2) preparedness, (3) response, and (4) recovery. A significant portion of the training is conducted by State Emergency Management Agencies under Cooperative Agreements with FEMA. Any U.S. resident with substantial involvement in emergency management can participate in FEMA courses, as long as the individual meets the course prerequisites.

The DOE/NV has offered workshops for the public on transportation issues. Their workshops have not been aimed particularly at tribes, but Native Americans have been welcome to participate in them.

Due to the special circumstances of American Indian Tribes, special courses have also been established to train tribal members in emergency response. For example, the National Congress of American Indians' (NCAI) Nuclear Waste Program conducts workshops and training in radiological emergency response procedures and planning for tribal government employees. The NCAI was founded in 1944 "to protect the rights of Indian Nations and Native

Governments, to enhance the quality of life of Indian and Native people, and to promote a better understanding among the general public about Indian and Native governments, people and rights" (National Congress of American Indians 1998). Through a cooperative agreement with the DOE's Office of Civilian Radioactive waste, the NCAI assists the DOE in providing timely information to and accumulating feedback from tribal governments.

Coordinating Emergency Response

As tribes develop their emergency response capabilities, they must clarify how their activities can and will be coordinated with the activities of other regulatory bodies. Under most federal environmental regulatory statutes, primary enforcement responsibility may be delegated to states as well as to tribes. However, states cannot assume primary enforcement responsibilities for federal environmental laws on reservations unless the state has jurisdiction there. Some of the tribes in the study area have agreements with county and state entities regarding emergency response. Nevertheless, many of these are informal arrangements. At times when tribes exert their sovereignty against the wishes of local communities surrounding their tribal land, the communities retaliate by failing to provide services (see Austin 1993). Although they can be broken in times of stressed relationships, formal agreements offer some protection from political maneuvering.

Within the study area, only the tribes along the lower Colorado River have established relationships regarding the coordination of emergency response activities.

Controlling the Trucks Carrying LLRW

Legal Aspects

Many tribal members asked about their tribe's ability to stop the transportation of LLRW across their tribal lands. This section summarizes the major issues regarding LLRW transportation. A more complete legal discussion is included in Appendix J.

Tribes' authority to regulate the transportation of LLRW is significantly limited by the Hazardous Materials Transportation Act of 1994 (PL 103-311; 49 USCS § 5101 et seq.). This Act authorizes the Secretary of Transportation to include radioactive materials under the definition of hazardous material. According to this Act, radioactive materials are defined to include any material having a specific activity (degree of radioactivity) greater than 0.002 microcuries per gram. (A curie is a unit for measuring the rate of disintegration of atoms; one curie equals 37 billion atomic disintegrations in a second.) Therefore, according to the Act, material is radioactive if its atoms experience more than 165, 000 disintegrations in a second. Note that this way of defining radioactive material is different from that established by the DOE (see Chapter Nine).

According to the Code of Federal Regulations (CFR), the transportation of hazardous wastes falls within the authority of the Department of Transportation (DOT). These wastes often

include both radioactive materials and non-radioactive hazardous materials. DOT regulations define radioactive materials as Class 7 Materials (see 49 CFR § 172.403).

Tribes can obtain the DOT's list of designated hazardous material routes. Also, federal statutes give Tribes the authority to regulate the routing of hazardous materials across Reservation lands. Tribes may establish, maintain and enforce designations of highway routes over which hazardous material may and may not be transported by motor vehicle and limitations and requirements related to highway routing. However, Tribes must comply with the provisions of the Commerce Clause of the U.S. Constitution which prohibits any interference in interstate commerce. In addition, Tribes cannot enact restrictions or regulations that conflict with federal requirements or prevent those restrictions from being implemented. In the following areas, Tribal regulations must be essentially the same as the federal requirement: (1) material classification; (2) transport packaging and labeling restrictions; (3) documentation requirements; and (4) notification regarding a release of hazardous material. Tribes can seek a waiver of any rule, and the Secretary of Transportation can allow the Tribe's regulation as long as public safety is equally assured and interstate commerce is not "unreasonably burden(ed)." Tribes must select routes that minimize radiological risk and must consult with affected local jurisdictions, affected States, and Tribes to ensure that all impacts have been considered and that a continuous transportation route is assured.

Tribes may not establish, maintain, or enforce a highway routing designation or limitation until at least two years after the Secretary of Transportation has enacted a routing designation. When a Tribe does seek to establish a highway routing designation, it must comply with standards set by the Secretary of Transportation. The Tribe must consider population densities, types of highways, types and amounts of materials, emergency response capabilities, results of consultation, exposure and other risk, the effects on commerce, and other factors deemed appropriate by the Secretary. However, the Tribe may determine the relative importance of these various factors.

Assistance to Tribes

In 1995, the Intertribal Transportation Association received a Social and Economic Development Strategies (SEDS) grant from the Administration for Native Americans to develop Tribal transportation codes and the organizational structure to enable tribes to exercise control over their transportation systems. The Intertribal Transportation Association offers Tribal Technical Assistance Programs through six area offices. The California office serves California and Nevada. The Colorado office serves Arizona and Utah. A primary purpose of the Association is to advocate for improvements to Indian reservation roads and related transportation services (Intertribal Transportation Association 1997).

Tribal Nuclear Policies

Although tribes have limited authority to control interstate commerce, several tribes have begun working on policies related to the transportation and management of nuclear materials. At the time of this study, only the Fort Mojave Tribe had a written nuclear policy, a Tribal Council

Resolution (Resolution 95-100) declaring the Fort Mojave Indian Reservation a nuclear free zone and prohibiting all nuclear activities within the exterior boundaries of the Reservation. According to a Fort Mojave Tribal Council representative,

> *The Fort Mojave Indian Tribe is opposed to nuclear transportation on and through and around the Fort Mojave Indian Reservation. We believe that there's no safe method for transportation since all existing methods are subject to Murphy's Law. We believe that the method of storing waste that is termed disposal in unlined trenches is not an acceptable method to the Fort Mojave people. We are totally opposed to the transportation of waste [across] the Colorado River and also opposed to the construction of any nuclear waste dumps in and around the vicinity of the Fort Mojave Tribe. (FTM5)*

With the permission of the Fort Mojave Tribal government, the Fort Mojave Tribal Council Resolution has been included in Appendix I, as requested by the tribes participating in this study.

Summary

All tribes participating in the study expressed concern over jurisdiction. The issues surrounding both jurisdiction and responsibility in case of an emergency involving low level radioactive waste (LLRW) transportation are complex and continue to evolve as tribes assume ever greater responsibility for self-government. Neither the DOE/NV nor the tribes can take it for granted that what held in the past will continue to hold in the future. For example, as tribes assert greater control over the lands within their reservation boundaries, their actions are frequently challenged and their authority determined in courts of law.

Jurisdiction over the transportation of across tribal land is governed by the U.S. Constitution, federal and state laws, and right-of-way agreements. The related issues regarding the provision of emergency response on tribal land are governed by federal and state laws and right-of-way agreements. As the routes along which the LLRW will travel are determined, those tribes whose lands are directly in the path of a transportation route or whose members live immediately adjacent to a route must establish, at a minimum, mechanisms for responding to emergencies involving trucks carrying LLRW. Many of the tribes that participated in this study are developing environmental programs, with emergency response procedures as one aspect of those programs. Due to historical failure of the U.S. government to provide tribes with the resources to build their environmental infrastructures, many tribes are only recently beginning to establish their programs. Considerable change is to be expected in the coming years.

CHAPTER SEVEN: RESPONSES TO QUESTIONS RAISED BY STUDY PARTICIPANTS

Diane Austin, Allison Fish

Throughout the American Indian Low Level Radioactive Waste Transportation Study (American Indian Transportation Study), participants raised questions of the researchers. BARA researchers recorded all questions and organized them by topic. The most frequently asked questions are presented in this chapter for the benefit of the participants and others who seek to better understand the issues related to the transportation of low level radioactive waste. The information in this chapter was gathered from official publications of the Department of Energy (DOE 1996, DOE 1990), from DOE employees, from other published sources (League of Women Voters 1993, Nuclear Risk Management for Native Communities (NRMNC) 1996), and from other knowledgeable individuals. Each question is presented and followed by a response.

Low Level Radioactive Waste and Radiation

1. *What is low level radioactive waste (LLRW)?*

Within the DOE, low level radioactive waste (LLRW) is classified by what it is *not* rather than by what it is. According to DOE Order 5820.2A, *Radioactive Waste Management*, low level radioactive waste is any radioactive waste that is not classified as (1) high level radioactive waste, (2) transuranic waste, (3) spent nuclear fuel, or (4) uranium mill tailings. High level radioactive waste is material generated in the production of plutonium and the recovery of enriched uranium from naval reactor fuel; it must be isolated from the environment for thousands of years. Transuranic waste includes anything that becomes contaminated during plutonium processing, such as nuclear weapons production and fuel reprocessing; it must be contained and monitored indefinitely. Spent nuclear fuel includes fuel elements and irradiated targets from nuclear reactors; it is highly radioactive and must be stored in special facilities that shield and cool the fuel. Uranium mill tailings include large volumes of material that result from uranium mining and milling operations; they emit radon, a radioactive substance, and usually also are contaminated with toxic heavy metals.

In addition to any radioactive waste that does not fall into the four categories above, DOE policy allows several other categories of material to be managed as LLRW: (1) small volumes of material used for nuclear research and development; (2) materials contaminated with small concentrations of transuranics; (3) small concentrations of naturally occurring radioactive material; and (4) waste produced in research projects. This "low-level" waste can include a wide variety of forms and radioactivity levels. DOE-generated LLRW generally consists of various types of discarded materials used in the construction and operation of DOE facilities, including articles such as gloves and aprons used for personal protection. Most of the DOE's LLRW has been packaged in drums or boxes and buried in shallow pits and trenches. The vast majority of LLRW already stored at the NTS is contaminated dirt and construction debris.

LLRW is the most common form of radioactive waste being generated by the DOE; it accounts for more than 80 percent of the waste being generated by the agency. Most of the newly generated waste consists of clothing, tools, and equipment used in the cleanup of DOE facilities, dismantled buildings, machinery, and contaminated soils.

Note that the U.S. Department of Transportation has another way of classifying radioactive waste. That method has been described in detail in Chapter Six.

2. *How much radioactivity is in each LLRW package that is transported?*

The amount of radioactivity in each package varies. The radioactivity is an attribute of the radioactive material that is in the package. Radioactive materials are unstable, and the atoms of which they are made split apart until they reach stable forms. The splitting process is called decay. When radioactive materials decay, they emit radiation.

3. *What is radiation? How is it measured? How does it affect me?*

Radiation is energy transferred through space in the form of particles or waves. The type of radiation that comes from radioactive materials is *ionizing radiation*. Ionizing radiation is strong enough to break up atoms or molecules. This energy can be useful, but it can also damage materials and living tissue. The harmful effects of exposure to radiation occur when the radiation energy is absorbed. Some plastics, for example, deteriorate and lose strength when exposed to radiation. The amount of radiation required to cause harm depends on many factors, particularly how large a dose is given to a specific site and how susceptible the material is to damage. A detailed discussion of radiation pathways and mechanisms for causing damage is beyond the scope of this report.

Radiation is measured in two ways: (1) at its source; and (2) where it impacts a substance. Radiation can be measured at its source by monitoring the rate at which the atoms in the radioactive material split apart. The measure that indicates the splitting of 37 billion atoms in one second is a *curie*.

Radiation also can be measured where it impacts a living thing. The energy that can break up atoms or molecules can damage living cells. The measure that is used in this approach is called the rem (roentgen-equivalent-man). Table 7.1 shows the biological effect to humans of various doses of radiation applied to the whole body.

The amount of radiation coming from each package depends on the kind and amount of radioactive material in the package. The Environmental Impact Statement for the NTS assumed that the radiation that would be emitted would be less than 0.05 millirems per hour (1 millirem = 1/1000 of a rem) at a distance of one meter from the surface of the container.

Table 7.1. Biological Effect of Selected Doses of Radiation

Radiation Dose	Biological Effect
0-25 rem	Increased risk of excess tumors, genetic defects
25-50 rem	Increased risk of sterility in men, possible blood changes
50-150 rem	blood changes, increased risk of infection and hemorrhaging
150-400 rem	acute radiation sickness, burns, benign tumors, genetic effects, shorter life span, occasionally fatal
400-600 rem	acute radiation sickness, destruction of bone marrow, half of the people exposed at this level die within thirty days
2000 rem	Immediate death

Source: NRMNC 1996

4. *Do the radioactive materials change while they are in the packages being transported?*

In addition to splitting apart and going through the process of decay, which releases ionizing radiation, radioactive materials give off heat. Because there are small amounts of radioactive atoms in LLRW, the LLRW does not emit enough heat to make the waste hot to the touch.

Radioactive materials react with other materials, both radioactive and nonradioactive, through the radiation they emit. The radiation can cause damage and deterioration in the affected materials, and it can cause delayed effects in living tissues. The energy that is given off during radioactive decay can produce new radioactive substances by changing the atomic particles that make up the radioactive waste. The effects are in addition to chemical reactions that may occur between materials, whether they are radioactive or not.

5. *What happens when LLRW comes into contact with air, water, soil, plants, and animals?*

Radioactive materials can contaminate the air, water, soils, and other things they come in contact with, by being scattered or spread around and/or by sticking to or being carried by other materials. These radioactive materials continue to decay and produce radiation, wherever they are. They react with those materials, living and nonliving, as described in numbers 3 and 4 above.

6. *Is radioactivity cumulative?*

Radioactivity, and the radiation that comes from radioactive materials, is cumulative in the sense that the total quantity is the sum of the individual amounts present. However, radioactivity in LLRW does not multiply - it cannot behave like a critical mass as would the materials of a reactor or a bomb.

Transportation Issues

7. *Who is responsible for the transportation of LLRW? How are the carriers chosen? What training must a driver receive?*

The transportation of LLRW is the responsibility of the carrier, whether that carrier is a public or private entity. The Department of Transportation is responsible for setting the regulations for the carrier, and the carrier must comply with the Federal Motor Carrier Safety Regulations (40 CFR 350-399). A qualified carrier must prove that its trucks are maintained according to regulation and that the drivers who will be transporting the waste are certified.

The generator of LLRW is responsible for its proper packaging and for selecting a responsible carrier. For DOE-generated LLRW, qualified carriers bid for contracts with the DOE. These contracts specify the origin, destination, and amount of the waste and the period of time in which the waste is to be transported. Those companies capable of transportation under the Department of Transportation regulations are eligible to become qualified to bid for DOE contracts.

Among other requirements, a qualified carrier must have specially trained drivers. Driver training includes how to conduct pre-trip safety inspections, the use of vehicle controls and equipment in dangerous condition, procedures for loading and unloading materials, how to secure the load, and information about the properties of hazardous materials. A driver carrying LLRW must have his or her certification immediately available and recognizable to authorities.

During the transportation of LLRW, the driver and carrier are responsible for the waste. The carrier must hold an insurance policy that would provide compensation up to approximately $2 million for damages in the case of any accident. Proof of this insurance must be given before a carrier is eligible to bid for contracts that include the transportation of LLRW. For Department of Energy contractor's the liability is slightly different. Under the 1988 Price Anderson Act, the Department of Energy's contractors' activities are insured for the same amount as the total liability of the nuclear utility industry. This amount is adjusted for inflation at least every five years and in 1993 was over $7 billion.(League of Women Voters 1993)

The Department of Transportation and state/tribal transportation, emergency response, and environmental agencies have the right and responsibility to regulate the transportation of LLRW and periodically inspect all aspects of such transport to ensure compliance with relevant federal regulations (see Chapter Six).

8. *What are the responsibilities of the DOE?*

The DOE and its contractors who operate DOE facilities share the responsibility to make sure that the LLRW has been identified, classified, packaged, and labeled in accordance with all relevant federal, state, and local regulations to ensure safe pick-up, transport, drop-off, and storage of all LLRW shipments. Additionally, the DOE has the responsibility to (1) identify and select carriers that meet all applicable federal, state, and local regulations, (2) actively track all

LLRW shipments coming from or heading to DOE facilities, (3) assist in emergency response tasks if requested, and (4) actively monitor and care for any LLRW stored on DOE facilities.

9. *Is anyone notified when LLRW is being transported? Must the trucks pass through check points?*

According to Department of Transportation regulations, the carrier is responsible for notifying the state of shipments of LLRW. Each state determines who must be notified . The permit to transport LLRW in Nevada requires a four hour notification via telephone to the Nevada Highway Patrol Communications Center. Generators input information about LLRW shipments into an electronic tracking system known as DOE HAZTRAK. Once the shipments are received at the NTS, the information is deleted.

Trucks can be stopped by a state or tribe by competent authority, the State or Tribal Highway Patrol, and must stop at all inspection stations along the route that are open. Check points are established wherever the states and tribes want them to be located. Specific requirements on stops are given in *49 Code of Federal Regulations 392.9.*

10. *In case of an accident or spill, who is responsible for cleanup and for handling traffic?*

The Department of Transportation requires that carriers maintain insurance to pay for all cleanup, if needed. In the event of a spill, the carrier would contract with a legitimate cleanup company. DOE would respond only if requested by the State in which the spill occurs. With DOE-generated LLRW, a spill would usually mean dropping solid material, which is relatively easy to recover. Nevertheless, fluids may occasionally be involved.

An accident involving LLRW occurred in Missouri approximately three years ago. In that case, the outer container did not break, so the cleanup involved picking up the container and returning it to the generator for inspection. When federal facilities have required cleanup, they have used DOE Radiological Assistance Teams. These teams provide radiological assistance to federal, state, tribal, and major Nuclear Regulatory Commission licensees in the event of an incident involving radioactive materials. Radiological Assistance Teams are at all DOE offices, at all National laboratories, and most area offices and associated contractors.

In case of an accident, traffic is handled by local jurisdictions. DOE will respond only if requested to by the authorized State, Tribal and/or local organizations.

11. *Where else can trucks stop? What happens when a truck has a flat tire or breakdown?*

A truck may stop and pull off the designated route if there is an emergency. If this emergency relates to the condition and the safety of the truck and its cargo, the driver is responsible for repairing the vehicle as quickly as possible and then continuing on to the final destination. If the truck cannot be repaired in a timely manner, then the carrier is responsible for finding a way to transport the LLRW safely and quickly to the pre-arranged final destination or to the nearest storage facility. Drivers are allowed (and required) to stop for rest, food, and gas.

12. How are tribes, towns, and communities prepared for having LLRW shipped through their jurisdictions?

In Nevada, DOE has provided training to first responders, those who are likely to be the first ones at the scene of an accident. DOE also has provided refresher training to emergency response personnel, such as firefighters, police, and medical staff. Training is also available from other sources (see Chapter Six).

13. How were the three proposed routes discussed in this study chosen?

The three routes discussed in this study are among the *preferred* routes that the Department of Transportation requires be identified for the transportation of LLRW. The preferred route, unless otherwise determined, is the Interstate highway system. A State or Tribe can designate an alternate route within its borders if it meets the criteria for minimizing radiological risk. When hazardous materials, including LLRW, are to be transported, the carrier must provide the driver with a copy of the written route plan that includes (1) the origin of the waste, (2) the destination of the waste, (3) preferred routes, (4) planned stops, (5) departure and arrival times, and (6) telephone numbers to access emergency assistance in each state along the route. The driver must select among the preferred routes to minimize travel time and increase safety. For instance, if the weather were to make a stretch of interstate impassable, the driver must take an alternate route. When an interstate passes through cities, an interstate bypass shall be used, if possible. Situations like the Spaghetti Bowl in Las Vegas and Salt Lake City should be avoided when possible. Specific regulations covering route selection are found in *40 Code of Federal Regulations 397.*

A vehicle carrying LLRW may leave a preferred route under certain circumstances, when continued use of the preferred route would be unsafe or impossible. Examples of such circumstances include (1) pick up and delivery of the waste, (2) obtaining rest, fuel, or repairs, and (3) emergencies.

Because of the scarcity of usable routes in southern Nevada, all preferred routes were considered in this study. Although this study focused on the highways near the NTS, all interstate highways are available for use in the transportation of LLRW. Therefore, LLRW may be transported down I-15, I-40, I-10 or any of the other highways leading to the routes identified for this study. The national ground transportation routes, from the point of generation of the LLRW to the NTS, are described in the NTS EIS Volume 1, Appendix I, "Transportation Study."

14. When is the transportation of LLRW going to stop?

The transportation of LLRW to the NTS will be significantly reduced once cleanup of the DOE sites is completed. Estimated dates by which cleanup will occur have been suggested to be as early as 2006, if the DOE's Accelerated Cleanup occurs as planned, and as late as the end of the next century, if predictions made in the *Baseline Environmental Management Report* are accurate (Office of Environmental Management 1997). After cleanup is complete, a small

amount of LLRW will continue to be produced in the regular activities taking place at DOE facilities.

15. Why is the DOE not considering other options, such as flying the waste in?

The DOE does not use aircraft because it is too expensive. Airlines do accept and transport radioactive material aboard passenger and cargo aircraft (49 CFR 174.204 and 175).

The DOE is presently considering the use of a combination of railroad and highway to transport LLRW to the NTS (see Chapter Five). Using more than one method of transportation is called intermodal transportation and has been suggested as part of the DOE's accelerated cleanup program.

Information About the Nevada Test Site

The Nevada Test Site (NTS) is one of twenty major operating facilities in the U.S. Nuclear Weapons Complex (see Figure 7.1). It is the nation's only facility for testing nuclear weapons. Located 65 miles northwest of Las Vegas, the 1,350-square-mile site, bordered on three sides by the Nellis Air Force Range, is a secure facility withdrawn from public access. It was established as a U.S. proving ground in 1950 because of the expense and logistical problems associated with testing nuclear weapons at the Bikini and Enewetak Atolls in the Pacific Ocean, where nuclear testing was being conducted. Since the U.S. entered a testing moratorium in 1992, the site has remained in readiness in case nuclear testing were to again recur.

