PUBLIC REVIEW DRAFT

ENVIRONMENTAL ASSESSMENT FOR THE SALINE VALLEY RADAR FACILITY PROJECT SALINE VALLEY, CALIFORNIA

September 2003

AIR FORCE FLIGHT TEST CENTER
ENVIRONMENTAL MANAGEMENT
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PRIVACY ADVISORY FOR PUBLIC REVIEW DRAFT EA

Your comments on this Environmental Assessment (EA) are requested. Letters or other written or oral comments provided may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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EXECUTIVE SUMMARY

This environmental assessment (EA) analyzes the potential environmental impacts of a proposed beacon radar facility and an associated microwave repeater in the Saline Valley area in southern California. The proposed project, consisting of five potential alternative beacon radar sites and three repeater site options, are considered in this EA. The final system is expected to consist of a single radar beacon site with associated communications equipment and a single microwave repeater site. The No Action (status quo) alternative is also addressed. The Saline Valley is located in the west-central portion of Inyo County, California, east of Owens Lake. Part of the Saline Valley lies in the western portion of Death Valley National Park. A microwave repeater will be required for any of the five beacon radar facility alternatives.

As the funding agency and proponent for the construction of this project, the Air Force Flight Test Center (AFFTC) is the co-lead (action) agency for the purposes of this *National Environmental Policy Act of 1969* (NEPA) analysis. As landowner of the preferred repeater site, National Park Service (NPS) is considered a co-lead for the assessment of this project. While the Air Force is constructing the project, once completed, the Federal Aviation Administration (FAA) will assume maintenance responsibilities of the facility. The Bureau of Land Management (BLM), FAA, and Timbisha Shoshone Tribe are cooperating/coordinating agencies. The FAA, BLM, and Timbisha Shoshone Tribe will also be involved in subsequent phases of review and evaluation, along with a number of other public trustee agencies and private organizations.

The R-2508 Complex Control Board, a tri-service board (Army, Navy, and Air Force) charged with the day-to-day management of the airspace, determined that radar is needed in the Saline Valley based on the analysis of near-midair collision data. This analysis revealed that this area has a history of aircraft near-midair collisions and a potential for aircraft accidents. The R-2508 Complex Control Board also determined that additional radar coverage would provide ground-based air traffic controllers with accurate real-time information concerning aircraft position and altitude. Finally, the availability of radar coverage in the Saline Valley area would also provide timely aircraft position information and communications for search-and-rescue operations.

In the last 20 years, there have been five recorded incidences of military aircraft crashes and there have been numerous reports (from the DOD flight safety offices) of near-midair collisions; however, some incidences are not officially collected and recorded. Lack of radar was considered a contributing factor in these five crash incidents. The Saline Valley is considered to be one of the most hazardous areas for flight operations in the R-2508 Complex.

There are no current or known near-future programs planned for the R-2508 Complex that would increase DOD aircraft operations above historic levels in the Saline Valley area. The R-2508 Complex predominantly supports the DOD's research, development, testing, and evaluation of military aircraft. The installation of the proposed beacon radar facility meets an existing need for radar coverage within the Saline Valley for control of both civilian use and military operations. Although this radar would support military missions and improve their flying safety, the proposed beacon radar facility would also support other government and civilian aviation operations. Communications capability will include provisions to support both DOD and NPS requirements.

Beacon Radar Alternatives

Alternative A (Central Saline)—This site is located north of the Salt Lake on NPS land and is immediately adjacent to designated NPS wilderness. No significant environmental issues were identified. Of the five alternatives considered, this alternative has the least impact on visual and recreational resources because it is largely shielded from key observation points by existing vegetation. In addition, it has reduced visibility because of its distance from key observation points along Saline Valley Road and the Warm Spring area. However, there are additional construction costs and difficulties associated with this site. Also, while this is the technically preferred alternative for radar (95%) and communication coverage, it would require a Department of Transportation (DOT) 4(f) finding. This finding would require a determination that there are no other feasible and prudent alternatives. A 4(f) finding is required for this alternative because of its location on NPS land. A 4(f) finding is not in itself a significant issue. These types of findings are routinely done throughout the United States when required due to a lack of feasible and prudent options. Section 4(f) restricts the FAA from using public park or recreation lands unless there is no feasible and prudent alternative. Because the site for Alternative A lies within Death Valley National Park and reasonable alternative sites appear to be available, the Air Force has not designated Alternative A as its preferred alternative.