In 1961, the DOE/NV began using the NTS for the disposal of the LLRW generated by the DOE/NV weapons testing program. Since 1978, LLRW disposal at the NTS has expanded to include waste generated at other DOE sites and approved facilities throughout the U.S. LLRW is disposed of in shallow trenches at the Radioactive Waste Management Sites in Area 3 and Area 5 at the NTS (see Appendix D). These two areas have deep water tables, extending to depths of 1,600 and 770 feet, respectively. They are considered by the DOE to be ideal for LLRW disposal because of their arid environment and their remote locations (DOE 1998).

Area 3 is a 120 acre site, and waste is disposed there in subsidence craters formed by the underground detonations of nuclear weapons. Waste arrives at the site in different types of containers. The majority of the waste disposed in Area 3 is generated by environmental restoration activities throughout the DOE complex (see Figure 7.1). The craters are deep enough that the layers of waste are separated by a one to three foot layer of clean fill soil (DOE 1998).

Area 5 is a 740 acre site, 92 acres of which are currently used for LLRW disposal. The site was established at the NTS for the disposal of LLRW and classified low-level waste. The waste arrives at the site in a variety of containers, such as drums, boxes, and "supersacks." Trucks delivering the waste are checked when they arrive and when they leave to ensure that the radioactivity remains within the containers. The LLRW is deposited in shallow, excavated disposal cells, about 22 feet deep. The containers are stacked and arranged in a grid system so

they can be tracked and retrieved, if necessary. As each cell is filled, an eight foot layer of soil is spread over the waste. Area 5 is also used for the temporary storage of other types of waste, including transuranic and mixed waste (see question 1). No off-site mixed waste is currently being accepted for disposal in Area 5.

Other DOE facilities at which LLRW is disposed include the Hanford Site in Washington, the Savannah River Site in South Carolina, the Oak Ridge Reservation in Tennessee, Los Alamos National Laboratory in New Mexico, and the Idaho National Engineering Laboratory. Unique wastes, such as the hull sections of decommissioned submarines, have been shipped to Hanford and the NTS for disposal (DOE 1996).

Information About Yucca Mountain

Yucca Mountain, located in the Mojave Desert of southeastern Nevada about 100 miles northwest of Las Vegas, is the geographic site chosen as the permanent storage site of the nation's high level radioactive waste (HLRW). Yucca Mountain has been under consideration for HLRW storage since 1987 (Department of Energy nd). The selection of the site has been the source of considerable controversy. For example, charges against the site claim that it does not meet EPA requirements due to earthquake activity and the possible impacts to groundwater if an earthquake were to occur (University of Colorado 1997). The DOE plans to carve out 100 miles of tunnels for the HLRW storage areas, to be located one thousand feet below the earth's surface. At that location, this is 800 feet above the local groundwater levels. In the event of an earthquake registering 6.0 or greater, there is the possibility that groundwater may be pushed into the storage areas. According to the current schedule, Yucca Mountain may begin receiving shipments of waste in the year 2010 and would go on doing so for another 100 years. When the site has reached maximum capacity, 70,000 metric tons, it would be closed until the radioactive materials had decayed to the point of "safety." Scientists believe that this will occur in approximately 10,000 years, though some studies concerning Yucca Mountain focus on predicting climate conditions as many as 100,000 years into the future (D'Ambra, Carter, and Strand 1995).

Related Issues

16. How secure are the containers used during transport?

The containers used to transport LLRW are designed to be easily handled and secured during transport. Two type of packages, the designs for the containers of the wastes, are used in the transportation of LLRW. Both types of packages must be "capable of withstanding the effects of travel." These effects include a minimum impact resistance of up to 60 miles per hour and being able to withstand fires of up to 1,475 degrees Farenheit for thirty minutes. Both types of packages undergo tests that require that a model of the container of approximately one quarter of the intended size be tested for impact and fire resistance. The package is also tested for leaks of radiation up to and within five meters of the package. In order to ensure that the design of the package will be able to withstand the above conditions a scale or computer model of the

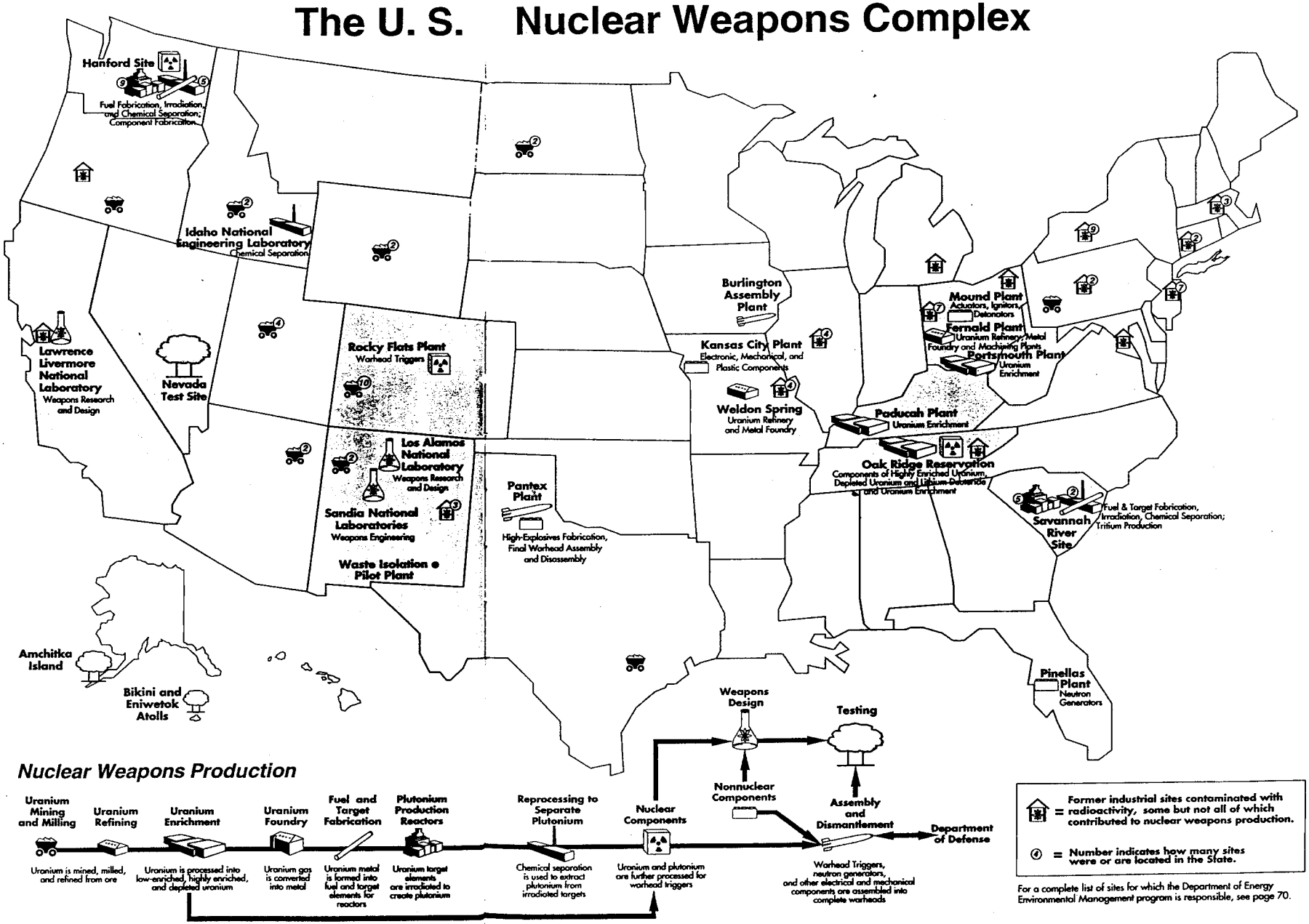


Figure 7.1 The U.S. Nuclear Complex.
Source: *Closing the Circle on the Splitting of the Atom* (DOE 1996)

container is subjected to a controlled set of accidents. These situations are intended to simulate the heat and "crushing force" that would be present in a transportation accident (Saleska 1989).

17. Who is using the energy that is generated by nuclear power?

Users of electricity from commercial nuclear reactors include a wide range of private and public organizations. From individual private citizens to large manufacturing corporations to federal agencies, electricity generated by nuclear reactors supplies users across the continental U.S. Much electricity is distributed from a grid, where electricity from multiple sources is introduced into and sold from the grid. Under this system, it may be difficult for users to find out the source of their electricity.

CHAPTER EIGHT: AMERICAN INDIAN PERCEPTIONS OF RADIATION

Richard Stoffle

This chapter is about the cultural foundations of American Indian thinking about radiation. The analysis is based on the understanding that cultures have deep abstract foundations or *beliefs* on which are based less abstract statements of good versus bad, desirable versus undesirable which are called *values*. Beliefs can be understood from an analysis of values, but they can be studied more directly by talking with people who think about or study the foundations of their own culture. Such a study is about epistemology or theories of knowledge.

In this case, we are particularly interested in the epistemological foundations that explain radiation and its potential impacts on American Indian people and their natural resources. In order to explain this study and its findings to non-Indian people, it is necessary for them to realize that we are considering a different cultural system from that normally represented in western science.

American Indian thinking about the world, including radiation, begins with a basic premise that all the world is alive. Not only is all the world alive, but all living things have characteristics much like humans. All living things speak and hear, have power which they will share or withhold, depending on their desire. All living things consume energy or share energy, and all living things have personalities which enable them to be satisfied or dissatified, happy or angry, friend or foe.

Methodology

This task involved conducting in-depth interviews with selected tribal members from among the tribes associated the study. These people were selected in consultation with their tribal governments and with the assistance of the American Indian Transportation Committee members. The purpose of the interviews was to gain a more comprehensive understanding of various aspects of Indian culture and the transportation of LLRW. The issues discussed derived from the Phase One interviews.

In January of 1998 the Phase Two interviews with cultural experts began with a letter to all members of the AITC. This letter requested that they provide a few names of people to be interviewed for Phase Two of the study. The letter indicated that the interviews would last from a few hours to all day with each person, as appropriate and desired by the person. The people to be interviewed should be chosen because they are recognized by fellow Indian people as thinking deeply about radioactivity and its potential impacts on plants, animals, water, air, and people. The letter further stated that hundreds of Indian people had already been interviewed in Phase One of the project, and so hopefully the Phase Two interviews would more fully explain the

cause and effect relationships between radioactivity and Native American perceptions of the environment.

Over the next few weeks the members of the AITC worked closely with tribal governments to select people who were interested and qualified according to the tribe to talk in depth about these issues. Interviews began in early February with people from tribes in northern Nevada and continued until the last interviewed were conducted with people from tribes in southern California. The interviews went as expected lasting up to a half day and involving Indian people with clearly developed opinions regarding the nature of radioactivity and Indian culture. Whenever possible, either the Indian members of AITC or the BARA ethnographer met with local tribal government officials to provide them with updates on the progress of the study.

Analyzing Text from Interviews with Cultural Experts

The Phase Two interviews with recommended cultural experts were designed to provide holistic statements about issues raised in Phase One. To accomplish this, each interview was taped with the permission of the person being interviewed and with the understanding that the respondent would review any portion of the interview that might be used in the report. The tapes were then transcribed and edited to fit into this report. Those portions that were used have been reviewed by the person who was interviewed.

While direct transcriptions of people's ideas about these issues is very valuable for understanding how they establish their opinions, it is also useful to contextualize these statements. Thus ethnographic comparisons were utilized to contextualize these statements. Some of these comparisons are available from previously conducted interviews while others derived from the published ethnographic literature.

Although there have been a number of projects in the region involving radioactivity, to our knowledge there have been only two studies of the potential impacts of project-related radioactivity on American Indian people (Cultural Systems Research 1987; Stoffle, Evans, and Jensen 1987; Stoffle, Evans, and Harshbarger 1989). These studies assessed the potential impacts of t he proposed California low-level radioactive waste disposal facility on American Indian people in the Mojave Desert, and the potential impacts of siting the high-level nuclear waste storage facility at Yucca Mountain, Nevada, respectively. Eight of the sixteen tribes who participated in the California study also participated in the Yucca Mountain study. The Yucca Mountain study built upon previous insights and contributed toward a more complete assessment of a traditional American Indian interpretation of radioactivity.

American Indian Knowledge, World View and Radioactivity

Ethnographic studies of human societies document that people who live in a region over long periods of time come to understand, explain, and deal with most of the natural components of their environment. Such knowledge is termed local knowledge or emic perspectives of the

environment. The American Indian people involved in this study certainly qualify as having local knowledge inasmuch as they have lived in the region for more than a thousand years. What is not as certain is whether radioactivity or any of the many radioactive minerals would have been recognized as a natural element.

Previous Studies

This section briefly describes findings from two previous studies on the perceived impact of radioactive waste storage on cultural resources by American Indian people. It was during these studies that an initial American Indian perspective on radioactivity began to emerge during interviews.

The California LLRW Siting Project and Radioactivity

During the State of California low-level radioactive waste facility siting project, Indian people were asked whether radioactivity existed before it became widely known and used as a man-made element in the 1940s. Responses varied widely. Many people said the concept of radioactivity was not taught in schools when they were children so they were not aware of it. These people either misunderstood the question or were reluctant to discuss a sensitive issue relating to traditional beliefs. Others, generally persons the researchers had known for years, began to consider the issue and to provide partial interpretation. One Chemehuevi Paiute elder, for example, discussed places where the old people told him never to spend the night. These were places of great power that could make one sick if they remained there. He also told ethnographers about powerful rocks that could cure or harm and were used only by religious leaders. If these rocks were broken, they could release their power and potentially harm people. Consequently, it was always better not to break a rock unless the extent of its power was understood.

Other Indian people confirmed these ideas about rocks having power. It is recognized that some rocks have more or different power than others. Breaking a rock or removing it from its place without fully explaining these actions not only releases the power inherent in the rock, but also angers the rock.

Rocks can also be self-willing, inasmuch as they can reveal themselves to people and act on people. Crystals, for example, have a self-willing, animate power and will reveal themselves to a person whom they desire to be with. If this person picks them up, the person will have great luck. That luck, however, is taken away from others and eventually people will come to recognize this fact and single out the excessively lucky person as having used some non-human power at the expense of his or her people. Threats of community sanctions usually make the person take the crystal back to where it had revealed itself and return it with an explanation of why it was being returned. The ethnographic literature also discusses the power of crystals for Great Basin and surrounding Native American groups (Levi 1978; Miller 1983).

The power of rocks, including uranium ore, was discussed during the California low-level radioactive waste disposal siting project . Again, the power of rocks was said to be used for both

good and evil. During this study, a particular plant was said by Paiute representatives to be associated with the presence of uranium. Excerpts from these interviews are presented below.

Mohave elder (Calnuc tape #5):
There are certain rocks, Mohaves are dead against to have in your pocket. White rock. Like an ivory rock. It's good for evil and bad. Most of the guys that carry it around in their pocket are the ones that have a good time, and all of a sudden they get into evil parts, we're not supposed to have in our possession. It attracts attention, different things that you would want to have possession of. Not good for you to carry, 'cause you don't know what you're doing, so I think that it's the same thing with this [radioactivity].

Mohave elder (Calnuc tape #1):
"Indian people are always against putting things in the ground that hurt it." This Mohave woman's interpretation was that radiation is unnatural. She felt that when you put it into the ground, you hurt the ground. *"You hurt Mother Earth the way that you put poisons.* " Poisons were perceived to be unnatural.

(Calnuc tape #14) One Kaibab Paiute elder said that uranium could be used in dreams for evil purposes, particularly to cause someone else's illness or death. It could also be used for good purposes, but was unable to specify what kind. Power from this kind of source was easier to use than to get rid of. Fear of this power being used for evil purposes was perhaps what made [Mojave elders] afraid of the dump site.

(Calnuc tape #26) A Pahrump Paiute representative noted that a traditional Indian food plant, known as Prince's plume or Indian spinach (*Stanleya pinnata*; Paiute *tumar*) is also a sign of the presence of uranium, especially when the plant is found growing in abundance.

The Yucca Mountain Project and Radioactivity: The Angry Rock?

Indian people have responded strongly to the concept of radioactivity being near traditional plants, animals, artifacts, and places of occupation. Why they have responded in this manner is not as well understood as why they respond as they do to other types of projects like power transmission lines and natural resource exploitation. The latter response is better understood because they have responded to dozens of cultural resource impact assessments over the past three decades.

During the key cultural expert interviews for the Yucca Mountain cultural resource assessment, various people were asked specific questions about a traditional perception of radiation and general questions about rocks and their power. While knowledge of this issue and full understanding of the questions appeared to vary, as it had in the California study, the issue of trust seemed to dominate the responses. The researchers, for example, had not worked closely with the Owens Valley Paiutes and Western Shoshone people, thus few interviews delved into basic philosophy. In contrast, Southern Paiute people were more at ease with the researchers and discussed the issue openly.

The following is edited text from a Kaibab Paiute elders meeting held on the Kaibab Paiute reservation. The meeting was conducted as part of the initial interviews with tribal elders regarding the disposal of radioactive waste at Yucca Mountain, Nevada. This text represents one of our first interpretations of radiation in a traditional context. Eleven people, mostly elders who knew each other well and had worked with the ethnographers for more than a decade, attended the three-hour meeting.

Ethnographer:
Did the old people ever worry about those rocks? I mean, those rocks have been around. Were there ever places where the old people said you couldn't go because the rocks would cause harm? Is it possible that the old people actually knew about radioactivity and the harm in the rocks?

Indian Woman #1:
Not that I know of, I don't think they knew 'cause they never went to school or studied anything like that.

Indian Woman #2:
(She speaks in Paiute for a few minutes discussing the question.)

Indian Woman #1:
Maybe that's what it meant. We didn't understand them. We didn't listen to our older elderly people too much, 'cause as she (indicating the other elder) says that in the old days, you know, old Indian people used to say that even rocks are harmful. They are cruel.

Indian Woman #2:
Maybe that's what it meant.

Indian Woman #1:
They were probably trying to tell us, and we didn't understand. We didn't pay attention to them that much. But the only thing that I really paid attention to is my grandfather telling me even the lakes and the rivers, the Colorado River especially, at times it gets mean. It'll take a life. They'll run around there and holler and go wade around in there, it will get angry with you, it'll take you. (She tells a story of a little boy who drowned; it validated the belief for her.)

Indian Woman #3:
The elders told me they also believe...rivers are supposed to be flowing freely, but what does man do today? They dam them up, so, therefore, those lakes and dams that are man-made are no longer safe because they've been forced to stand like that and don't belong there. The water doesn't flow freely like they're supposed to. That's why you see places like Quail Creek [a recent reservoir in Utah], it takes people.

Indian Woman #2:
Even the mountains. (She tells a story of a woman who got lost; it validated the belief for her.)

Ethnographer:
If you dam the water and the water is no longer free to do what it naturally does and it becomes angry, and you mine the rock and turn the rock into something else, is there a connection? Is it similar? Is it like changing the rock from what it was and making it angry? Does this [interpretation] make any sense?

Indian Woman #3:
The rock is being used for destructive purposes. What happened, they're using it for power, right? Then, what have we got after that? Waste! And what happens when it becomes waste? OK, so you are going to bury it. Nobody has any guarantees that that waste is not going to be harmful, that it's not going to come out of its containers, that it's not going to affect the watershed, that it's not going to contaminate the tribes that are downstream from where it is.

Ethnographer:
The water has a will of its own. (pause) Will the rock? (pause) Is it possible? (long pause)

Indian Woman #1:
(Nonverbally indicating yes) *In the mountains it is the same way. They can take people.*

In another interview conducted in a private home, a Paiute elder from Utah discussed radioactivity in terms of a yellow rock that was only used by warriors who put it on their faces just before going into battle. The rock was extremely strong, but could be used under the right circumstances. It had to be collected carefully with the person explaining the purpose of the collection and especially why it would be ground up for use. Otherwise the rock would not only withhold its positive power, but could cause physical harm to the warrior or religious leader. The Paiute elder conveying these interpretations believed that the negative components of radioactivity derived from the rock having become angry by the way it was mined and the purposes to which it was being put.

Placating the Angry Rock

The self-willing life force in rocks can be "talked to." Crystals can be picked up or left alone or returned to their place in the desert without danger of them becoming angry if the action is explained. Other rocks can be talked to and asked for their power to be used to help a person. While the proper treatment and return to their original location in the desert is sufficient to satisfy crystals, some of the special helping rocks must be thanked with gifts.

Curing rocks, for example, have special curing powers, but these rocks must be approached, touched, and thanked so they will provide cures and not harm the person requesting their power. There are two such rocks, one Southern Paiute and one Western Shoshone, that are used by the Indian people involved with this study.

The Southern Paiute rock is located on an isolated mountainside in Utah. The rock has a flat surface that will accomodate a prone person. In profile, the rock has a shape that has been interpreted as being like an eagle's head. The eye is a four-inch diameter hole that extends for

more than twelve inches into the rock. When a person approaches the mountainside, prayers are said to communicate to the rock why the person is present. Unless the prayers are appropriately said and in the Indian language, the rock will not reveal itself. When the sick person sees the rock, a gift is presented. Most gifts are round stones that have been selected while the sick person was coming to the site. Both large and small stones are used as gifts. The stone is placed in the eye of the curing rock, but first the person must remove the stone left by the previous sick person. These past gifts to the rock are placed carefully downslope from the rock, small stones on one side, large stones on the other, forming a visual record of the times people have visited the curing rock. With his or her stone in the eye of the curing rock, the person says prayers that describe the illness and then lies down on the rock. A person may go to the rock with an Indian doctor who helps with the access and curative prayers. When the curing period is over, the sick person leaves.

The issue of curing rocks was raised while Indian people were interpreting a "possible" curing rock located at a petroglyph panel site on the Nevada Test Site. According to a Western Shoshone elder, a commonly used curing rock is located in west-central Nevada. This rock has been "designated" by Indian religious leaders as a medicine rock; that is, it has been sung over by a medicine man, after which the rock became sacred and could cure sick people. In order to tap into the curing power of the rock, a sick person must first pray over the rock and then lie down on it. After the curing period, the person leaves money on the rock or around it in the soil. Other people never remove this money because they recognize the money as an offering to the curing rock. Any person can go to this curing rock and do his own blessing, or he can be accompanied by a traditional leader.

The ethnographic data on the power of crystals and curing rocks, Indian peoples' interactions with these rocks, and the traditional interpretation of radioactivity may help in understanding Indian people's concerns regarding radioactive waste. First, rocks have spiritual depth; there is a self-willing life-force in rocks. If so, radioactivity may be harmful to humans because a spiritually powerful rock (uranium) is treated in ways that the rock defines as inappropriate. Because of this inappropriate treatment, the rock is angry. Can containers that are designed to hold high-level radioactive waste, which is a by-product of science, constrain the spirit of an angry rock? Second, Indian people have always talked with spiritually powerful rocks. Indian people make requests of, explain human situations to, and give thanks to their powerful rocks. Could the spirit of the angry rock be talked with in the effort to reduce its anger and, thus, the danger perceived to be associated with it?

Cultural Expert Perceptions of Radioactivity in the NTS Transportation Study (Phase 2), 1998

During the Phase 2 interviews, cultural experts from several Indian ethnic groups were contacted regarding their perceptions of radioactivity. The ethnic groups and tribes represented are the Western Shoshone (Yomba, Ely, Elko), Goshute (Deep Creek), Mohave (Colorado River Indian Tribes), and Chemehuevi Paiute (Colorado River Indian Tribes, Chemehuevi Indian Tribe).

Traditional Land Ethics and Radiation

The NTS Transportation Study Phase 2 interviews further demonstrate that the American Indian "traditional view" of radioactivity is more accurately understood in the context of traditional views, land ethics and beliefs regarding the treatment of natural resources in sacred cultural landscapes. That is, all resources have inherent life-forces and power. Resources must be petitioned through talking, prayer, singing and ceremony in order for the resource to benefit and serve the people. Inappropriate mistreatment of a resource serves to hurt and anger it, thus it may refuse to provide service or cause harm to individuals and larger groups of people.

A Western Shoshone cultural expert provided the context in which concerns about radioactivity are embedded. This context encompasses the interdependence of people and natural resources in a given landscape:

... the plant and animal life on the face of the Earth, they were put here with us for us to use, so it is ... I would like to put it this way; the deer have said to us at one time "I am here for you if you take care of me, then I will take care of you. But before you take my life, make sure you tell me why you are taking my life. When you do take my life, make sure you use every bit of it, don't throw part of me away. I am here so make sure I can continue. Make sure what you do is good for yourself and for me. We are put here in the Nature, together here, to survive." Those are the reasons why today, not only the animal life has said these things, all the plant life says the same thing, they all say the same thing. "We are here with you, you have to work with us, we will work with you."

So all of the medicine, for instance, that we as a native people have used for many, many years, say the same thing to us. "Before you dig, before you do anything with me, before you take my life or the berries off of me, make sure you tell me so that I can continue my life, so that it is not ended there. If you do not tell me, then I might die off." So this is where we as a native people come in and say this is very important to us. To gather our berries, for one. When we do gather our berries, we have to have ceremonies and make sure that we tell the plant life where we are coming from. Why we are going to pick the berries off of them. But we don't pick at any time, it comes in with the season, what month it is, and how the moon sits, and all of that. Have to be conservative...so the Nature can replenish the plant life, it works with the moon, with how the water raises. And those are the things that we have forgotten and that I think we are coming back to this. All the living things have said that to us. This is something that we, as a native people, have been told, generation after generation...

All animals, our plant life, our medicine. Before we harvest our medicine, take it out of the ground, we have to tell it why we are taking its life and what we are going to use it for, and so on and so forth. And we always leave some of it there. Our Earth said the same thing, the water said the same thing. The water said "If you take care of me, then I will take care of you. But if you ask me to clean you I can clean you, but you have to ask. You can't just go out there and do whatever you want because they have lives like we do. They have spirits and all of that. We all understand, those things, they used to talk a long time ago...and still today they have a voice. Not all of us can hear those things, or can continue to talk to it or sing to it, and so forth. When

we do sing to it, we sing to it about them, about connecting ourselves to it. We are singing about them and making ourselves pure. And everything has to work. The nature has to work with us and we have to work with the Nature. All this food that we have to survive on, or eat ,or however you want to put it. Certain seasons they are ready for us and they say "I am here and I am ready". The best way to explain this I think would be pinenuts. Pinenuts, when the rabbit brush turns yellow throughout the country, that is when the pinenuts will tell you, they will say "I am ready, I am ready for you to harvest me. But make sure you have your celebrations, make sure you have your body clean and make sure you tell me when you take me, so that way I can have the strength to be ready for you." So when we do those things, those are the reasons why we do our ceremonies. We do them to gather our food, whatever kind of food it is.

Ceremony is very important, singing to them is very important. We have got to make them happy, so they can work with us. We all understand that singing and talking to them is very important part. It is like us getting together and singing together, whatever we do. Ceremony is a very important part that we as a native people play in all of this because it helps the nature to work. The nature has told us this is what you have to do.

And today when we haven't been doing it, it starts to dry up. When it dries up pretty soon we are not going to be able to have anything because this is what the plant life has said, the animal life, "If you don't work with me, if you don't tell me, then little by little, I am going to disappear. Because you don't appreciate me and you are not even worth it." Those are the reasons why our food is disappearing today, not only that it is killing us and not only us but all the chemical things we are putting out, radiation for one, shouldn't be used the way it is. Radiation was here to begin with, and we used radiation long, long ago, but when radiation is mixed with something else it became more dangerous, we should never monkey with it until we say from the beginning we should say we should be the ones to be held accountable. Just like the spring in the mountains, where the water comes from, with the BLM, they monkey with those things and three years later it dries up... I don't care how much it really is, they were the wrong persons to monkey with it, they are not connected to the spirit of that springs and those are the reasons why Nature chose us. Just like breaking a leaf or, a branch off the tree ... when a white man breaks it the tree dies, but when a Indian breaks it, he strengthens it, makes it more better because he is connected with it. All of those things, works with the Nature, we have to work with the Nature in order for us to...to tell us the reason why we are taking their lives...this is the reasons why we are singing songs.

The cultural expert continued to discuss the impacts of radiation on Indian landscapes and resources:

Whatever we used at one time has begun to disappear because we, as a people, have began to develop something that is dangerous, nuclear weapons for one. We talk about nuclear, where it comes from, and so on. And this is something that we are going to have to really realize, this nuclear power that we talk about, this man made thing. Radiation there, all right, but when you mix it up with something else it becomes more dangerous. And today those are the reasons why everything began to be sickly today, we are killing their spirit and their spirits have begun to disappear and they began to die. And today throughout the world our medicine is not here,

dying, a little at a time, and we don't realize it. And today we don't realize our water isn't there. We don't have clean water anymore, the spirit in that water is dying, so we see that throughout the country...

The Mother Earth needs water, it comes from within, but it still must have clean water to purify itself. So far the rocks throughout the country today have begun to be softer, they aren't hard anymore, from all the trash out there, all the radiation and what not. That is not the way it should be. And today all the radiation out there has begun to show us, it means to tell us that someday we are not going to be living through it, we already began to disappear. There is already a lot of sickness going on because of radiation...today, nuclear power is just killing all living things, not just humans, but all things are getting the sickness. It all comes from radiation, it is a man-made thing that has become dangerous, we already see that...today our food is beginning to get radiated with all kinds of chemicals, and radiation is so into everything now that we are not going to be able to survive for very long. The only way we are going to survive is to make sure it is not going to harm us.

The cultural expert then discussed the potential role of traditional practices in alleviating the impacts of radiation on environmental resources:

We are the only ones who can talk to these things. If we do not make sure that we talk to those things, then they are going to give us more bad harm, because it is already happening throughout the country. Those are the reasons why the Indian people say...like uranium for one, uranium was here since the beginning of this Earth, when it was here we knew uranium at one time. And still it is used, but then they got a hold of it and made something else out of it. Now it is a man made thing, and today it accumulates waste from nuclear power plants, it accumulates more, it has its own life. Radiation has said to us at one time "If you use me make sure you tell me before you use me why you are going to use me and what for." And we never said anything to that uranium at all, and we put something else in there with it, which shouldn't belong with it. It gives it more power to eliminate the life, of all living things on this planet of ours. Those are the reasons, why the Indian people always say, and I know because I have been there. The rocks have a voice...

Songs...we are the ones who should be talking to those things. Radiation is going to take all of our lives, it is continuously moving over the land. The land don't want it, nobody wants it. And today, we are doing a bad thing by using radiation on each other. Radiation is something that should not be used to kill animal life...

We should be doing ceremonies to try and get our earth, water, our air and so forth...all the living things rely on today, we are the people with the voice, we are the people who can speak to them and tell them how to live their life. This is why the native people have always said you have to give to receive. I don't care how we look at things, every time we take a life we have to...plant life, bird life, animal life, you have to give in order to receive. This is where we are at today and we are not even giving anything, all we are doing is taking what we can, but that is not the way it should be, we should be talking to them...why we want to take their life, why we want to pick berries off that plant, just like it was said to us "If you tell me why you are going to take my life

before you take my life, if you take my life without telling me then I will not come back"... as a native people...we have used rocks for many, many years, for many millions of years. And when we work with the rocks, it continues to go on, it has a strength of its own. And those are the reasons why we say don't bother the rocks. The rocks have life like we do, it thinks like we do, and drinks water like we do, it eats food like we do, it breathes air. We have to start talking to each other, to learn from one another... this is something that we have got to do, go back to the Nature way of life. When we see it, how the Nature works, we still don't realize that this is something that is really important for us to do what we can. Our duty is to start working with the Nature... talking with the older people because they are the ones with the knowledge...

And today the Nature is trying to show us that we are not maintaining it well. That is the reason it is drying up our medicine, drying up our berries, you name it, everything. But there is no way to change something until you come back to nature, and look at Nature.

Two female cultural experts from the Goshute Indian Reservation at Deep Creek echoed the Western Shoshone elder's perspective:

Cultural Expert #1:

...pray for the things you have, the land you respect, the things that you have, a lot of people don't even think about that. If it wasn't for the land or the air or the sun or whatever we wouldn't be here today, but I do believe that everything does have life, even the rocks. A long time ago people used to drink from the water, that was our water source, before we got our community water system, the water from the creeks. You don't even do that anymore, you don't drink the water anymore around the village anyway, you don't know what's in it. Radioactive stuff that's someting you can't see, you don't know where it goes or how far it does travel.

Cultural Expert #2:

...when we were growing up we grew up and got cedar and you treat them just like you do anything, talk to them, tell them what you're going to use them for. You don't just go and pick them because they are living things...I always try and tell my grandkids to respect things.

Cultural Expert #1:

...why live if there's nothing here to have, even the Earth and the plants and everything in the soil. Why exist?

Cultural Expert #2:

...isn't the Earth one? It's just like a body...look at all the things that's happening right now to the earth, people don't respect it. It's trying to show you that you can't treat it like that...[it's] *angry...I've noticed up here on this mountain there are a few places that are green but some areas are just dead...there's no life there in the creeks are dying, they are really going down, when I was growing up the water used to be really high where all of the creeks were flooding*

and what my grandma used to tell us was a creek coming down it doesn't have any water now but the little people that live in the mountains that they were mad because the people didn't take care of the mountains, that they're supposed to according to our tradition so they got mad and they turned the water off and now what we have isn't very much water, even from way up there it's starting to dry...I don't know how many people believe in the little people but we were taught to respect them and leave them things; even when you go hunting you're supposed to leave something for them...they are ones who take care of the land and you may not see them...I know animals do sense it [radioactivity]...

...*if you don't respect it* [the land] *it's not going to help you*...(discusses a medicinal plant)...*I don't remember what kind of plant it was but* [grandmother] *used to talk to it so you have to tell it what you want it to do. The plant was there to do things*...

Two cultural experts from the Goshute Reservation at Skull Valley were interviewed about radiation.

Cultural Expert #1:

I have been trying to see it from both sides.

Cultural Expert #2:

This is basically low level stuff, it's not the MRS stuff that's happened out there at Skull Valley; now one of the interesting points is that the low level is not regulated as strictly as the high level...

Cultural Expert #1:

...*they need a place to store it and stuff like that but I could see from what's her name's point of view...closer to where they're to put it to protect those animals but they say it's got that one big hill there, they say it won't go through that, they're safe from any radiation leaks, right? Well I could see that she's looking at it from the old ways, but I think you can combine the old way and the new way together*...

One cultural expert described how radiation was discussed in school:

Cultural Expert #1:

[radioactive waste was described as] *like a rock that was shot full of some kind of things...I would say it looks like a fire, you know, with the heat from it, that's what I would say it looks like... the heat of it* [would break the containers and radiation would get out]...*I think it would go by air...I think it would be like a fire, you would get burnt but it would go farther than that...it would start spreading from there...distance is a factor considering how much exposure through the air*...

A female Western Shoshone cultural expert from Elko expressed similar feelings:

It was never so dangerous before and everything was quiet and nice and living was good, but not anymore. [Old people] *did not fool around with things like that* [uranium]*...in their spiritual life they do know a lot of things like that, but they do not tell anybody. These are sacred, they keep it to themselves...They do tell you not to go to certain places, that it is a bad place, "don't sleep over there, don't go over there, just leave things alone." Then a lot of time they tell us not to pick anything up, things that we do not know, don't know what you are going to pick up. That is what we were told, you know, that is what my elders tell us...they tell us what to pick and what not to pick. And that is what we do, we pick what we can and we don't touch anything else...they had you talk about rocks like that* [rocks to stay away from]...

...you know elders always have to pray before they took anything. That is our way, you know. Give your blessing to it, before you touch anything. Even though you know we pick our nuts, we have to bless it first, we just do not take it...we were told not to do that, we have to pray and ask for the good side of the life. We have to give to get help. They always said you pray and, you know, have a good word for it. They say you never touch anything unless you bless it and everything like that.

My people talked about things like that, they do not like it...when they talk about it they say it is no good...they just told us not to fool around things like that...

They had that nuclear down there, a lot of people, happened in Yomba. That little town on the other side of Yomba...Gabbs, a lot of people got sick down there, a lot of people have cancer...from the nuclear, the above ground testing...people are still dying, they are still sick...it causes a lot of things. Our air is no good anymore...people never used to be sick the way they are today. A lot of people are sick with different things...it has to do with the bombing and things like that. It spreads with the air. It comes with the winds, wind carries a long way...it would travel far...as long as the wind is carrying it, it will travel real far. There is no stop to it. It can go as far as the wind goes...where it stops, it drops.

We used to have a lot of birds, you don't see them anymore. They are dying off from whatever...you never see birds anymore...That eagle used to come over here...but the bald eagle does not come over here...you do not see eagles anymore, you hardly see anything...a lot of things have changed. Even the rabbits are disappearing.

Two Western Shoshone cultural experts from Yomba discussed the relationship between rocks and radioactivity. One cultural expert discussed the belief that rocks get angry when mistreated:

You are supposed to talk to them...you talk to them, go to the same place, I guess, and they won't do anything. What happens...they get mad [if taken without being talked to, and can make people or plants sick]*...That is what they talk about, that is what they think about it...* [That's] *what they think...that rock's angry...Indian people think that...maybe someone dream about it...Indian*

knows, Indian dociors see they know, they talk to...anything, they know it, wood and everything, brush, talk...or they did know it. Dream about it, too. That's true.

When they're [the rocks] *mad, they* [Indian people] *leave them alone. Have to leave it there...they* [rocks] *won't give you nothing* [when they're mad]...

[the mountains] *Nowadays they got no snow...I don't know...maybe that bomb, maybe, that bomb shooting off, that's why...the willow is dry now...it's funny willow, too, it's no good, this year's no good, everything's no good...you can't split it good, either...*

The female cultural expert explained that gifts of money were given to hot springs as a petition to the waters to cure illness. No other kinds of gifts were given to the springs.

A second cultural expert from Yomba discussed the life-force in rocks, including radioactive elements.

...Everything's alive. They say the rocks are alive, 'cause they use that for a purpose. My parents, the old generation, they used these rocks, warm it up, lay on top during the cold nights, cool days, whatever they need to warm up with it...

There is a certain type [of rock used for doctoring]*...that pink rock, they call* ***bishapi****, they use that...and then* ***iaivi****, soft rock that's turned into powder...****iaivi*** *is white, that powder...they use that for medicine, too. They pray over it, specially...that's what the doctors do, the medicine man. I guess they say there was a lot of people cured by those rocks, years ago. To some it may harm them* [if the rock is not prayed to], *because they don't know what they're saying, or how to go about it to use that so, I don't believe there's too much harm, unless they try to destroy it or curse it or something, but they say...Indians have no curse words...*

They always say rocks will get angry...I was thinking that some rock could move, also, anywhere...if it gets angry, probably fall on somebody, if they're trying to destroy it or something...

...it's gotta be a certain kind of rock if they want to use it for certain purposes, I know people, sometimes, if they think they're in danger, build a pile of rock for safety, find a bunch of rocks and just stack it. They say some people that hate somebody, they'll make a ring and point arrow toward the individual, whoever...the power...would go a mile or so...[the power of uranium being transported from Wells] *would go a mile or so...*[with regard to containers stopping the force of uranium] *I think it could go right through because it's more like a spirit, it can go anywhere, so I don't think anyone can stop it, but maybe spirit against spirit would...*

The local effects would be the same [whether radioactive waste is transported by truck or train]...

[the spirit of uranium and its effect on an animal like a deer] *It would probably work on their brains...*

The cultural expert believed that if radioactive material was transported past a traditional hunting and gathering area, that area could no longer be used.. He described how his brother-in-law, out chasing mustangs in the Ione Valley, drank from a puddle of rainwater. He eventually died from what the cultural expert believes to have been radioactive water.

We used to drink out of the stream right here...[after testing] *we were told not to drink anywhere after the testing...we used to drink out of here all the time, and anywhere in the mountains, where the water was just bubbling up...*

He echoed the perception of the other cultural expert that, since nuclear testing:

I noticed the weather's been changing, it don't snow or get cold like it used to...less snow, less rain, drier...some places you see the willow's been dry...deer population is less now, they moved or died off or something, there isn't that many anymore. Used to see them right here in the field, does come down here, little fawns, see them walking around in the fields...there ain't much deer, I don't know what happened to the sage hens, they're less...maybe it's the atomic boom or whatever, with them eggs...the shaking of the ground will kill those chicks...the air...you find...shorten your breath sometimes...used to run around those mountains, couldn't do that after they were blasting...probably [changed] *the nature of the air in the mountains, sometimes it stay kind of high, the fallout or whatever it is...*

A Western Shoshone cultural expert from Ely related the impacts of nuclear fallout from above ground testing on the people and resources of Duckwater:

...we were members of the Duckwater Shoshone Tribe at the Duckwater Reservation in Nevada. I feel the government had overlooked us. Our mother and father got us up early to go outside to see the big flash that lit up the sky. When the dust followed the cloud, after the dust settled we could see the atomic littering, things that would come down to the ground...like snowflakes, you would catch them. And because it was only 70 air miles from the test site, we could see the airplanes following the cloud. And the government said that they did not follow the cloud, but they did. And we were the only people out there at the time that had a radio, it was poor people you know, all poor people. And my uncle gave my mother this radio and that is how we knew that there was going to be a bomb going off. And then this doctor used to come up to Duckwater once a month...And he told my mother. She asked him, "Why do the horses lay down and couldn't get up from eating this grass that turned almost black, wilted like," and he said "I know you want to keep your family together, and I would like to advise you folks to move away from here, it is right in the path of the nuclear bomb fallout"...I was young at the time...

And I stood in the doorway of the house, we had a well about from here to about that table from the house, and I stood in the doorway and watched these little birds. Just three little birds laying down, and they spread their wings out, just like a fan. And I was watching these little birds and they did not get up. And I watched them for quite a while. And I went out and I picked them up, and they were just little birds, they had just died. And they were eating out there, picking up sand, the gravel. And after that we went out, I told my dad that the little birds had died out there. And I took him out there and showed him, and he took them away with the shovel. I don't

know where he took them, but he took them away somewhere...there has been a lot of seizure death out there.

And one day my dad and I were irrigating. And there was a very little sprinkle coming down, just a very little bit, and it splattered my arm. And I had a short sleeved shirt on...and it started to blister. And then all the horses laid down and couldn't get up from eating this wilted alfalfa. That had almost turned it black, real dark green. And then, I guess, it is no wonder the mice had this disease which is called hanta virus, because it soaked down into the ground...I remember that one boy was riding a horse, and he was going across this rocky trail, and he had a seizure and come up and died. And I remember another place where a man got off at the gate and got out, and he had a seizure, and he up and died. And another girl, she had a seizure and she died. And then there is another man out at Duckwater and he had brain surgery. And there is another woman out there, her brain is kind of drying up and shrinking or something. We moved...

...a lot of us have died. There is my aunt, she died of cancer, she was a captain in the army. There is my brother, he was in the army, too, and he died of cancer. But we can't do nothing, we can't get any money or nothing from it. So, and my husband he died of that lung disease, and can't do nothing about that either...You know that valley down to Duckwater down to that other range of mountains, it was all full of dust, all full. One day we took a ride down there, and the whole valley was all full of dust, covered with dust. And then when we got home we would play with these things, and my brother got blind from doing that. From playing with this radioactive thing.