Alternative B (McElvoy Canyon)—This site is located on BLM land immediately west of Saline Valley Road, on an alluvial fan at the mouth of the McElvoy Canyon. No significant environmental issues were identified. Alternative B has been identified as the preferred alternative. This alternative has a moderate impact on visual and recreational resources because of its proximity to the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors and textures compatible with the desert environment. This site has the best radar (85%) and communication coverage of all the BLM alternatives.

Alternative C (Grey Eagle Mine)—This site is located on BLM land west of Saline Valley Road. The existing Grey Eagle Mine is located southwest of the site. No significant environmental issues were identified. This alternative has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be further reduced through design that incorporates colors and textures compatible with the desert environment. This site has adequate radar (80%) and communication coverage.

Alternative D (Keyes Canyon)—This site is located on BLM land west of Saline Valley Road and east of Pat Keyes Canyon, approximately one-quarter mile northeast of Badwater Springs. No significant environmental issues were identified. This alternative has a minor impact on visual and recreational resources because of its proximity to the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors and textures compatible with the desert environment. This site has adequate radar (80%) and communication coverage.

Alternative E (Keyes Canyon North)—This site is located on BLM land west of Saline Valley Road and east of Pat Keyes Canyon, approximately one mile north of Badwater Springs. No significant environmental issues were identified. This alternative has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be further reduced through design that incorporates colors and textures compatible with the desert environment. This site has adequate radar (80%) and communication coverage.

Alternative F (No Action Alternative)—Generally, for construction projects, the environmentally preferred alternative is no action. This typically means the alternative that causes the least damage to the biological and physical environment. However, this alternative does not address the existing life-threatening hazards with respect to ground and air traffic safety.

Microwave Repeater Site Options

All viable microwave repeater sites are located on nonwilderness NPS lands adjacent to existing roads.

Lead Canyon South—This site is on NPS land and is immediately adjacent to Saline Valley Road and designated BLM wilderness. No access route is required to the repeater site. The repeater tower is expected to be from 20 to 40 feet in height, with a 6- by 6- by 6-foot triangular concrete pad. This site has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road (within 50 feet of the centerline), a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors compatible with the desert environment. This site has adequate communications with Keeler Peak, and would require a DOT 4(f) finding.

Lead Canyon North—This site is on NPS land and is immediately adjacent to designated NPS wilderness. No access route is required to the repeater site. The repeater tower is expected to be from 20 to 40 feet in height, with a 6- by 6- by 6-foot triangular concrete pad. This site has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road (within 50 feet of the center line), a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors compatible with the desert environment. This site has adequate communications with Keeler Peak, but would require a DOT 4(f) finding.

Galena Ridge—This site is located on nonwilderness NPS land within the cherry-stemmed area adjacent to a mining road leading to the Santa Rosa Mine and immediately bordering designated NPS wilderness. This site is the preferred microwave repeater alternative. The repeater site is at the end of a rough, four-wheel-drive access road, and the approximately 20-foot tower, with a 6- by 6- by 6-foot triangular concrete pad, would not be visible from the

majority of Saline Valley. Minor site development work would be required for the construction of the tower. The proposed site is located in a heavily disturbed mining area and would require minimal vegetation removal. The access road will not require improvements. Long-term semiannual maintenance for the repeater would be required. This site has a minor impact on visual and recreational resources because of its distance from Saline Valley and any other key observation points. The minor visual and recreational resource impacts would be further reduced through design that incorporates colors compatible with the desert environment. This site has the best communications with Keeler Peak. This site would require a DOT 4(f) finding.

Conclusion

No potentially significant issues have been identified at any of the five alternative beacon radar sites or any of the three repeater sites considered for the proposed project. A careful review of the environmental issues that have been brought forward to date has not identified any potentially significant issues.