Given her history of exposure to radioactive fallout, her response to LLRW transportation was:

Well how would you feel if you were in my spot and you saw a truck go right through here and stop at the motel, how would you feel if you saw that sign with the skull's head and the bones that cross? I wouldn't want it...I believe [there is radioactivity in the land from the bombs], *it is never going away...I believe, myself, and there are a few other people who believe it too, that once that thing comes down to the earth then it is not going to go. It is not going to go anyplace, it is going to settle in the ground...These things I see fall down from the sky, now I am giving them from first hand. These things fall from the sky and just settle in the dirt and the rain on top of it, and it snows on top of it. Where do you think it goes? When the alfalfa turns black, almost black, kind of wilted, the horses can't get up...No container can contain it.*

She mentioned that she had suffered as a teenager from a brain abscess, which she said

the only abscess that could have caused that they [medical personnel?] figured could be the bomb. I had an abscess the size of a lemon...I was in the hospital a long time...I wouldn't want that atomic thing here.

A Northern Paiute cultural expert was interviewed about radioactivity and the angry rock by a member of the Las Vegas Indian Center. His comments reflect those made by other cultural experts who were interviewed.

As I understand it the rock didn't used to be angry, it became angry because of it being taken out of its natural way into something artificial and being used for something it was not intended to be used for. One is for creating another energy, it's going to be used for supposedly to help people and the other way is it's been used to destroy people. So when you change the composition of that rock and re-channel its energy, what is called radioactivity then you change its whole nature and so the result is something that is artificial and leads into all of the other things that can happen to you. The environment and the people in that environment and especially around it and if you don't turn the power to prevent it from bringing its anger out on you it's going to kill you and it will certainly alter all living things plants and other animals.

It does travel but it travels through in a different way. It travels just like everything else travels, the people, plants, animals, the earth, through kind of a field of energy and it's not discriminating and it doesn't seek out people.

And can it be contained? As it's transformed it can be, I think it can be contained physically but not spiritually, and again I think spiritually as it's been altered because it's in that energy field because it's been altered. The spirit, that's where it can do its harm in an altered form. It doesn't do any good to anybody. And there you're just in the wrong place in the wrong time, it does influence plants and animals, minerals and air, the spirit of any area it passes through. The reason somebody is sick. I don't think it's necessary to talk about how each one of these is influenced, it just is.

And you can feel it if you are there and the rock is angry, you can feel, I don't think everybody can but I think some can. Not so much that they're trained but those are the special ones, the special people. Not all Indians can feel it, not all non-Indians can feel it, but those who have certain qualities can. They can't control it physically but they can control it spiritually. There are cumulative impacts certain from radioactive exposure and it changes if something happened the first time, the environment it happens over a longer period of time.

The question that comes up is can the environment be protected spiritually or physically from radioactive impacts. I don't believe so because it's been altered and its not natural no matter what you do. In a non-spiritual way, let's say scientific, you may contain it for a little while but not forever--the only way you can control it is to, and I'm sure other Indians feel the same way, is if you don't do this anymore. Don't make weapons out of these rocks or what you get out of them. Don't even use it for other purposes for health reasons because it's not natural. There are other ways to cure the body, because in the long run they damage the physical as well as the spiritual parts of the human body. There's nothing that can be done to restore the environment once its been impacted by radioactivity except my feeling is that it has to do with the spiritual leader Hobokah who talks about the ancestors coming back and the old ways coming back.

A Chemehuevi Paiute cultural expert from the Chemehuevi Indian Reservation was interviewed regarding his perspective on radioactivity and Indian landscapes and resources. One particular concern was with regard to basin-wide impacts to the Chemehuevi homeland. Again, the metaphor of the angry rock is prominent.

The Chemehuevi perspective about radiation is that it's bad, the reason being is that it's not natural, that it's created by man and it is not of the earth, although the elements are used to develop uranium and plutonium. The spirituality of the people when dealing with the land and the resources is to take what you need and leave the rest behind, it was never to overkill in any way, shape or form. Respect the land, the animals, everything, and give thanks before you take it or your use for consumption.

Radioactive waste is new to us as Indian people. The development of nuclear weapons in the United States...scientists did not know what to do with [it], it was a power beyond their control primarily as a weapon of mass destruction. Little did they know about the pressure, the fallout, the contamination, a number of different diseases and sicknesses created by it, they were blind to it, they created a monster and they don't know how to handle it as far as technology goes. The technology of putting waste in 55 gallon steel drums is ridiculous because once you put it into the earth they are going to disintegrate and rust and leak...there's a huge aquifer that's been contaminated by all of the waste that's been dumped there for many, many years, that's the largest aquifer in the northern US and it cannot be used for consumption .We fear the same thing with Ward Valley and the NTS as far as the science goes there's still no safe way to dispose of radioactive waste as far as we know...you can't see it, you can't smell it, you can't taste it, it's not natural, it's out of this earth and the only radiation that comes off the sun but that's natural.

As far as the transportation of waste there's a lot of unknowns and we don't know what the consequences are. We know there are many sicknesses that come out from people that have been contaminated by nuclear waste and as far as Indian people go, we show respect to the land, show respect to other people, for the animals, the plants, the rocks. The power of the rock--just looking at Chemehuevi Mountain, it's a very spiritual mountain from this perspective right here. When I look out towards the mountains and I don't just see a mountain, I see a place of power, I see a place where I can go and meditate and speak with the Creator directly and ask for prayers and blessings for people directly. Just like anything else, you have to give prayers all the time because the creator is here to watch and protect over us. I feel that we wouldn't have come this far if he wasn't here to watch over us and we are here to pray and we are here to protect the other resources.

...the rocks are angry, yes, they're striking out saying "don't do this to me, don't touch me, don't let this happen." In a sense you look at it from a spirituality standpoint, it's the spirits of Mother Earth telling us don't mess with Mother Earth.

I can envision the animals standing back once it goes through for the first time and they recognize that there's a danger that they would move away because of fear. That they would no longer be there and that there's something bad coming down the road and they disperse and move away into different corridors. Kind of like a dust storm, they disperse and move further and further away. I see it from the animals' standpoint, they're a lot smarter than us and they've been doing this for longer than us and their senses are more keen and I think the animals would get back and it would create dead zones throughout the country. Through these corridors or transportation routes of course at the site there will be those that are curious who want to go see

but they, in turn, they would be the ones that would die because of contamination of some sort. The ones who are in tune to the community and the environment will stay away.

...they are creating another nightmare all of the contaminants are going up into the atmosphere and are falling back onto Mother Earth and its contaminating the land, animals, plants, and it's still waste no matter what they say about it, the force is so strong that its hard to describe. When we're talking about these routes it's a force that's going through these areas, it's a very powerful force.

When they talk about spirituality or sacred sites, it's not for them to know about certain things...the study...it didn't reflect certain things, why we're given explanations because they knew they couldn't reveal why certain things are happening that are out in the desert...there's a lot of people that know but feel that these things are so sacred that they can't share that...It's just not for you to know. There are things that we will share with you, but once it gets down to the nitty gritty we're not going to share nothing.

...She's [Mother Earth] *groaning and twisting and turning and she's very angry...*

When you look at it from a Chemehuevi perspective that our people, it goes beyond our perspective, it affects every living creature there is...

...there's quite a number of springs and streams that have dried up that used to flow that are no longer there, just evidence that this was a stream, this was a little water here and I think that speaks for itself the reason for it; Chemehuevis believe in little people, too, out there. Not everybody can go and see them...they're always going to be there and it'll be like a chain reaction because of the disruption of the chain of life, of the cycle; the Creator's angry, Mother Earth's angry, they're striking back, they won't let you take any more of the resources; they are groaning, and twisting and turning, getting ready to erupt.

A Mohave cultural expert interviewed at CRIT perceived the idea of radiation more from a western scientific viewpoint.

...It's more physical than spiritual from my point of view...but...the aura is alive with uranium and again that's where you get your cancer from...it's still active no matter what, it's still there and what a lot of people do fear and that's what a lot of Indian people have noticed...they had spiritual ways of getting what they needed from the earth [referring to the possibility that uranium was mined for yellow paint*]... it could of...I think all tribal people do, all of the different tribes. They did it all ceremoniously with what they needed.*

Two Chemehuevi cultural experts were interviewed at the CRIT museum. His comments were centered on traditional Chemehuevi stories and resources, which illustrate the life-forces inherent in plants, animals, rocks, mountains, and other environmental resources. His comments provide a window into the Chemehuevi "storied landscape."

Back in the old days when the animals were people, the animals used to have to sneak out at night because the sun was so mean; he threw sparks at them or he burned them...one day these animals decided that they were gonna put a stop to this, so they decided and they took a vote and they decided that the rabbit , he was the one that was going to, the cottontail, because of his quickness and his movements, he was the one that was gonna go out there and fight the sun. So, this old rabbit, he goes out there at sundown or before the sun came up every morning when they gather their water, well he would go and ask the trees, he says, "Do you burn"? and they say, "Yeah, I burn," and go and ask another, "Do you burn?" and they'd say "Yeah, I...", well he finally came to this one bush and he said "Do you burn?" and he said "No, I don't burn." And he said "OK, well I'm gonna dig a hole under you right here, by your roots," he said, "and tomorrow morning when the sun comes up I'm gonna come over here and I'm gonna hide in here and as soon as the sun comes up I'm gonna run out with my rocks and I'm gonna bombard him and I'm gonna run and duck back in this, underneath this tree," under there because he don't burn. So that was the plan, so they went back the next day, they all came out, the rabbit went back out there and he went, sure enough, he went under this tree, and the old mean old sun came up looking for somebody to scorch and hit again, so, looking around, the rabbit gets his rocks, he runs out there real fast and he bombards him, he scares him all over. And the sun has swollen spots here and swollen spots there, and he just ticks the rabbit on the back of his head, and...the rabbit he runs back underneath this tree, underneath this yucca tree, and he hides down in there and sure enough, all the weeds and everything burns around him except that little bush, and when it all comes down, he runs out and he goes back into his cave. But a spark hit the cottontail on the back of his head, and today you'll see where the cottontail has a speck on his back, that's where he got it, from the sun...That is the story of how the rabbit declared war on the sun and he bombarded him...

When I was out there I asked this ranger "Is there a brush, a tree around here that doesn't burn?" and he said, "Oh yeah, that's the Mojave yucca, that grows around here, the Mojave yucca, he says it's very resistant to fire, everything'll burn but that one won't...that was in the rabbit story...there is such a tree that is resistant to fire...

...it does mention that they were in a cave, and this is where they had to hide, in this cave, to keep so the sun wouldn't see them or bomb them with the heat...that story related to the Chemehuevis when they came from the north and down into the hot desert, it took them a long time to get used to the heat, and this is how that story came up that the sun was mean and it burned them or bombed them or whatever, because it took them a while to overcome and get used to living out there in the hot desert, although up there in the Providence Mountains it doesn't because that's pinon trees and water holes and stuff up there it doesn't appear to be a place that would get that hot...I realized that that story was told about that little area right there...

I think there's a lot of Chemehuevi stories that deal with...relate to that area and Charleston Peak and Moapa, because of that ...they talk about the coyote and the wolf making trips up that way and coming back and they always went up towards Moapa and...Pahrump, a lot of our tales are people going up towards Pahrump because I don't think there's no mountains between here and Pahrump because all the mountains laid that way and everything was, they didn't have to

cross any mountain ranges to really get from this area to Pahrump. A lot of their stories are about that area. There were stories and there are legends...all take place in that area around there, the big mountain up there. That big mountain is our spirit mountain up there, that's, in Chemehuevi it's called "having snow," that's Charleston mountain, Mount Charleston, that's our sacred mountain. When we die that's where we all go...we all go to that one place...a place where you're gonna go when you die. And consequently their stories are all, their legends and everything all...lean that way or all have that meaning to them, you'll find that in the Chemehuevi legends where you die and you're reborn again, you die and get up again, because of that they figure you go to that...sacred mountain and you'll meet your family there again... the Wolf has that power too [to bring people back]*...as birds...*

...that story about the sun, that was almost one of the last...stories about when the animals were people on this earth, because after that happened and after the earth burns, when he bombarded the sun and the sun blew up and started burning and devouring everything, the legend says these animals, they retreated, now they retreated into the high Sierras...and they say, in the Chemehuevi language they would say [Indian term] *because it's all white and clean and the mountains are all just white and clean and it never, it didn't burn...even today the white of the mountains are all just clean and white because it didn't burn. And this is where they retreated to. When they were there, this is when they seen the two strange creatures who were a little boy and a little girl. When they get up there, which was the land of the giants, big animals lived up there...they seen these two strange creatures...a boy and a girl...or humans or some relation, those two were the ones that went north up that way towards, into Utah or someplace, this is where...in the story, when the Indians tell the story they say a brother and sister, they were the ones that went and had the kids up there, where all...their kids became the Paiutes and the Chemehuevis and up in that area, and the Chemehuevis, they migrated back down to the Providence Mountains, and that story starts right there...that was the birth of the Chemehuevis...when the people finally come around, all the animals and all the plants that were, up until then, the main actor who was speaking of the people of this world, up until that point when the people came along, all these animals and all the plants got together, now this is where the medicine man comes in—all these plants and all these animals got together and said..."man is coming to this earth and we're going to look after them. I'm going to be his food, I'm going to help him be his medicine, I'm going to do this for them," and this where the medicine man in his being learned where all that medicine and what tree and what plant, where they were all at, he was the only one that knew that, because these trees and the animals they had already got together and said this is what they were going to be and how they were going to do it...This is why nobody but a gifted person...knows what is out there or what it's supposed to be for, why it's there. Everything is there for a purpose, and that's how the medicine man learned it, when they came all the trees and the plants and everything sat down and said "this is what I'm gonna be, and this how we're gonna do it, we're gonna let that guy...know that I do this and I do that"...that's how they became...medicine man. If he could dream in his dream about certain trees and know what this was all about, those became his property and he took care of the holy land...*

Sometimes, you would get the impression in listening to stories, in their [elders or medicine men] *stories you would get the impression that the mountain did talk, you know, that the mountain*

would talk to them, would convey a message to someone...you get the impression that someone did tell them something, and a lot of times you would think it was a mountain.

[On crystals] *Well, to a Chemehuevi, a crystal is like a, it's like a good luck charm. To the Mohave people, the crystal is a taboo. They won't associate with them, they won't even look at them. It's a bad omen for them.*

[On medicine rocks] *...only the ordinary...Indians...all Indian warriors, all Indian people had....some sort of gift that they did, that was their own. And when they came to the medicine rocks, they knew...they'd stack 'em here...they would leave a gift, or they would leave something...if you had someone in your family that was sick, or someone that was struggling with something, or somebody was having a problem with just about anything, and you passed one of those rocks, this is where it would be, that was like saying a prayer for them, it was like lighting a candle for them, you know, and they would leave a gift or put money there or whatever, this is all they would do, that they did when they believed there was a need for it.*

If you got someone there, a shaman or a medicine man there, he could get around that rock, he would know that it's a power rock, he would know right away. He would definitely get a feeling, get that feeling and know that it's, whether it's a power rock...some of them were for wishing, and a lot of them were to strengthen you, give you the will, the power or whatever, to go on, to continue on, you know. [Power rocks] *can be found just about anywhere; power rocks are usually found where there could of been some sort of settlement...up in the Ruby mountains, they frequented the Ruby mountains a lot, so there's stuff up there in the Ruby mountains. that are part of the Chemehuevi territory that nobody even knows about. Small tribes...like the Chemehuevis...stayed in the high country or the mountains...probably for their own protection. They have a lot of stories to tell about the mountains.*

[On trails] *...they were all Paiute trails. They were used by all the other tribes for trading, or...mostly they were just Chemehuevi trails, they traded with everybody...they were people that lived out there in the desert. Even my grandpa used to tell me about him and his brother walking to Riverside all the time, from Chemehuevi Valley...it would take them four or five days...they would go from water hole to water hole, that's real desert. They just knew the country...they just knew the mountains and knew what it looked like, and they knew...they had a definite idea where they were when they were out there, they almost knew what was over the next horizon, you know, they knew where the next water hole was, they knew what direction to walk to get to the next water hole.*

[On whether songs sung on trails were related to timing and served as road maps] *Yeah, definitely...they would sing one song here, and sing as he's going...in the old days, if he sat here like he sat in Chemehuevi Valley and he sang you a song in his mind, his mind is over there and he'll relate that, he'll relate where he's at by singing his song, he's saying I'm over there, yeah, that's true, very true. They have the...Deer Song, and the Mountain Goat Song, and they all originate right here in the Whipple mountains here and they go, the Deer Song goes that way and the Mountain Goat Song goes that way, whereas the Salt Song starts up here and goes all the way up around and back down around this other way...and there are a lot of songs like that,*

that were hunting songs, the people that, the hunters that was their song, he told them how or where to go...it's like a road map across the desert...the Chemehuevi had songs like that about the desert too. It told...at a certain time where you had to be, this is why even in the Salt Song they say, they have their evening songs and their morning songs, the morning songs are all basically all out here at the California side and Arizona. Their evening songs were all up here in Arizona and through, up through Hualapai and Utah and back down through Nevada, but the morning songs cover all of California, just one spot after the other, you know.

The Salt Song is sung from sundown to sunup, just one night. That's the way the Bird Song is sung , too, from usually one sundown to another sundown. The Bird Song is kind of different in that it's a flock of birds flying around, up the river, and they're going here and going there, and on, and as they go along, as they make their trip around the song, a few birds, one bird stops and says "I'm gonna stay here." And this whole flock of birds as they're flying along one bird drops off and he's going to stay there, and they go along, and the whole song goes along, and it just puts all...that's why this area is, flourishes with all kinds of birds, it goes along and distributes them here and all around, you know. Primarily that's what the Bird Song's about. That's why we have so many birds all up and down the river, all over this area, and out there in the desert. That's a song about how they got there and what they did, the turmoil that they went through getting out there, and it takes one night, from one sundown to sunup. And the Salt Song is the same way only it covers a long, long area...they sing, Paiute, they sing the Salt Song, they aing the very same songs that the Chemehuevi sing...you hear the Salt Song all the way up in Cedar City, and you'd wonder, why would that song be, go so far? In the legend about the song, two sisters that made that journey and singing the songs and telling about this and telling about everything, when they get up there in the north...one sister keeps on going and one comes back, and I guess in the story that's where it tells, that's why they sing it and that's why we sing it, because of the two sisters, and that's how, that's why that song is sang up that way and is sang down here...

...they sang it just about every time, they sing it at funerals, they did sing it every time they had some kind of social gathering, you know when families gathered, if they were...usually in the spring time...it all depended on what...mainly the Salt Song, but they would sing other songs, maybe the Goat Song or the Deer Song, or...it depended on what, who...the oldest singer, the Deer Song or the Salt Song, the oldest one was the dominant singer, it's his song that they would sing at this gathering, it didn't have to be a memorial or a funeral, or whatever, it could have...been just a family having a reunion where on family's out having a party or whatever...mainly, a lot of times these families did that, sang a song so they knew to renew their songs or learn new words in their language, or learn something that had happened within the past year...or the singer may have had the song...he may have went someplace and learned another song, or a significant song, or he may have remembered something in his stories that gave him a new song...this would be the time for him to share it or give it to one of his family members...They had songs...that they sang about different moods, different things, about life in general, about what they wanted, what they seen what was going to happen...

The high shaman, the chiefs at that time generally the Chiefs during that period, they were people that owned, that they called [says Indian term]*, and yet you won't hear Paiutes or*

Chemehuevis talk about the [Indian term] *song, because it's a sacred song, only he was in possession of it, and only his family, and no one but him could sing it, no one but a member of his family could dance to it when he sings it, he's the elder...and he had the power of sending the spirits...down...if he didn't come, this is why they had that powwow, if he didn't come and sing his song to send them away, then their spirits stay in this area...waiting...when he came and had that memorial and he sang his talking song, or his song, only he could send them on their journey to the spirit land or the high country or whatever...he could send them over the rainbow, the Milky Way, the Milky Way is known as the road of the gods, that's what they call it...the Chemehuevis they looked up into the heavens and stories about the...North Star, the Dipper, and the Chemehuevis they have stories about the stars...from the stories that I've heard, there has to be somebody that looked, kept track of the heavenly bodies, of the sun, because I know in Chemehuevi legends they have a lot of mention to the angle of the shadows you know, and stuff like that...they have to have somebody that more or less specialized in the heavenly bodies, I would think...*

I believe they did [teach apprentices at fall gatherings]*...or pass along to one another what they learned or what they seen...or something happened that was new, things like that...I'm pretty sure they did...there's a story just about almost every star up there.*

Chemehuevis are very superstitious people...any...Chemehuevi person in the older generation, not too much today...the older Indian Chemehuevi , anything that came to pass...or died, so to speak, they would never mention it again, they wouldn't talk about it, wouldn't mention it again, so something was killed, and they referred to it as a place that used to be, they won't tell stories about it , they won't mention it by name, same way that a person that dies, when they speak of a dead person, they say the person that used to be, they won't mention his name or nothing, they just say a person that used to be and then people or a place that has been destroyed or died, they would refer to it as the same place, a place that used to be, like it didn't exist no more, that's something that they're not going to mention, they're not going to talk about it...