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Summary Comparison Table						
Beacon Radar Alternatives						
Attributes	**Alternative A** *Central Saline*	**Alternative B** *McElvoy Canyon*	**Alternative C** *Grey Eagle Mine*	**Alternative D** *Keyes Canyon*	**Alternative E** *Keyes Canyon North*	**Alternative F** *No Action Alternative*
Land Use	Moderate	None	None	None	None	None
Visual/Recreational Resources	Minor	Moderate	Moderate	Minor	Moderate	None
Geology and Soils	Minimal	Minimal	Minimal	Minimal	Minimal	None
Water and Hydrology	None	None	None	None	None	None
Air Quality	Minimal	Minimal	Minimal	Minimal	Minimal	None
Biological Resources	Moderate	Minor	Minor	Minimal	Minor	None
Noise	Minimal	Minimal	Minimal	Minimal	Minimal	None
Cultural Resources	None	None	None	None	None	None
Traffic	Minimal	Minimal	Minimal	Minimal	Minimal	None

Repeater Site Options			
Attributes	**Galena Ridge Repeater Site (NPS)**	**Lead Canyon South Repeater Site (NPS)**	**Lead Canyon North Repeater Site (NPS)**
Land Use	Minimal	Moderate	Moderate
Visual/Recreational Resources	Minor	Moderate	Moderate
Geology and Soils	Minimal	Minimal	Minimal
Water and Hydrology	None	None	None
Air Quality	None	None	None
Biological Resources	Minimal	Minimal	Minimal
Noise	None	None	None
Cultural Resources	None	None	None
Traffic	Minimal	Minimal	Minimal

Notes: Rating scale is used within the attribute table only.

Minimal	Impacts that are not expected to be measurable or are measurable but are too small to cause any change in the environment.
Minor	Potentially adverse impacts that are measurable, but are within the capacity of the impacted system to absorb the change or the impacts can be easily mitigated with little effort and resources so that they are not significant.
Moderate	Potentially adverse impacts that are measurable, but do not violate any laws or regulations and are within the capacity of the impacted system to absorb the change or the impacts, can be mitigated with effort and resources so that they are not significant.
Major	Potentially adverse impacts that individually or cumulatively could be significant.
None	No impacts expected.

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LIST OF ABBREVIATIONS AND ACRONYMS

412 TW/LGQ	Quality Assurance Inspection Branch
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ADCA	Animal Damage Control Act
AFJMAN	Air Force Joint Manual
AFFTC	Air Force Flight Test Center
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AGL	above ground level
AIRFA	American Indian Religious Freedom Act
AMSL	above mean sea level
APE	Area of Potential Effect
ARPA	Archaeological Resources Protection Act
ASR	airport surveillance radar
ATC	authority to construct
AWAC	airborne warning and control system
BACT	best available control technology
BASH	Bird Aircraft Strike Hazard
BEPA	Bald Eagle Protection Act
BHPO	Base Historic Preservation Officer
BLM	Bureau of Land Management
BMP	Best Management Practice
BP	before present
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
Cal-OSHA	California Occupational Safety and Health Administration
CAR	Combat Arms Range
CARB	California Air Resources Board
CCR	California Code of Regulations
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CNPS	California Native Plant Society
CO	carbon monoxide
CRWQCB	California Regional Water Quality Control Board
CWA	Clean Water Act
dB	decibel
dBA	decibel, A-weighted
DNL	day-night average sound level
DOD	Department of Defense
DOT	Department of Transportation
DRU	Direct Reporting Unit
DVNP	Death Valley National Park
E	east
EA	Environmental Assessment
EIR	economic impact region
EIS	Environmental Impact Statement

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

EMR	electromagnetic radiation
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Act
FFCA	Federal Facility Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FOA	Field Operating Agencies
FOD	foreign object damage
FONSI	Finding of No Significant Impact
FS	Forest Service
ft	feet
FWCA	Fish and Wildlife Coordination Act
GBUAPCD	Great Basin Unified Air Pollution Control District
GIS	Geographic Information System
GPS	global positioning system
HAP	Hazardous Air Pollutant
HDGT	heavy-duty gasoline truck
HDDT	heavy-duty diesel truck
HDSC	Hazardous Materials Distribution Support Centers
HMTA	Hazardous Materials Transportation Act
HWMP	Hazardous Waste Management Plan
IAW	in accordance with
ICAO	International Civil Aviation Organization
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IRP	Installation Restoration Program
KCAPCD	Kern County Air Pollution Control District
kW	kilowatt
lb	pound
LDGV	light-duty gasoline vehicle
LDGT	light-duty gasoline truck
LDDT	light-duty diesel truck
Leq	equivalent continuous sound level
MACT	maximum achievable control technology
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District
MFH	Military Family Housing
Misc.	miscellaneous
MOA	military operations area
MOU	Memorandum of Understanding
MSL	mean sea level
MWR	Morale, Welfare, and Recreation
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
NAWS	Naval Air Weapons Station
NEPA	National Environmental Policy Act