[On the possible connection between radiation and a power rock]*...it* [the rock] *would be affected, but I can't really say how, but I imagine it would be affected because you could say, it was a problem that concerns the people, if it's a problem that they are worried about, then it would definitely affect the rock because that rock would...it would lose its power...the field would destroy it. Or* [make it] *angry...a radioactive rock that has been used up...it would be considered an angry spirit, it would be, dead. The mother rock would remember...in the Indian way of thinking, to put a bad rock back there would be, something that they couldn't cope with...to the Chemehuevi people, anything that's dead or has died, or has been use up is bad, it's taboo, it's not right, it's not good. And they have a special kind of spiritual man that take care of that.*

(Chemehuevi woman): *The Doctor Rock is a helper and it's always a positive thing, a positive force helping if it gets too negative and stuff like that, I'm sure, I don't know but I'm sure it defends itself, it has to...a shaman he wouldn't know how to use that power...and the rock works with him...it still has power...*

[On whether the interaction of a power rock and radiation would spiritually affect a nearby spring]...*it would, it would all depend on the reaction that that rock feels, if it was threatened, more than likely it's gonna defend itself one way or the other, more than likely it'll probably take back its gift [meaning the water]...but it depends on the severity of its reaction, whatever it feels appropriate, if it really feels...challenged...it could dry up altogether, could be anything. Or it could just cease to exist, collapse within...it's all a gift that we're given from our Mother Earth and our Great Spirit gives it, the air that we breathe, the water to drink, trees to eat off of, all that's just a , it's a gift that we're allowed to have or allowed to use.*

A Chemehuevi woman who works in the environmental protection division of the CRIT tribal government was interviewed about her perspective on radiation. She provided viewpoints that blend of traditional Indian world view and that of western science:

It's kind of hard to stay in the center of these two theories [traditional Native American view and western science view]...*Europeans came and took it* [rock] *without permission and they used it...we as Native Americans enjoy the luxury of what this rock produced...If we want to continue to enjoy what this rock does what we also have to do is understand that by exploiting all of this stuff and taking it out and enjoying it we are doing the same thing as the people that are taking it out. We're enjoying what it's given us, it's given us power, electricity, because there's money and everything else involved so it's kind of hard when you really think about what this precious rock has provided us and I can see. But in the waste products when it's been used kind of like when you've been used you are no longer as powerful and useful anymore so you need to be either destroyed or put away. And it can't be destroyed so it has to be put away someplace in a landfill or store it...out technology isn't as advanced or sophisticated as it should be...they said they were going to do all this stuff, they said that in twenty years they were going to have a solution to everything and that didn't happen. Because it was never supposed to be used like that. That was never supposed to happen, that was not why it was given to us. But we did use it that way and now we have to find a solution for it, but it's rebelling and it's coming back at us...I know that they're going to do everything in their power to make sure that this radiation stuff is not going to leak or is not going to come out or go into our water. They have gone through all kinds of testing and looked at all types of boxes and capsules and reinforcements...and stuff for this stuff to be put in but there's still room for accidents and they're going to be on our highways, and there's always going to be room for human error...you can see the damage and chaos it creates in little communities...people that are affected, it's not just Native Americans, it is everybody...I don't know what you would do with this rock if it's angry and this is its way of rebelling, getting back. I think as a Native American I would backstep and ask for forgiveness. Sometimes forgiving is not very easy because there's sacrifices we have to make and there's consequences...I don't think it can be done as a group, it's an individual thing and each one of us has to go back and...ask for forgiveness for what has taken place. It's not just only that I think it's going to be more complicated than going out into the mountains and saying, "hey, I'm sorry, I won't do this, I won't do that and I won't bother you anymore. There's a lot of other things that need to be forgiven. The rock is the most precious and it's the largest and it's the one that needs to be forgiven the most. There's a lot of small forgiveness that have to be given before the large rock. I think it's a stepping stone...*

Talking to spirits that they help us, they guide us and what they do when we go against them and what they do when we waant to do not what they want us to do, then we have to ask for forgiveness. We always take a rock, we always take something, and then we pick up a rock, we always leave something, a piece or a cigarette, so you take and then you give back and if you don't need it, then you don't take itand you don't touch it, you leave it there. That's how we were raised and that's our society, how it was and how our forefathers lived, it's hard to go back, but I think stepping back and looking back, we can never go back to the way it used to be, but I think we need to step back and look at some of the things that were done and how our forefathers handled some of these things.

...this is a living world and...you still have the environment to deal with and the vegetation and the soil...I think that it's one in the same because it is a living world. That's our vegetation and our ground and everything...These are our livelihoods and they're the ones taking care of our stuff and, yeah, we listen to them, but we're environmentalists and we're concerned about this, but we're the minority. We are the minority group in all of this and no one really listens to us if it's going to stand in the way of progress...

Summary: Radiation, Resources and American Indian Cultural Landscapes

The viewpoints expressed in these interviews are consistent with those recorded during previous studies dealing with radioactive waste storage facilities. Thus, through a process of longer-term research and interviewing, a clearer understanding of an Indian view of traditional interactions with resource components of cultural landscapes and the effects of radiation is evolving.

It is clear from these interviews that Indian people hold a variety of beliefs about radioactivity and the nature of radiation. These beliefs range from a traditional view to more modern, western scientific understandings. In between, many individuals hold mixed views which combine aspects of the traditional Indian perspective with those of modern western science.

Despite this variation, two generalizations can be made based on all of the interviews conducted on this topic. The first is that radiation is most often perceived to be dangerous, both to humans and the environment, including the resources within that environment.

The second is that, whatever the point of departure in terms of an individual Indian person's perception of radiation--traditional, modern, or mixed--those perceptions cannot be separated from the fundamental belief, held by virtually all respondents, that resources, places, and other elements of the environment are inherently endowed with power, life-force, and will. Consequently, resources should be treated with respect and handled or used appropriately, usually through the medium of prayer, song, or ceremony. If treated inappropriately, the resource can use its will and power against individuals, families, and larger groups of people, even the ethnic group.

Moreover, all of these elements are inextricably interconnected and interdependent--through what we have called *synergistic associations* (Stoffle, Halmo and Evans 1998)--and infused with cultural meaning by Indian people, which make them components of sacred cultural landscapes. Thus as in modern systems analysis, including ecosystem studies, an adverse impact in one component of the system can potentially cause adverse impacts, or "ripple effects," in other parts of the system. This same principle holds true from an Indian perspective within cultural landscapes. Cumulative effects of radiation, seen to be caused by mistreatment of rock, land, air and water, are believed to be illustrated in such phenomena as increased human illness and death, pollution, the drying up of springs, angry rocks, the disappearance of plants, and perhaps such modern events as bad weather episodes, drought and other processes that stem from the anger of the earth and its component parts (rock, water, etc.).

The interconnectedness of the components of cultural landscapes extends far backward in time to the creations of Indian ethnic groups in their respective holy lands. The belief in this interconnectedness persists in contemporary times through songs, stories, and landmarks dispersed throughout each ethnic group's respective cultural landscapes.

In the long history of perceived mistreatment of land and resources--all integral, synergistically associated parts of cultural landscapes once under the sovereign control of Indian people--the development, production, use, transportation and storage of radioactive materials, whether high-level or low-level, on or near Indian lands is seen as another disrespectful act by non-Indian people, the consequences of which could be grave for both humans and the environments on which they depend.

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U.S. Department of Transportation (DOT), "Hazardous Materials, Tables, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements: Class 7 (radioactive) material," *Code of Federal Regulations*, Office of the Federal Register, National Records and Archives Administration, U.S. Government Printing Office, Washington, DC, 1996.

49 CFR 174.204
DOT, "Carraige by Rail: Tank car delivery of gases, including cyrogenic liquids," *Code of Federal Regulations*, Office of the Federal Register, National Records and Archives Administration, U.S. Government Printing Office, Washington, DC, 1996.

49 CFR 175
DOT, "Carraige by Aircraft," *Code of Federal Regulations*, Office of the Federal Register, National Records and Archives Administration, U.S. Government Printing Office, Washington, DC, 1996.

49 CFR 397
DOT, "Transportation of Hazardous Material: Driving and Parking Rules," *Code of Federal Regulations*, Office of the Federal Register, National Records and Archives Administration, U.S. Government Printing Office, Washington, DC, 1996

67 Stat. B132 (1953)
"Indians." (August 1, 1953; House Concurrent Resolution)

PL 96-227
"Paiute Indian Tribe of Utah Restoration Act." (April 3, 1980; 94 Stat. 317)

PL 99-499
"Superfund Amendments and Reauthorization Act of 1986." (October 17, 1986; 100 Stat. 1613)

PL 101-408

Public Law, "Indian Environmental Regulatory Enhancement Act of 1990." (October 4, 1990; 104 Stat. 883)

PL 101-426

"Radiation Exposure Compensation Act." (October 15, 1990; 104 Stat. 920)

PL 103-311

Public Law, "To amend the Hazardous Materials Transportation Act to authorize appropriations for fiscal years 1994, 1995, 1996, and 1997, and for other purposes." (August 26, 1994; 108 Stat. 1673)

42 USC 9601-9675

Public Health and Welfare, "Comprehensive Environmental Response, Compensation, and Liability: Hazardous Substances Releases, Liability, Compensation," United States Code.

49 USCS 5101 et seq.

Transportation, "General and Intermodal Programs: Transportation of Hazardous Material," United States Code.

DOE Order 5820.2A

Radioactive Waste Management, September 26, 1988.

Appendix A

1994 Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments

Federal Register
Vol. 59, No. 85
Wednesday, May 4, 1994

Title 3 — Memorandum of April 29, 1994

The President Government-to-Government Relations With Native American Tribal Governments

Memorandum for the Heads of Executive Departments and Agencies

The United States Government has a unique legal relationship with Native American tribal governments as set forth in the Constitution of the United States, treaties, statutes, and court decisions. As executive departments and agencies undertake activities affecting Native American tribal rights or trust resources, such activities should be implemented in a knowledgeable, sensitive manner respectful of tribal sovereignty. Today, as part of an historic meeting. I am outlining principles that executive departments and agencies, including every component bureau and office, are to follow in their interactions with Native American tribal governments. The purpose of these principles is to clarify our responsibility to ensure that the Federal Government operates within a government-to-government relationship with federally recognized Native American tribes. I am strongly committed to building a more effective day-to-day working relationship reflecting respect for the rights of self-government due the sovereign tribal governments.

In order to ensure that the rights of sovereign tribal governments are fully respected, executive branch activities shall be guided by the following:

(a) The head of each executive department and agency shall be responsible for ensuring that the department or agency operates within a government-to-government relationship with federally recognized tribal governments.

(b) Each executive department and agency shall consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that effect federally recognized tribal governments. All such consultations are to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals.

(c) Each executive department and agency shall assess the impact of Federal Government plans, projects, programs, and activities on tribal trust resources and assure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities.

(d) Each executive department and agency shall take appropriate steps to

remove any procedural impediments to working directly and effectively with tribal governments on activities that affect the trust property and/or governmental rights of the tribes.

(e) Each executive departments and agency shall work cooperatively with other Federal departments and agencies to enlist their interest and support in cooperative efforts, where appropriate, to accomplish the goals of this memorandum.

(f) Each executive department and agency shall apply the requirements of Executive Orders Nos. 12875 ("Enhancing the Intergovernmental Partnership"0 and 12866 ("Regulatory Planning and Review") to design solutions and tailor Federal programs, in appropriate circumstances, to address specific or unique needs of tribal communities.

The head of each executive department and agency shall ensure that the department or agency's bureaus and components are fully aware of this memorandum, through publication or other means, and that they are in compliance with its requirements.

This memorandum is intended only to improve the internal management of the executive branch and is not intended to, and does not, create any right to administrative or judicial review, or any other right or benefit or trust responsibility, substantive or procedural, enforceable by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

The Director of the Office of Management and Budget is authorized and directed to publish this memorandum in the Federal Register.

/s/ William J. Clinton

THE WHITE HOUSE,
Washington, April 29, 1994.

{FR Doc. 94-10877
Filed 5-2-94: 3:49 p.m.}
Billing code 3110-01-M

Editorial note: For the President's remarks to American Indian and Native Alaska tribal leaders, see the *Weekly Compilation of Presidential Documents* (vol. 30, issue 18)

On May 18, 1994, Secretary of Energy, Hazel R. O'Leary, issued the following memorandum to all Departmental elements:

The Secretary of Energy
Washington, DC 20585

May 18, 1994

MEMORANDUM FOR ALL DEPARTMENTAL ELEMENTS

FROM: **HAZEL R. O'LEARY**

SUBJECT: **GOVERNMENT-TO-GOVERNMENT RELATIONS WITH NATIVE AMERICAN TRIBAL GOVERNMENTS**

The attached memorandum signed by the President on April 29, 1994, outlines principles that define our responsibility to ensure that the Department operates within a government-to-government relationship with all federally-recognized tribal governments. Accordingly, you are hereby requested to ensure that all program components that fall within your purview are fully aware of the intent of this Presidential directive. Additionally, you are requested to ensure that the rights of sovereign tribal governments are fully respected and that departmental activities affecting Native American tribal rights or trust resources are implemented in a knowledgeable and sensitive manner respectful of this tribal sovereignty.

The attached Department of Energy American Indian Policy is consistent with the principles outlined in this Presidential memorandum. Its purpose is to provide you with further guidance as we work toward implementing departmental activities and actions affecting tribal governments.

Thank you for your cooperation and assistance.

Attachments

Appendix B

DOE Order 1230.2 – Attatchment 1 - U.S. Department of Energy American Indian Policy

U.S. DEPARTMENT OF ENERGY
AMERICAN INDIAN POLICY

PURPOSE

This policy outlines the principles to be followed by the Department of Energy (DOE) in its interaction with federally-recognized American Indian Tribes. It is based on Federal policy, treaties, Federal law and the DOE's responsibilities as a Federal agency to ensure that tribal rights and interests are identified and considered in pertinent decision-making. The policy provides general guidance to DOE personnel for management actions affecting American Indians and emphasizes implementation of such activities in a knowledgeable and sensitive manner. This policy does not affect DOE interactions with State-recognized Tribes with respect to matters provided for by statute or regulation.

DEFINITION

INDIAN COUNTRY means (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. (18USCS 1151)

BACKGROUND

American Indian Tribal Governments have a special and unique legal and political relationship with the Government of the United States, defined by history, treaties, statutes, court decisions, and the U.S. Constitution. The United States has entered into more than 600 treaties and agreements with American Indian Tribes. These treaties and agreements create a variety of legal responsibilities by the United States toward American Indian Tribes and provide the basis for a government-to-government relationship. Other responsibilities toward American Indians are created by Congress through statutory enactments. Although the Department of the Interior, through the Bureau of Indian Affairs has the principal responsibility for upholding obligations of the Federal Government to American Indians, this responsibility extends to all Federal agencies.

POLICY

1. THE DEPARTMENT RECOGNIZES AND COMMITS TO A GOVERNMENT-TO-GOVERNMENT RELATIONSHIP WITH AMERICAN INDIAN TRIBAL GOVERNMENTS.

DOE recognizes Tribal governments as sovereign entities with, in most cases, primary authority and responsibility for Indian country. In keeping with the principle of American Indian self-government, the Department will view Tribal governments as the appropriate non-Federal parties for making decisions affecting Indian country, its energy resources and environments, and the health and welfare of its populace. The Department will recognize the right of each Tribe to set its own priorities and goals in developing and managing its energy resources. The Department recognizes that some Tribes have treaty-protected interests in resources outside reservation boundaries.

2. DOE RECOGNIZES THAT A TRUST RELATIONSHIP DERIVES FROM THE HISTORICAL RELATIONSHIP BETWEEN THE FEDERAL GOVERNMENT AND AMERICAN INDIAN TRIBES AS EXPRESSED IN CERTAIN TREATIES AND FEDERAL INDIAN LAW.

In keeping with the trust responsibility, the DOE will consult with Tribal governments regarding the impact of DOE activities on the energy, environmental and natural resources of American Indian Tribes when carrying out its responsibilities.

3. THE DEPARTMENT WILL CONSULT WITH TRIBAL GOVERNMENTS TO ASSURE THAT TRIBAL RIGHTS AND CONCERNS ARE CONSIDERED PRIOR TO DOE TAKING ACTIONS, MAKING DECISIONS OR IMPLEMENTING PROGRAMS THAT MAY AFFECT TRIBES.

The DOE will take a proactive approach to solicit input from Tribal governments on departmental policies and issues. The Department will encourage Tribal Governments and their members to participate fully in the national and regional dialogues concerning departmental programs and issues.

4. CONSISTENT WITH FEDERAL CULTURAL RESOURCE LAWS AND THE AMERICAN INDIAN RELIGIOUS FREEDOM ACT (P.L. 95-341), EACH FIELD OFFICE OR DOE INSTALLATION WITH AREAS OF CULTURAL OR RELIGIOUS CONCERN TO AMERICAN INDIANS WILL CONSULT WITH THEM ABOUT THE POTENTIAL IMPACTS OF PROPOSED DOE ACTIONS ON THOSE RESOURCES AND WILL AVOID UNNECESSARY INTERFERENCE WITH TRADITIONAL RELIGIOUS PRACTICES.

DOE will comply with all cultural resource legislation and implementing regulations in the management and operation of its programs and facilities. Consultation with appropriate American Indian tribal governments is part of the compliance process involving Federal cultural resource laws and the American Indian Religious Freedom Act. Consultation may include, but is not limited to (1) the exchange of information concerning the location and management of cultural resources (2) repatriation or other disposition of objects and human remains (3) access to sacred areas and traditional resources located on DOE lands in accordance with safety, health and national security considerations, and (4) assessment of potential community impacts.

5. THE DEPARTMENT WILL IDENTIFY AND SEEK TO REMOVE IMPEDIMENTS TO WORKING DIRECTLY AND EFFECTIVELY WITH TRIBAL GOVERNMENTS ON DOE PROGRAMS.

DOE recognizes that there may be regulatory, statutory and/or procedural impediments which limit or restrict our ability to work effectively and consistently with Tribes. In keeping with this policy, we will seek to remove any such impediments. Additionally, we will, to the maximum extent permitted by law, apply existing statutory, regulatory, and procedural requirements in a manner that furthers the goals of this policy.

6. THE DEPARTMENT WILL WORK WITH OTHER FEDERAL AND STATE AGENCIES THAT HAVE RELATED RESPONSIBILITIES TO CLARIFY THE ROLES, RESPONSIBILITIES AND RELATIONSHIPS OF OUR RESPECTIVE ORGANIZATIONS AS THEY RELATE TO TRIBAL MATTERS.

DOE will seek and promote cooperation with other agencies that have related responsibilities. In many areas of concern to DOE, cooperation and mutual consideration among neighboring governments (Federal, State, Tribal and local) is essential. Accordingly, DOE will encourage early communication and cooperation among all governmental parties. This recognizes that the principle of comity among equals and neighbors often serves the best interests of all parties.

7. THE DEPARTMENT WILL INCORPORATE THIS POLICY INTO ITS ONGOING AND LONG-TERM PLANNING AND MANAGEMENT PROCESSES.

It is key to this effort to ensure that the principles of this policy are effectively institutionalized by incorporating them into the Department's ongoing and long-term planning and management processes. Department managers will include specific programmatic actions designed to facilitate tribal participation in Departmental program planning and activities.

*****

For more information, please contact:

U.S. Department of Energy
Office of Intergovernmental Affairs
1000 Independence Avenue, SW
Washington, DC 20585
(202) 586-7944

Appendix C

Letter from DOE/NV Notifying Tribes of the Transportation Study

Department of Energy
Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

JUL 25 1996

Distribution

DOE NEVADA OPERATIONS OFFICE (DOE/NV) AMERICAN INDIAN LOW-LEVEL RADIOACTIVE WASTE (LLRW) TRANSPORTATION STUDY

In response to tribal concerns about the lack of American Indian involvement in the transportation study conducted as part of the Nevada Test Site Environmental Impact Statement, DOE/NV is funding a comprehensive LLRW transportation study. We have contracted with Dr. Richard Stoffle, Bureau of Applied Research in Anthropology, at the University of Arizona in Tucson, Arizona, to conduct the study. Your tribe is invited to participate in this study because some of your tribal members currently reside near one of the proposed transportation routes. An American Indian Transportation Committee composed of representatives from Southern Paiutes, Owens Valley Paiutes, Western Shoshones, Goshute, Mohave, Hopi, Navajo, and Las Vegas Indian Center is being assembled to develop a research study design.

Please contact Dr. Stoffle as soon as possible at the below address of your participation in this study:

Dr. Richard Stoffle
Bureau of Applied Research in Anthropology
Anthropology Building 30, Room 317A
Tucson, AZ 85721
Telephone - (520) 621-6282
FAX - (520) 621-9608

If you have any questions or need more information, contact Dr. Stoffle at (520) 621-6282, or Robert C. Furlow, of my staff, at (702) 295-0845. We look forward to your participation in this project.

Kenneth A. Hoar, Director
Environmental Protection Division

EPD:RCF-1461

bcc:
R. W. Stoffle, UofA,
Tucson, AZ
E. F. Di Sanza, ETD, DOE/NV,
Las Vegas, NV

Distribution

Pauline Esteves, Acting Chairperson
Timbisha Shoshone Tribe
Death Valley, CA

Sally Marques, Chairperson
Ely Shoshone Tribe
Ely, NV

James Birchim, Chairperson
Yomba Shoshone Tribe
Austin, NV

Keith Honaker, Chairperson
Duckwater Shoshone Tribe
Duckwater, NV

Rose Marie Bahe, Chairperson
Benton Paiute Tribe
Benton, CA

Allen Summers, Chairperson
Bishop Paiute Tribe
Bishop, CA

Richard Wilder, Chairperson
Fort Independence Paiute Tribe
Independence, CA

Donna Duckey, Chairperson
Big Pine Paiute Tribe
Big Pine, CA

Sandra Yonge, Interim Chairperson
Lone Pine Paiute Tribe
Lone Pine, CA

Daniel Eddy, Chairperson
Colorado River Indian Tribes
Parker, AZ

Alex Shepherd, Chairperson
Paiute Tribe of Southern Utah
Cedar City, UT

Alfreda Mitre, Chairperson
Las Vegas Paiute Tribe
Las Vegas, NV

Rosalyn Mike, Chairperson
Moapa Band of Paiutes
Moapa, NV

Robert Boyt, Chairperson
Las Vegas Indian Center
Las Vegas, NV

Richard Arnold, Chairperson
Pahrump Paiute Tribe
Pahrump, NV

Levi Esquerra, Chairperson
Chemehuevi Paiute Tribe
Chemehuevi Valley, CA

Gloria Benson, Chairperson
Kaibab Paiute Tribe
Fredonia, AZ

Irene Button, Chairperson
Owens Valley Board of Trustees
Lone Pine, CA

Gloria Benson, Chairperson
Southern Paiute Tribal Chairman's Association
Pipe Spring, AZ

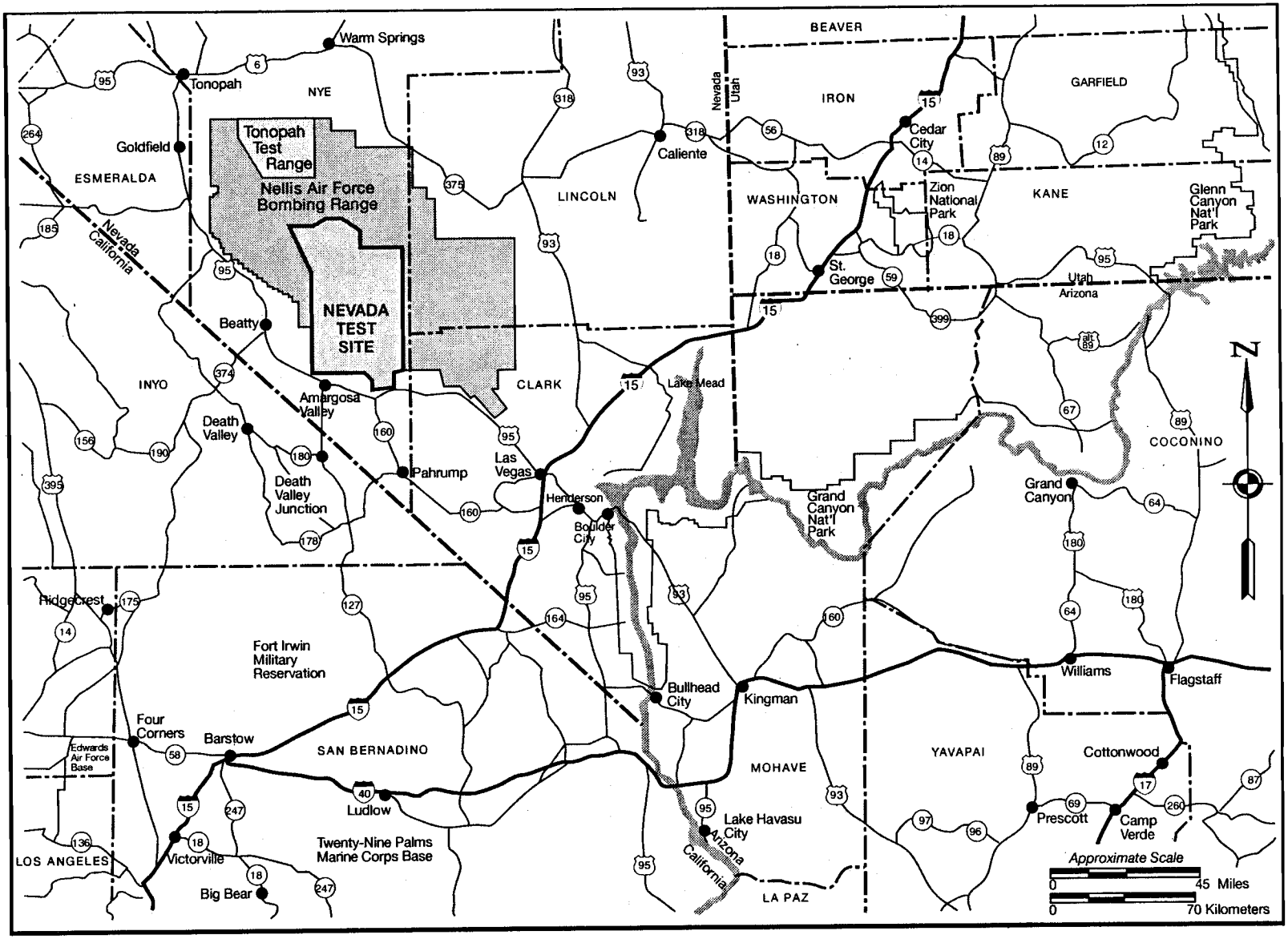
Felix Ike, Chairperson
Te-Mok Tribal Council
Elko, NV

Christine Steele, Chairperson
Goshute Business Council
Ibapah, UT

James Paiva, Chariperson
Duck Valley Shoshone/Paiute Tribes
Owyhee, NV

Appendix D

Material Included in Notebook for Phase One Interviews



Environmental Management

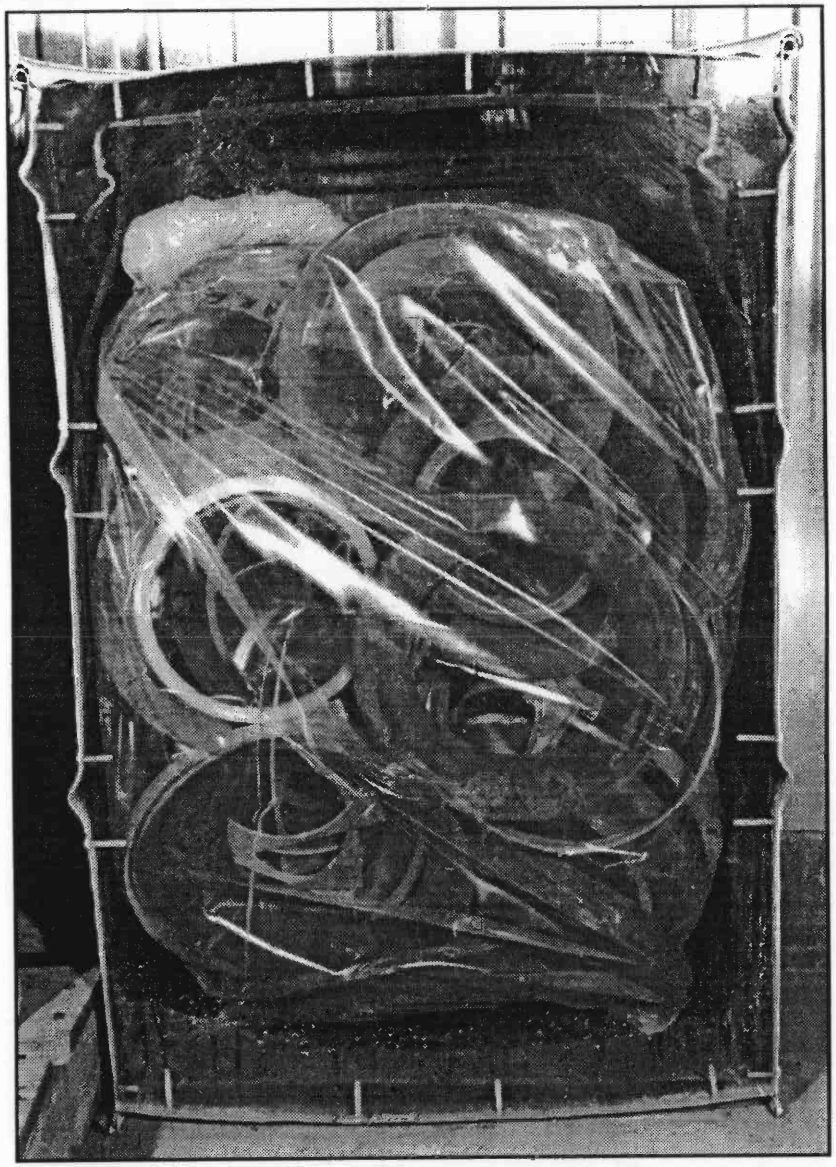
U.S. Department of Energy
Nevada Operations Office

DEM2154.7.A

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.2.A



Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.4.A

Waste shipment arriving at NTS main gate

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.9.A

Environmental Management

U.S. Department of Energy
Nevada Operations Office

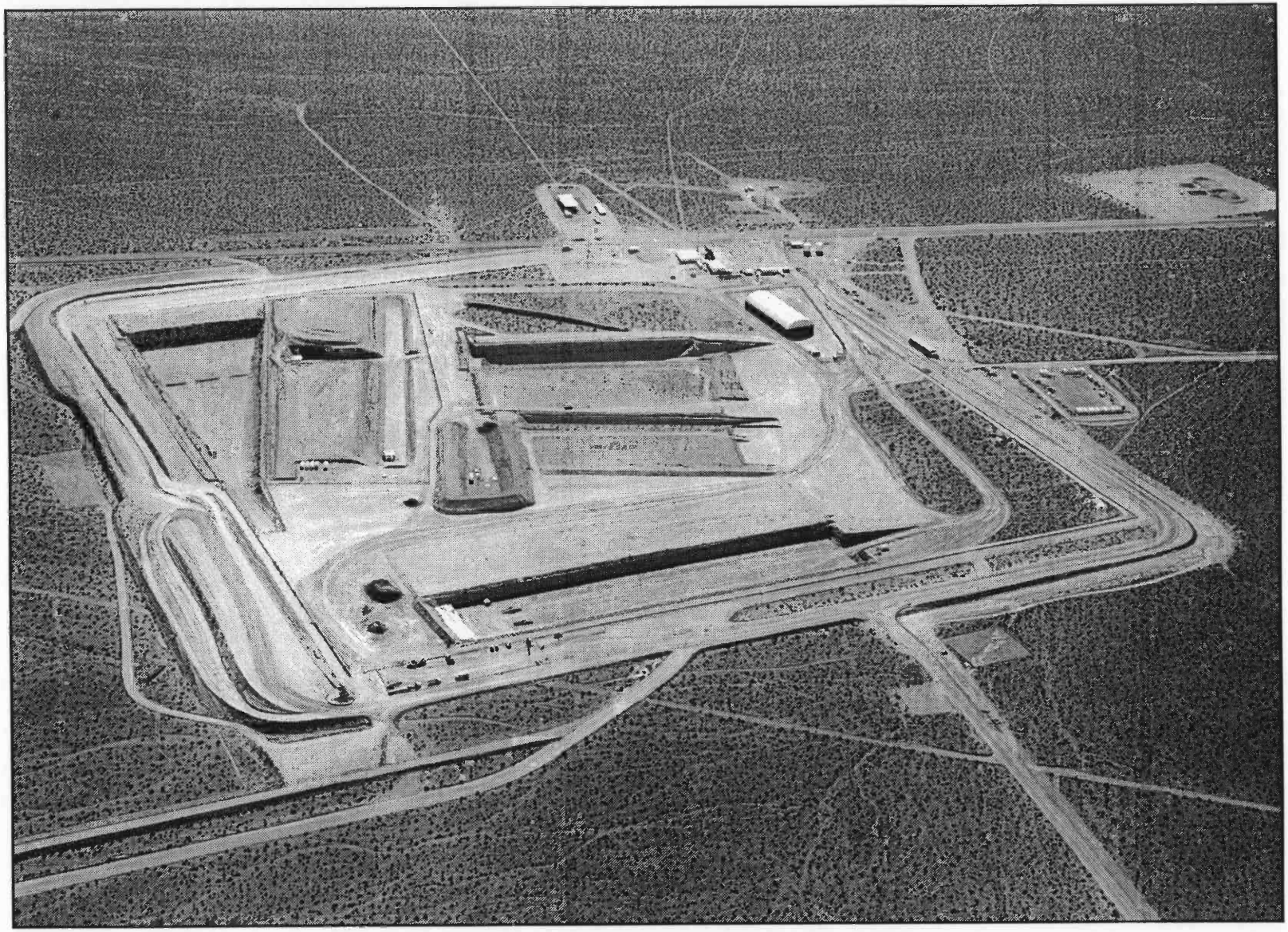
DEM2154.20.A

Waste package being off–loaded in Area 5 trench

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.12.A

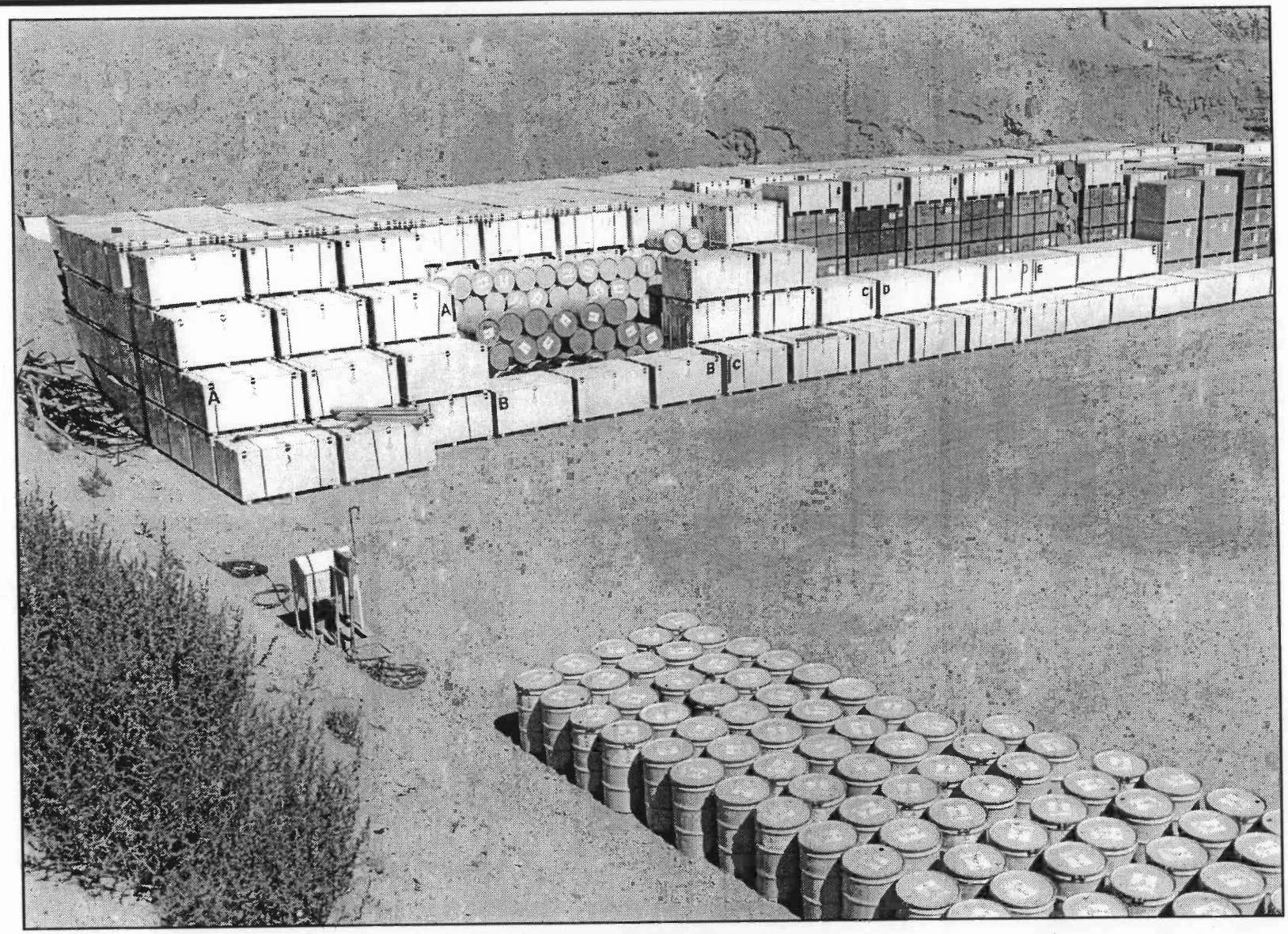


Area 5 Radioactive Waste Management Site

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.10.A

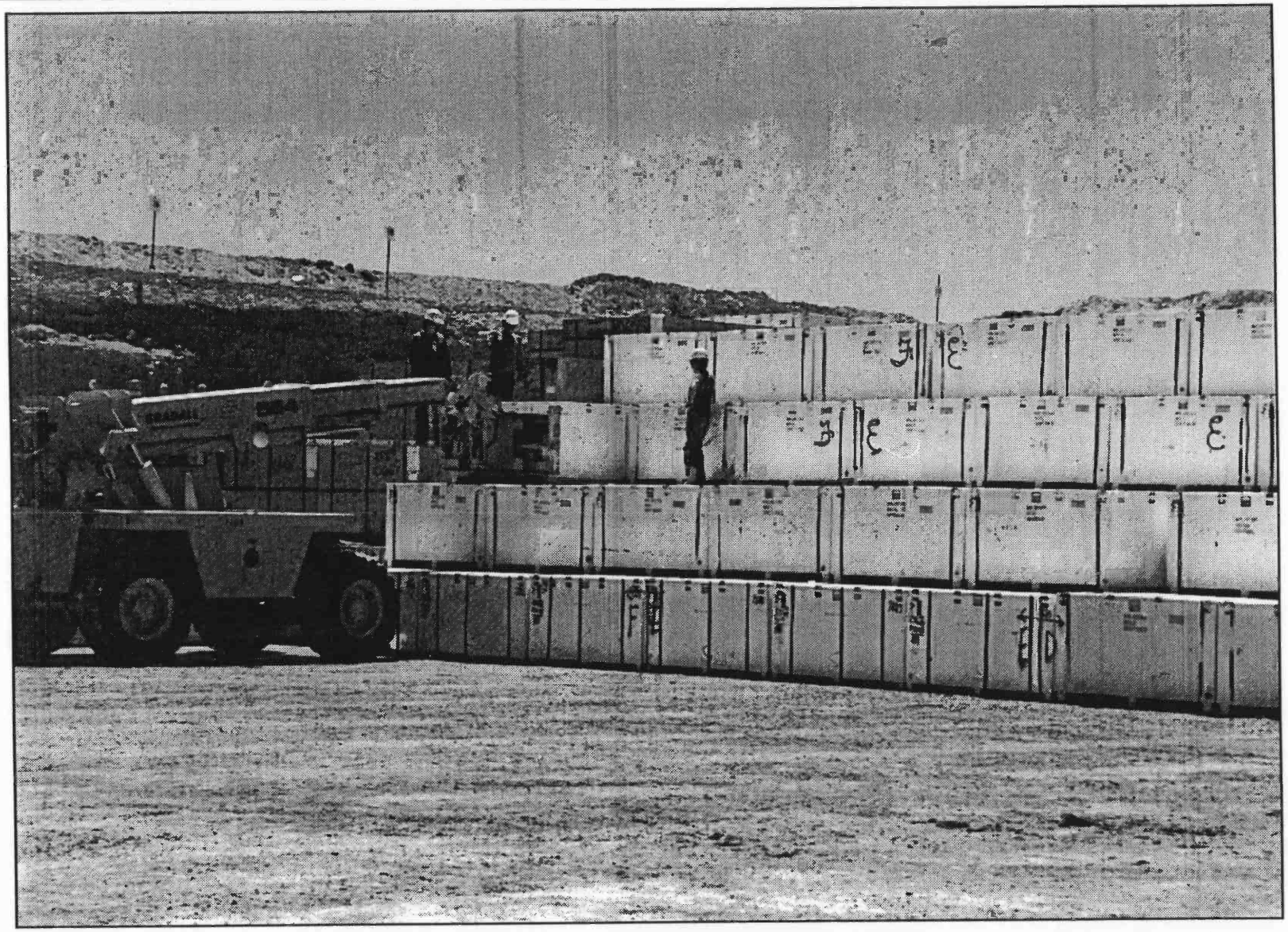


Area 5 Waste Trench

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.11.A



Waste packages are stacked in Area 5 trench

Environmental Management

U.S. Department of Energy
Nevada Operations Office

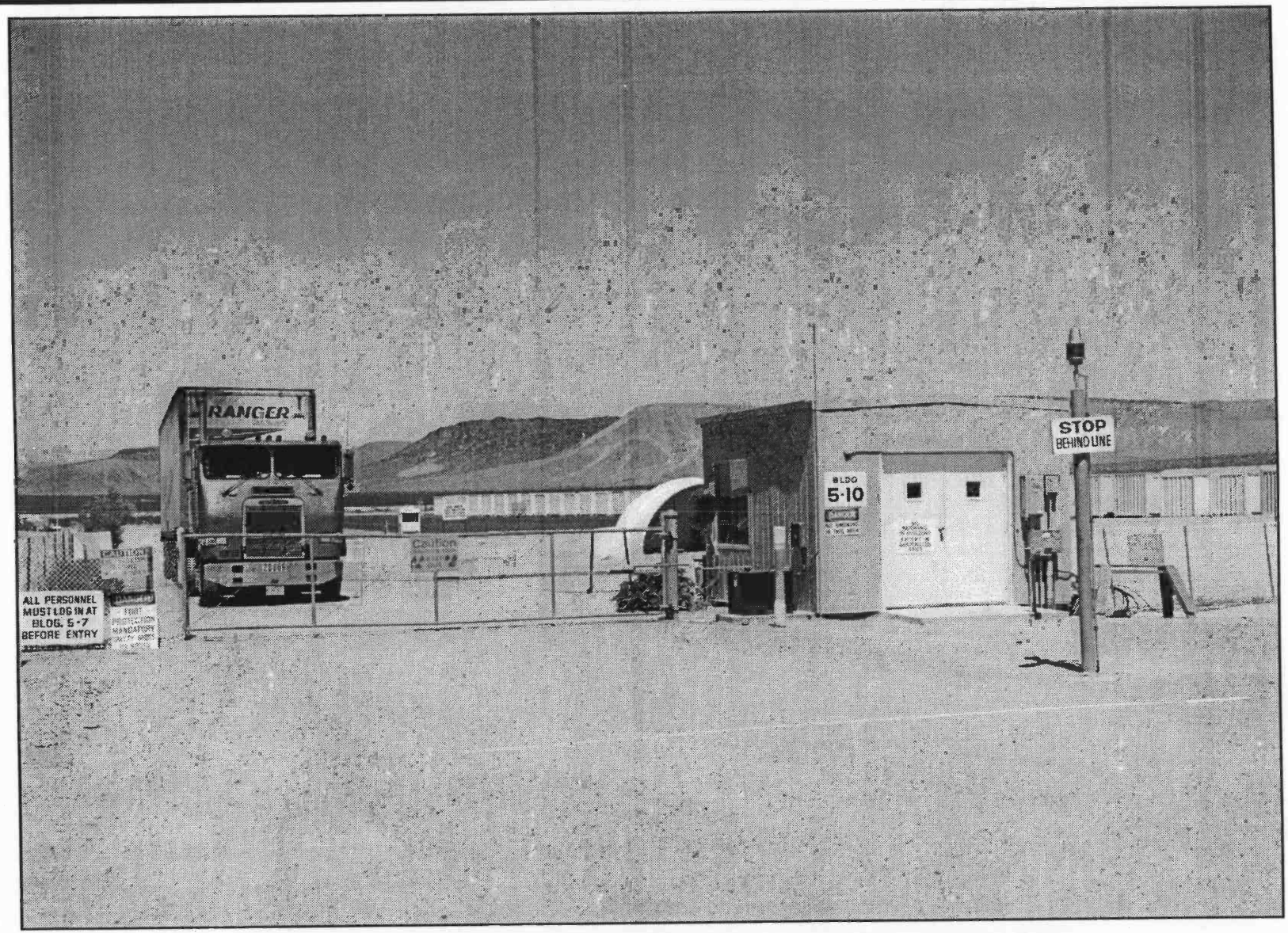
DEM2154.13.A

Area 3 Radioactive Waste Management Site

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.15.A



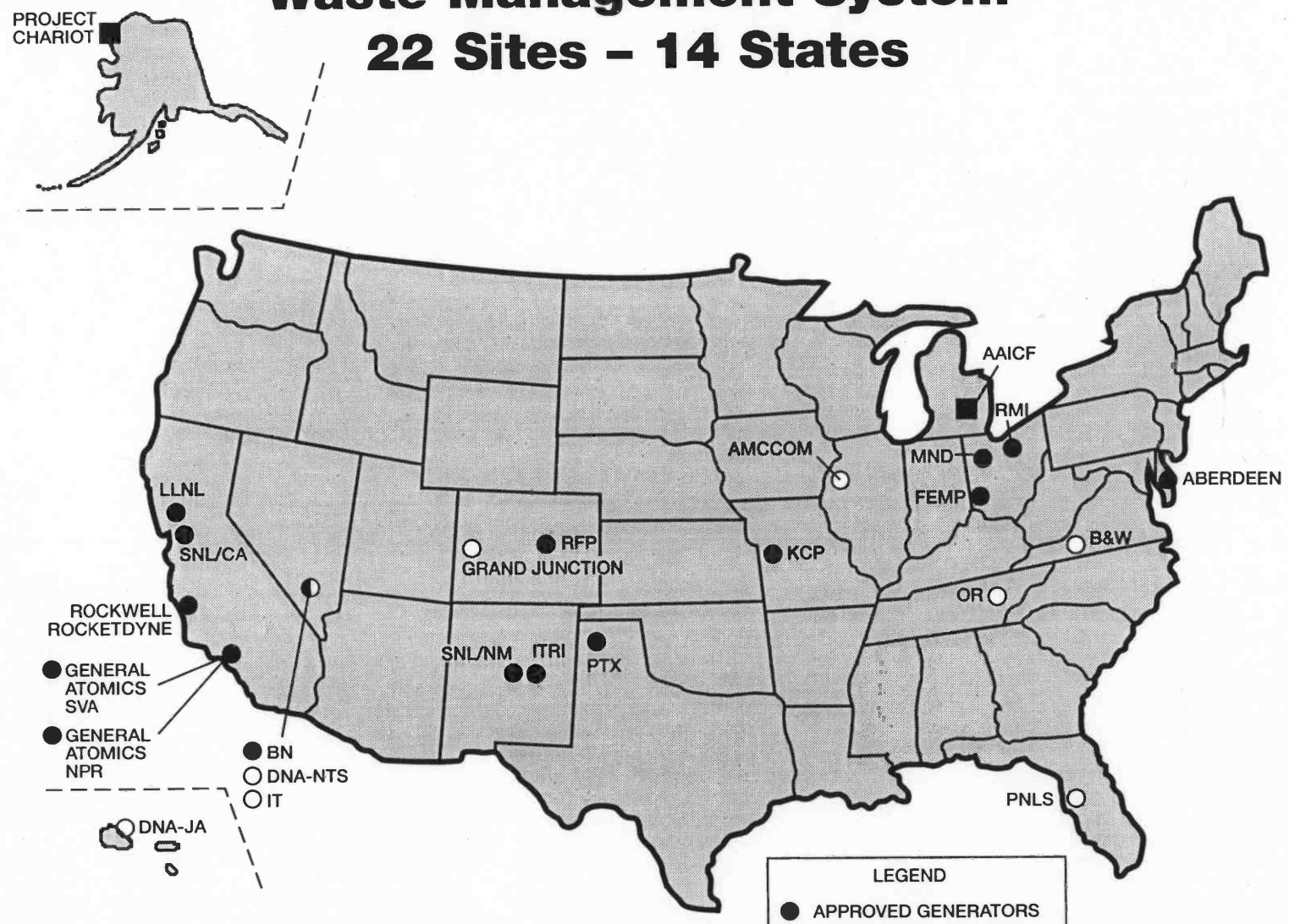
Empty truck departing Area 5 Radioactive Waste Management Site

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.14.A

Waste Management System
22 Sites – 14 States



Environmental Management

U.S. Department of Energy
Nevada Operations Office

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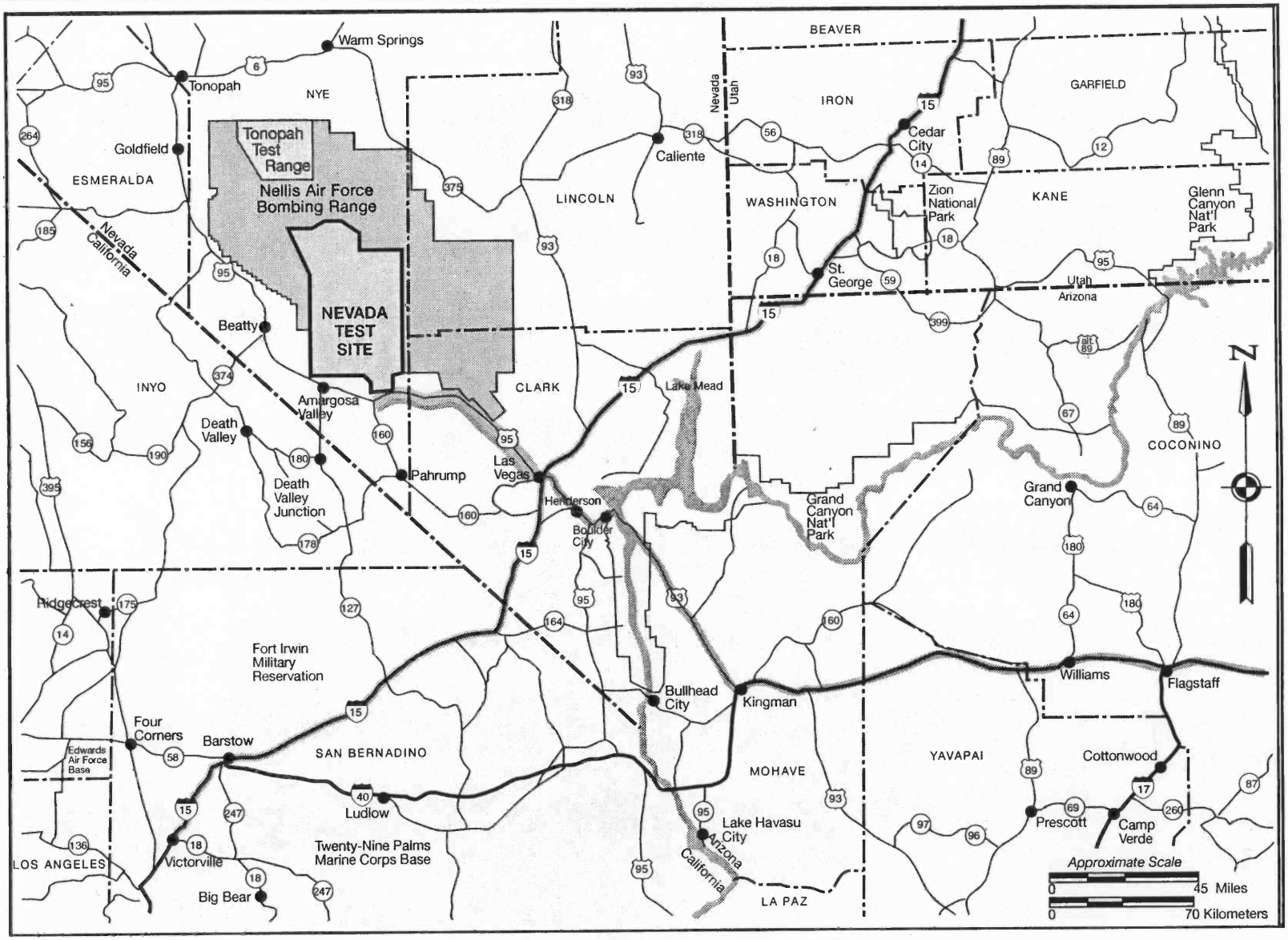

Low-Level Waste Transportation Routes

Environmental Management

U.S. Department of Energy
Nevada Operations Office

DEM2154.8.A

Appendix E

Project Description and Consent Form

Bureau of Applied Research in Anthropology
Department of Anthropology

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

P.O. Box 210030
Tucson, Arizona 85721-0030
Phone: (520) 621-6282
FAX: (520) 621-9608

Department of Energy, Nevada Operations Office
American Indian Low Level Radioactive Waste Transportation Study

The Department of Energy (DOE) is responsible for activities that take place at many places around the United States. At this time, the DOE is considering the increase of its use of the Nevada Test Site (NTS) for storing low level radioactive waste from other places in the United States. The DOE/Nevada Operations office study is sponsoring a study about how American Indians are being or might be affected by the transportation of low level radioactive waste to the NTS. The study is being conducted by researchers from the Bureau of Applied Research in Anthropology at the University of Arizona and members of the American Indian Transportation Committee.

American Indian tribes have been invited to participate in this study if their land is located near or on any of three proposed transportation routes as they pass through or very near the state of Nevada. The project has two goals:

1. Study the social and cultural impacts to Native Americans that are occurring or might occur as a result of transporting low level radioactive waste to the NTS.

2. Offer tribal governments an opportunity to provide information to the DOE/Nevada Operations office regarding the transportation of low level radioactive waste to the NTS.

Tribal governments are being asked to select tribal members who can discuss the perspectives of tribal members regarding the transportation of low level radioactive waste. The project is intended to represent as many different views as possible, including traditional elders and young adults. The information that tribal members provide as part of this study will be combined with what is learned from the other people participating in the study. The results of this study will be written in a report that will be distributed to the participating tribes, the Department of Energy, and persons with an interest in the topic. Tribal members who participate in the study will have the opportunity to review the report before it is finalized. To obtain further information about this study, please contact:

Diane Austin or Richard Stoffle, Bureau of Applied Research in Anthropology,
University of Arizona, Tucson, Arizona 85721; phone: 520-621-6282; fax: 520-621-9608.

BARA

Bureau of Applied Research in Anthropology
Department of Anthropology

THE UNIVERSITY OF
ARIZONA.
TUCSON ARIZONA

Tucson, Arizona 85721

Department of Energy, Nevada Operations Office
American Indian Low Level Radioactive Waste Transportation Study

The Department of Energy (DOE) is responsible for activities that take place at many places around the United States. At this time, the DOE is considering the increase of its use of the Nevada Test Site (NTS) for storing low level radioactive waste from other places in the United States. We are researchers from the Bureau of Applied Research in Anthropology and members of the American Indian Transportation Committee who are conducting this study for the DOE/Nevada Operations Office. This study is about how you, your family, and your tribe are being or might be affected by the transportation of low level radioactive waste to the NTS. The project has two goals:

1. Study the social and cultural impacts to Native Americans that are occurring or might occur as a result of transporting low level radioactive waste to the NTS.

2. Offer tribal governments an opportunity to provide information to the DOE/Nevada Operations office regarding the transportation of low level radioactive waste to the NTS.

The information you provide as part of this study will be combined with what is learned from the other people participating in this study. Your participation will be completely voluntary. In addition, you can determine whether or not you want anyone to know who provided this information to us. The results of this study will be written in a report that will be distributed to the participating tribes, the Department of Energy, and persons with an interest in the topic. You will have the opportunity to review the report before it is finalized. If at any time before you receive the final report you want to talk to one of us about this study, you can contact us at the following office:

Diane Austin, Bureau of Applied Research in Anthropology, University of Arizona
Tucson, Arizona 85721; phone: 520-621-6282; fax: 520-621-9608.

Consent to Participate

I voluntarily agree to participate in the Department of Energy, Nevada Operations Office American Indian Low Level Radioactive Waste Transportation Study. I understand that I will be answering questions and using cards to show what I know and think is important about the existing and possible effects on myself, my family, and my tribe of the transportation of low level radioactive waste to the Nevada Test Site. I understand that what I say will be used in a written report about this study and that my identity (will/ will not) be disclosed. I expect the interview to last approximately two hours. I understand that I am free to stop the interview at any point.

_____ _____

Date Name (please print)

_____

Signature

BARA

Appendix F

Interview Questions

American Indian Low Level Radioactive Waste Transportation Study

Phase One Interview

DATASHEET

Interviewer _____ Interview # _____

Location _____ Date _____

Tape # _____

I. Identification of Roads Used in a Typical Year

Number of Trips per Year

Road Section	Chore	per year	Hunt / Gather	per year	Social	per year	Total

What is the total number of miles you travel in your car/truck in an average year? _____

REPRESENTATIVENESS:

Past:

Future:

Others:

II. Identification of Perceived Impacts from Transportation of Low Level Radioactive Waste

A. Centering on Proposed Routes

1. The proposed route you use most is

Route A Route B Route C

B. Travel Along Proposed Route - Time of Day/Year

1. Is there a certain time of year that you always travel on that road(s), or would you travel on it during every season?

winter	spring	summer	fall
_____	_____	_____	_____

2. Is there a certain time of day that you usually travel on that road(s), or would you travel on them any time of the day or night?

morning (6am-noon)	afternoon (noon-6pm)	evening (6pm-midnight)	overnight (midnight-6am)	all day
_____	_____	_____	_____	

C. Low Level Radioactive Waste Transportation Review

1. Have you ever seen a truck carrying low level radioactive waste?

Yes No Don't Know No Response

2. How often have you seen trucks carrying low level radioactive waste?

D. Identification of Relevant Factors

1. Factors named:

E. Creation of Visual Representation of Factors

F. Analogous Experiences

1. Have any of your experiences in or information about *this area* caused you to include these factors?

Yes No Don't Know No Response

2. List of experiences (write +, -, 0, +/-, or DK by each):

3. Have any of your experiences in or information about *other places* caused you to include these factors?

Yes No Don't Know No Response

4. List of experiences (write +, -, 0, +/-, or DK by each):

5. Why do you consider those experiences positive or negative?

6. Is there anything you would like to add to this arrangement?

Yes No Don't Know No Response

7. List additional factors (write +, -, 0, +/-, or DK by each):

G. Anticipated Behavior Change and Mitigation

1. If the Department of Energy were to choose the (...) route, do you think you would change your behavior in any way?

Yes No Don't Know No Response

2. List changes:

3. Are there any other things that you believe could be done to reduce your concerns?

Yes No Don't Know No Response

4. List mitigation ideas:

5. Would you like your name added to the DOE mailing list regarding this issue?

Yes No Don't Know No Response

III. Demographic Information

1. Ethnic Group

Western Shoshone Southern Paiute Goshute Mohave Other

2. Tribe _____

3. Gender Male Female

4. Age _____

5. Number of people in household for half the year or more _____

6. Number of people in household for less than half the year _____

7. Length of time in present home _____

8. Length of time on reservation/colony/county _____

9. Education completed

< 12 years high school some college 4 year degree technical school graduate degree

10. Primary source(s) of information related to transportation of low level radioactive waste

11. Other knowledgeable people:

12: Additional comments:

Appendix G

Phase One Supplement: Tribal Travel Survey

Tribal Government Sponsored Travel and Other Environmental Threats
Survey of Tribes Participating in the American Indian Low Level Radioactive Waste Transportation Study for the Department of Energy/Nevada Operations Office

Name of Tribe _____ Date _____

Person Completing Form _____ Phone _____

I. Please complete the following table of information regarding travel in tribal government vehicles. Use the additional rows for any other tribal vehicles.

Purpose of Vehicle	Number of Vehicles for this Purpose Operated by Your Tribe	Total Number of Miles Traveled by Vehicles for this Purpose per Year	Total Number of Trips Traveled by Vehicles for this Purpose per Year	Average Number of Individuals in this Vehicle per Trip
Health/CHR van				
Police/Law Enforcement				
School Transportation (buses, vans)				
Senior Program				

II. Please complete the following table of information regarding the change in population within your tribal community:

	1980	**1990**	**1997**
Number of persons living on the reservation/ in the tribal community			
Number of enrolled tribal members			

Appendix H

Phase One Supplement: Environmental Threats Summary Form

III. Please complete the following table of information regarding past, present, and likely future environmental threats to your tribe. These types of activities were identified by tribes during our previous visits. On the next page, please add any other activities that we have not included.

Type of Activity	Past Threat to This Tribe (circle one)		Present Threat to This Tribe (circle one)		Likely Future Threat to This Tribe (circle one)	
Mining or Mining Related	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Hazardous Waste Site (s)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Solid Waste Site (s)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Radioactive Waste Site (s)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Military Activity	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Power Company	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Population Growth in Areas Surrounding Tribal Land	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
Economic Devel. Project(s)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						

In the following boxes, please add any other types of activities that we have not included.

Type of Activity	Past Threat to This Tribe (circle one)		Present Threat to This Tribe (circle one)		Likely Future Threat to This Tribe (circle one)	
(other- please list)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
(other- please list)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
(other- please list)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
(other- please list)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						
(other- please list)	YES	NO	YES	NO	YES	NO
If yes in any box, please describe, including nature of problem and location:						

Appendix I

Fort Mojave Tribal Council Resolution

FORT MOJAVE TRIBAL COUNCIL
RESOLUTION

WHEREAS, the Fort Mojave Indian Tribe of Arizona, California, and Nevada is organized pursuant to the Indian Reorganization Act of 1934, and

WHEREAS, the Fort Mojave Tribal Council is the legal governing body of the Fort Mojave Indian Tribe, organized according to the Constitution and Bylaws of the Fort Mojave Indian Tribe, and

WHEREAS, the Tribal Council of the Fort Mojave Indian Tribe adopted Resolution 95-100 on November 11, 1995, opposing the planning and construction of a nuclear waste dump in the Ward Valley because of the inherent risk of nuclear power plant waste, negative effects of radiation, excessive costs of the nuclear industry, health, safety, and environmental concerns, negative impact on the water supply and water quality, negative impact on tourism and recreational industries, and problems with the transportation, storage, and final disposition of nuclear waste, all of which outweigh the negligible benefits of a nuclear waste dump in the Ward Valley, and

WHEREAS, the people of the Fort Mojave Tribe find the presence of nuclear materials and a nuclear waste dump facility within the Fort Mojave Indian Reservation and within 30 miles on either side of the Colorado River and its tributaries to be in conflict with the maintenance of the Tribe's health, environmental quality, economic well-being, and general welfare, and

WHEREAS, the importation and establishment of a nuclear waste dump in the Ward Valley threatens to bring misery and death and a toxic legacy for the next generation and many generations to come; and

WHEREAS, in many cases, indigenous people have suffered and continue to suffer the most from radiation sickness, immune system difficulties, genetic destruction, cancer, and death due to the development and use of nuclear technologies; and

WHEREAS, over 4,553 local communities in the United States and worldwide, 25 nations, and the regions of the Antarctic, Latin America, and the South Pacific have been declared nuclear free zones; and

WHEREAS, on July 8, 1995, the Indian Tribes of the Lower Colorado River Region, comprising the Fort Mojave, Chemehuevi, Quechan, Cocopah, and Colorado River Indian Tribes, signed a joint resolution directed to Secretary of the

Interior Bruce Babbitt categorically opposing the nuclear waste dump in Ward Valley, on the basis that the dump threatens to contaminate the water supply of the Colorado River; and

WHEREAS, the Tribal Council of the Fort Mojave Indian Tribe concludes that it is in the best interest of the people, land, and resources of the Fort Mojave Indian Tribe that the Tribal lands of the Fort Mojave Reservation be declared a nuclear free zone banning all nuclear activities, including but not limited to uranium mining, uranium milling, fuel wrought assembly, nuclear power plants, nuclear weapons development, deployment, and testing, transporting of radioactive materials, and nuclear waste storage and disposal; and

WHEREAS, the Tribal Council urges the United States Government to use its vast resources in order to develop clean, renewable energy resources in order to create jobs that maintain the traditional Native American values of caretaking and balance with natural creation, rather than promoting nuclear waste dumps in the Colorado River Region which will threaten the health and welfare of all living things within the region;

BE IT RESOLVED, by the Tribal Council of the Fort Mojave Indian Tribe that it hereby declares the Fort Mojave Indian Reservation a nuclear free zone and that all nuclear activities are hereby prohibited and banned from within the exterior boundaries of the Reservation.

CERTIFICATION

We, the undersigned, as the Chairperson and Secretary of the Fort Mojave Tribal Council, do hereby certify that the Fort Mojave Tribal Council is composed of seven (7) members of whom four (4) constituting a quorum were present at a meeting on this 11th day of November, 1995, and that the foregoing resolution was adopted by the affirmative vote of four (4) members.

FORT MOJAVE TRIBAL COUNCIL

Patricia Madueno, Chairperson

Melba Guerrero, Secretary

Appendix J

Legal Review of Tribal Control Over Trucks Carrying LLRW

Appendix J
Legal Review of Tribal Authority to Regulate LLRW Transportation

by Amy Mignella

Tribes' authority to regulate low level radioactive waste transportation is significantly limited by Public Law 103-311 (49 U.S.C.S. § 5101 et seq.), known as the Hazardous Materials Transportation Authorization Act of 1994.

Federal Regulation
The Secretary of Transportation is authorized to include radioactive materials under the definition of hazardous materials as per 49 U.S.C.S. §5103(a). Radioactive materials are defined to include any material having a specific activity greater than 0.002 microcuries/gram. 49 CFR §173.403.

Other regulations restate the same requirements and specifically invoke Department of Transportation rules regarding transport of radioactive materials.

> 10 CFR §71.10 Exemption for low level materials
>
> (a) A licensee is exempt from all requirements of this part with respect to shipment or carriage of a package containing radioactive material having a specific activity not greater than 70 Bq/g (0.002 microCi/g)

All other radioactive materials that are licensed under Nuclear Regulatory Commission rules must conform to transportation requirements outlined in 10 CFR §71.5. Section 71.5 requires that each shipper/licensee follow Department of Transportation Rules regarding transport of the materials and specifically notes that 49 CFR §390-397 must be followed regarding use of public highways.

The Department of Transportation regulations also identify radionuclides in Table 2 of Appendix A to 49 CFR §172.101 (List of Hazardous Substances and Reportable Quantities). As such, even if an NRC license is not required for a specific isotope, DOT regulations may apply. This table provides a list of isotopes with reportable quantities expressed in Curies only; no mass term is provided.

DOT regulations define radioactive materials generally as Class 7 Materials. *See* 49 CFR §172.403.

Transportation of Hazardous Wastes
Transportation of hazardous wastes fall within the Department of Transportation authority as per 49 CFR §§ 171.8 and 172.101. Frequently, wastes are a mixture of non-radioactive hazardous materials and radioactive materials. These "mixed wastes" fall within Department of Transportation jurisdiction even if the radioactivity is less than 0.002 microcuries/gram because they are still hazardous wastes. See 49 CFR § 172.101(c)(9).

Highway Routing

The Tribe is authorized to regulate routing of hazardous materials across Reservation lands by federal statute. *See below.*

> 49 U.S.C.S. §5112(a)(2) Highway Routing of Hazardous Material
> Except with respect to the establishment of dispute resolution protocols, and provisions of §5125(c) of this title, each State and Indian Tribe may establish, maintain, and enforce -
> (A) designations of specific highway routes over which hazardous material may and may not be transported by motor vehicle; and
> (B) limitations and requirements related to highway routing.

Extensive restrictions exist, however. Basically, Tribes cannot enact any restrictions or regulations relating to hazardous materials transportation routing across reservation lands that conflict with federal requirements or impede the successful implementation of those requirements. *See below.*

> Section 5125 of the statute relates to preemption and states that:
>
> § 5125(a)
> "....a requirement of a State, political subdivision of a State, or Indian Tribe is preempted if-
> (1) complying with a requirement of the .... Tribe and a requirement of this chapter or a regulation prescribed under this chapter is not possible; or
> (2) the requirement of the .... Tribe, as applied or enforced, is an obstacle to accomplishing and carrying out this chapter or a regulation prescribed under this chapter."

Furthermore, §5125(b)(1) of the statute designates specific areas where Tribal regulation must be "substantively" the same as the federal requirement. Some examples include transport packaging restrictions, material classification, documentation requirements, and notice provisions. *See below.*

> "... a law, regulation, order, or other requirement of a(n) .... Indian Tribe about any of the following subjects, that is not substantively the same as a provision of this chapter or a regulation prescribed under this chapter is preempted:
> (A) the designation, description, and classification of hazardous material.
> (B) the packing, repacking, handling, labeling, marking and placarding of hazardous material.
> (C) the preparation, execution, and use of shipping documents and use of shipping documents related to hazardous material and requirements related to the umber, contents, and placement of those documents.

(D) the written notification, recording, and reporting of the unintentional release in transportation of hazardous material.
(E) the design, manufacturing, fabricating, marking, maintenance, reconditioning, repairing, or testing of a packaging or a container represented, marked, certified, or sold as qualified for use in transporting hazardous material."

Section 5125(b)(2) adds to this with a limitation regarding what can be enacted by Tribes basically providing that all other regulations or laws enacted must be "substantively the same" as what is written in this law.

Section 5125(c) provides time allowances and restrictions under which Tribal routing regulations must fall. Specifically, two years must pass after the Secretary enacts a routing designation before Tribes can authorize their own restrictions. *See below.*

(1) Except as is provided below in paragraph 2, when two years have passed from the date a regulation is established under § 5112(b) "...a(n) Indian Tribe may establish, maintain or enforce a highway routing designation over which hazardous material may or may not be transported by motor vehicles, or a limitation or requirement related to highway routing, only if the designation, limitation, or requirement complies with § 5112(b).

Some liberties are granted under the statute. Public participation, state, local, and Tribal consultation, and timeliness requirements are not invoked if the Tribe enacts a routing restriction before the Secretary enacts something under §5112(b). *See text and provisions §5112(b)(1)(B), (C), and (F) below.*

(2)
(A)A highway routing designation, limitation, or requirement established before the date a regulation is prescribed under section 5112(b) of this title does not have to comply with section 5112(b)(1)(B), (C), and (F).
(B)This subsection and section 5112 of this title do not require a state or Indian Tribe to comply with section 5112(b)(1)(I) if the highway routing designation, limitation, or requirement was established before November 16, 1990.

Significantly, the Secretary has statutory authority to refrain from objection or penalty regarding a specific Tribal restriction on highway routing until a dispute regarding the designation arises and is resolved. *See below.*

(C)The Secretary may allow a highway routing designation, limitation, or requirement to continue in effect until a dispute related to the designation, limitation, or requirement is resolved under section 5112(d) of this title.

/
/
/

The Tribe can seek a waiver of any preemption rule. The regulation proposed by the Tribe can be protected from preemption by the Secretary of Transportation so long as equivalent assurances of public safety are provided and the rule will not "unreasonably burden" interstate commerce. *See below.*

> § 5125
> (e) A(n) .... Indian Tribe may apply to the Secretary for a waiver of preemption of a requirement ...the Tribe acknowledges is preempted by subsection (a), (b)(1), or (c) of this section. ..... (t)he Secretary may waive the preemption on deciding the requirement -
> (1) provides the public at least as much protection as do requirements of this chapter and regulations prescribed under this chapter (49 USCS §5101 et seq.); and
> (2) is not an unreasonable burden on interstate commerce.

§5112(a) Application
Regulations of this section apply to motor vehicles "transporting hazardous materials in commerce for which placarding is required under this chapter (§§ 5101 et seq.)." The Secretary may expand this designation to other vehicles carrying hazardous materials in commerce, however.

§5112(b) Standards for States and Indian Tribes
(1) The Secretary shall prescribe standards for states and Tribes to use in carrying out subsection (a) above. "...(S)tandards shall include":
(A) A requirement that a routing designation..... shall enhance public safety in the area subject to the jurisdiction of the Tribe and in areas of the United States not subject to the jurisdiction of the ... Tribe and directly affected by the designation.....
(B) minimum procedural requirements to ensure public participation when the ... Indian Tribe is establishing a highway routing designation....
(C)a requirement that, in establishing a highway routing designation, limitation or requirement, a .. Indian Tribe consult with appropriate State, local and Tribal officials having jurisdiction over areas of the United States not subject to the jurisdiction of that State or Tribe establishing the designation.... and with affected industries;
(D) a requirement that a highway routing designation..... of a(n) ... Indian Tribe shall ensure through highway routing for the transportation of hazardous material between adjacent areas;
(E) a requirement that a highway routing designation.... of one ..Indian Tribe affecting the transportation of hazardous material in another State or Tribe may be established, maintained, and enforced by the ...Tribe establishing the designation .... only if-
(i) the designation..... is agreed to by the other State or Tribe within a reasonable period or is approved by the Secretary under subsection (d) of this section; and
(ii) the designation... is not an unreasonable burden on interstate commerce;
(F) a requirement that establishing a highway routing designation .... of a ... Tribe be completed in a timely way;

(G) a requirement that a highway routing designation.... of a(n) ... Indian Tribe provide reasonable routes for motor vehicles transporting hazardous material to reach terminals, facilities for food, fuel, repairs, rest and places to load and unload hazardous material;
/
/
(I) a requirement that in carrying out subsection (a) of this subsection, a(n).. Indian Tribe shall consider -
(i) population densities
(ii) the types of highways;
(iii) the types and amounts of hazardous materials;
(iv) emergency response capabilities;
(v) the results of consulting with affected persons;
(vi) exposure and other risk factors;
(vii) terrain considerations;
(viii) the continuity of routes;
(ix) alternative routes;
(x) the effects on commerce;
(xi) delays in transportation;
(xii) other factors the Secretary considers appropriate.

The Tribes may decide the relative significance of these factors for themselves, however. *See below.*

> (2) The Secretary may not assign a specific weight that a(n)... Indian Tribe shall use when considering the factors under paragraph (1)(I) of this subsection (see above).

The Tribes can obtain the Department of Transportation's list of designated hazardous material routes. *See below.*

> 5112(c)
> In coordination with the States, the Secretary shall update and publish periodically a list of currently effective hazardous material highway route designations.

<u>Requirements for Motor Carriers and Drivers</u>

I have outlined the Department of Transportation provisions with respect to highway routing for both radioactive and hazardous wastes below. For exact wording of each section, see the copies of the regulations provided.

For assessment of compliance with all transport rules, the specific activity (radioactivity) of the material should be evaluated initially. The agency uses this to differentiate between regulatory classes; routing requirements for non-radioactive hazardous wastes outlined below apply to wastes having a "specific activity" less than 0.002 microcuries/gram.

49 CFR § 397.101 Radioactive Materials Routing

(a) Except as provided in section (b) and when only one "practicable" highway route is available, a motor vehicle containing Class 7 radioactive materials must:

operate on routes that minimize radiological risk where risk is assessed based on accident rates, transit time, population density and activities, and time and day of the week when transport will occur; in addition, the driver must know the cargo is Class 7 radioactive cargo and be instructed as to which route to take by the carrier or operator.

(b) Any carrier transporting a controlled quantity of Class 7 radioactive materials (as defined in 49 CFR §173.403 outlined above) shall only drive on preferred routes, defined as Interstate highways, highways for which no alternative route is designated by a "State routing agency", and/or a "State-designated route selected by a State routing agency pursuant to § 397.103 below."

In addition, the carrier or operator must choose routes within the "preferred route" that minimize transit time; urban bypass routes must be chosen unless a "State routing agency has designated an alternative route."

(c) Routes other than preferred routes can only be used when the deviation is necessary to pick up or deliver wastes, for rest, fuel, or repair stops, or because of an exigency that makes the preferred route unsafe. For waste pick up or delivery, the deviation must be the shortest possible route; the driver cannot deviate more than 25 miles and 5x the length of the shortest distance pick up or delivery route. Radiological risks must be minimized in all instances, unless the route is chosen because of emergency circumstances.

(d) The carrier is required to provide written route plans to the driver before departure and to the shipper. Deviations must be reported in writing as amendments within 30 days of occurrence. Route plans must specify origin and destination points, planned stops, departure and arrival time estimates, a route in compliance with these listed requirements, and telephone numbers to be used for emergency assistance.

(e) Public highway routes can only be chosen if the driver has received written training on Class 7 radioactive materials transport requirements, their properties and hazards, and procedures to be followed in the event of an emergency; this training must have occurred within the two preceding years. The driver must also possess a certificate of training verifying the above and a written route plan as required in section (d) above.

Transport of irradiated reactor fuel may only occur in compliance with a plan if required under § 173.22(c) ensuring physical security. Variations from the requirements of this section is allowed for security purposes only as is needed to comply with specifications of such a plan or what is otherwise imposed by the Nuclear Regulatory Commission.

"State(/Tribal)" Routing §397.103

The State or Tribal Routing agency directly affected by any highway routing of hazardous materials must select routes minimizing radiological risk as per "Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials" or an equivalent routing analysis that "adequately" identifies "overall risk to the public." (Copies of the Guidelines document can be obtained from the Office of Highway Safety, Traffic Control Division, Federal Highway Administration.) Before enactment of any such designations, the State or Tribe must obtain a "substantive consultation of affected local jurisdictions and with any other affected States or Tribes to ensure consideration of all impacts and route continuity."

A State or Tribal-designated route is effective when written notice has been provided by certified mail return receipt requested to the Associate Administrator for Safety and System Applications, Federal Highway Administration. Receipt must be provided by the Administrator in writing; a list of State and Tribal-designated routes can be obtained from the same office providing copies of the "Guidelines" document identified above.

Hazardous Materials Routing (NRHM) 49 CFR §397.61 et seq.

Since November 14, 1994, all Tribes have been required to adhere to federal standards for establishing routing requirements for non-radioactive hazardous materials (and wastes).

The applicable federal standards include the following (refer to the requirements attached for exact wording):

- The proposed routing scheme must "enhance public safety" in the areas under Tribal jurisdiction and those outside that will be affected; supporting documentation must be included. Information to be utilized in making such a finding will derive from US DOT Guidelines documents or an "equivalent routing analysis adequately evaluating overall risks to the public" and the following factors: population density estimates, highway types, waste types, emergency response capability assessments, terrain considerations, results of consultations with other officials, effects on commerce, climatic conditions, accident history and congestion levels, alternative routes, continuity achievable, and delay considerations. (Referred to below as "Factors")

- The Tribe must provide public participation opportunities through notice to the public and a 30-day comment period and a decision regarding whether to hold a public hearing must be made in this time frame also. Two newspapers of general circulation in the affected area shall be utilized for notice and such notice shall include a complete description of the route and public meeting time, date, and location. If a public hearing is held, a copy of the transcript, exhibits, and additional documents presented must be made available to the public (duplication costs are allowed as compensation).

- The Tribe must consult with official representatives of any other Tribe, State, or local government that will be affected by the routing designation, including written notice, requesting approval, provided to individuals responsible for highway routing in each affected entity at least 60 days before such designation is established. If no response is received within 60 days from the notice, the Tribe can assume that approval has been given. The Tribe must attempt to resolve objections raised within the 60 day period and must keep a written record of who was given notice and what objections were made, if any.

- The Tribe must ensure "through routing" for every designation established, meaning that "continuity of movement" is ensured, avoiding unnecessary cargo transport delays. Public participation and consultation with representatives of other governments are expected to provide assurances that this is accomplished.

A risk analysis must also be completed using established DOT Guidelines (see above) as well as the Factors listed above. If the risk analysis shows that the proposed routing reduces the risks of the existing scheme by at least 50 percent, then it can be adopted. If the analysis indicates no public safety improvement, it cannot be adopted. If it shows that risks are reduced between 1-49% over the existing scheme, it can be adopted if, in addition, it does not increase the total distance of the trip by more than 25 miles or add more than 25% to the segment of the trip that is altered.

- The Tribe's proposed routing scheme can only be approved if, in addition to that above, the route does not unreasonably burden interstate commerce and the Tribe agrees to adopt the route within 60 days of the receipt of notice by officials consulted as set out above or the routing designation is approved by the Administrator.

-The Tribe must also establish its routing designation within 18 months of providing notice to the public or outside officials regarding the proposal, whichever comes first.

- The Tribe must use the "shortest practicable routes" in providing access to and from designated routes, given considerations of Factors listed above. "Reasonable access for transporters to reach terminals and loading, unloading, pick up and deliver points, as well as facilities for food, fuel, repairs, rest, and safe havens.

- The Tribe must designate an agency to be in charge of the routing designation and ensure that it complies with all federal standards, including public information and reporting requirements set out below.

Information relating to the routing designation must be made available to the public as maps, lists, road signs, or some combination of these. Placement of road signs must adhere to federal provisions outlined in the Federal Highways Administration document titled "Manual on Uniform Traffic Control Devices", especially with respect to hazardous cargo signage.

Disputes regarding routing designations that arise between one or more Tribes or States may be resolved by the Administrator if a petition is filed requesting such action. The

highest level of safety attainable without unreasonable burdens on commerce will be the guiding standard. Petitions must identify the objecting party and party responsible for the designation, certify that notice requirements provided below have been satisfied, detail the nature of the objection as to how it specifically affects the petitioner, describe attempts taken, if any, to resolve the dispute, identify why the Administrator should intervene, and outline what actions the Administrator should take to resolve the matter. Each petitioner must provide notice of the petition to all affected States, political subdivisions, or other Tribes and indicate that 45 days are alloted for a response directed to the Administrator, with a copy provided to the petitioner and a certification that all notice provisions have been observed. The Administrator may arrange a hearing to investigate the matter in the presence of the parties; copies of the final decision will be published in the Federal Register and sent to the parties. Court actions are only permissible after a final decision has been made by the Administrator or until one year has passed from the date the petition is received by the Administrator, whichever comes first. Judicial review of the Administrator's decision can be sought within 90 days of its issuance in an appropriate federal district court.

Standards for Determining Preemption §397.201 et seq.

Tribes can request the Department of Transportation to make a determination of preemption of routing designations of other Tribes, States, and their political subdivisions. Sufficient bases for doing so include those items listed above under § 5125(a); if the requirement at issue is in violation of non-radioactive hazardous cargo routing schemes established under 49 CFR § 397.61 et seq, it will also be preempted.

Tribes can also seek to have preemption of rules waived by the Department of Transportation; this would then allow them even though they contravene some aspect of a requirement outlined within the statute or its regulations. Bases for doing so include those listed above under § 5125(e). Each application must be submitted to the following address:

Administrator
Federal Highways Administration
U.S. Department of Transportation
Washington, DC 20590-0001
Attention: HCC-10 Docket Room, Hazardous Materials Preemption Docket

The application must include a copy of any relevant court order or determination regarding preemption, contain an express statement by the applicant Tribe that the requirement is preempted, specify those provisions that have caused the preemption, state why the substitute provision affords equal or greater protection of public welfare than that existent requirement causing the preemption, state why the substitute provision does not unreasonably burden commerce, and specify what steps are to be taken to administer and effectively enforce the substitute requirement.

Notice of the proposed rule must be provided to any party the Tribe "reasonably ascertains" will be affected by the determination. If the applicant Tribe determines that this will be "impracticable", the applicant must notify those parties whom it is "reasonable" to do so and notify the Administrator regarding the individual or class "description" of those to whom notice was not provided. The Administrator may notice others outside the group identified by the applicant Tribe and may require the applicant to provide notice to additional individuals as well.

The Administrator may investigate the application; he or she may dismiss the application without prejudice if insufficient information is available to make a determination, additional information requested is not submitted, or notice is not provided as specified above.

In determining whether the proposed rule will unreasonably burden interstate commerce, the Administrator will consider the extent to which costs increase and efficiency decreases as a result of the rule, wether the proposed designation has a "rational basis", whether the designation achieves its stated purpose, and how the proposed route will impact any needed uniformity between route designations within the region.

The order issued by the Administrator either granting or rejecting the proposed route designation is subject to reconsideration if a petition for such is filed within 20 days of the order being issued. The petition must contain a statement of the basis for reconsideration, such as material information not previously considered or factual or legal errors that were committed. The petitioner must circulate copies of the petition to each person participating in the application process including a statement that responses to the petition are allowed within 20 days. The decision made by the Administrator with or without a petition for reconsideration becomes the final agency decision. If objections still exist, judicial review in federal district court must be sought.

Cases

Northern States Power Co. v. Prairie Island Mdewakanton Sioux Indian Community , 781 F.Supp 612 (1991) and 991 F.2d 458 (8th Cir., 1993).
Tribal community passed statute attempting to regulate transport of power company's radioactive materials across reservation, the only access direction to the facility. Court holds that Tribal ordinance contains a broader definition of "radioactive material" than that provided in the Hazardous Materials Transportation Act (HTMA) and that the 180-day permit application period and $1000 fee required under the ordinance present substantially greater regulatory burdens that what is provided under the statute. Therefore, the ordinance was held to be void.

* The language in the decision referring to § 1811(c)(1) of the statute is currently numbered § 5125(d)(3) and contains the same provisions. As such, no administrative

action involving the Department of Transportation is necessary; the objecting party can instead proceed directly to a federal district court for resolution of the matter.

In the appeal, the court considered whether Tribal sovereign immunity precludes any suits against the Tribe under the statute; the court disagreed and held that sovereign immunity was only a valid assertion where such authority was not abrogated by the federal government, which it is in this case because of the statute.

Public Service Co. of Colorado v. Shoshone-Bannock Tribes, 30 F.3d 1203 (9th Cir.1994).
The Tribe passed an ordinance excluding shipment of nuclear waste materials across the reservation. PSC brought suit and lost in district court on the grounds that the Tribe had sovereign immunity to regulate truck traffic on the reservation and that the suit should be tried in Tribal Court first; this is the appeal. The court holds that the Tribe's sovereign immunity to regulate trucks is abrogated by the statute and that amendments to the ordinance forbidden truck traffic on the reservation is still preempted by the statute. Because the Tribe is now requiring permits to transport nuclear waste on the reservation, the court holds that it is still a greater regulatory imposition than what is provided under the statute and therefore, it is preempted.