LIST OF ABBREVIATIONS AND ACRONYMS (Concluded)

NESHAP	National Emission Standard for Hazardous Air Pollutants
NGR	National Guard Regulation
NHPA	National Historic Preservation Act
NO_x	oxides of nitrogen
NPS	National Park Service
NRCS	Natural Resource Conservation Service
O_3	ozone
ORV	off-road vehicle
OSHA	Occupational Safety and Health Administration
PIRA	Precision Impact Range Area
PL	Public Law
PM10	particulate matter equal to or less than 10 microns
PTO	permit to construct
R	range
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
RFR	radio frequency radiation
S	section
SB	Senate Bill
SCS	Soil Conservation Service
SEA	Significant Ecological Area
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act
SO_x	sulfur oxides
SPRP	Spill Prevention and Response Plan
T	township
TIM	Technical Information Memorandum
TSCA	Toxic Spills Control Act
UCR-EIC	University of California, Riverside-Eastern Information Center
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USDA	United States Department of Agriculture
U.S. EPA	United State Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UXO	unexploded ordnance
VOC	volatile organic compounds
%	percent

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1.0 INTRODUCTION

1.1 Background

The Department of Defense (DOD) has a requirement to safely provide readiness training for military pilots and a safe environment for test and evaluation of aircraft. In the R-2508 Complex this activity uses airspace that is accessible to both military and civil aviation. It has been identified that improved Command and Control Systems (a radar system and associated communications equipment) are needed in the Saline Valley area of the R-2508 Complex to support this mission. This project would provide an added layer of safety to DOD aircrews, other government, and civilian pilots operating in that area. This document describes in detail the options considered, rationale for need, and the process that was followed to select a site and examine impacts on the environment.

The *1994 Desert Protection Act* (16 United States Code [USC] 410aaa) revised the land use in this area by extending the boundaries of the Death Valley National Park. However, the Act maintained the military's use of the airspace as they had under previous rules.

The R-2508 Complex of airspace set aside for military use was first established in the late 1960s, and is jointly managed as a combination of restricted areas, military operations areas, and air traffic control (ATC) assigned airspace. The R-2508 Complex, in its entirety, covers approximately 21,000 square miles. The individual restricted areas that comprise the R-2508 Complex are used by the Air Force, Army, and Navy. These special-purpose restricted areas are separated by airspace through which civilian and other government aircraft are permitted to operate (USAF 1999). In the late seventies the R-2508 Complex radar and communications infrastructure was enhanced by adding six gap filler radar systems and associated communications in remote desert areas. The existing radar installed in the Panamint Valley near Ballarat is typical of the R-2508 Complex radar installations. The installation of a beacon radar in the Saline Valley is a continuation of the DOD's effort to upgrade the R-2508 Complex equipment infrastructure to enhance flying safety for all users in the affected area. The system is expected to be a component of the larger National Airspace System (NAS).

The Saline Valley is remote, and its geomorphology is characterized by varied topography typical of the basin and range physiographic province that comprises this portion of California and neighboring Nevada. The physiography and remoteness of the area contribute to the large expanses that lack the comprehensive radar coverage required to meet the demands for civilian and military flights. Because of the mountainous terrain, general aviation traffic is funneled into areas located adjacent to airspace also used by high-performance military aircraft. These physiographic constraints, coupled with the lack of adequate surveillance facilities within the R-2508 Complex, create conditions for potential aircraft collisions and difficulty locating downed aircraft. The extensive improvements in radar and communications were implemented within the R-2508 Complex during the 1970s to enable aircraft to have real-time data regarding the location of other aircraft operations within the area. The Saline Valley is one of the few remaining areas where comprehensive radar coverage is lacking. The addition of a beacon radar system in the Saline Valley would complement and enhance the existing R-2508 radar mosaic by providing radar coverage and communications in areas presently lacking these capabilities (USAF 1999).

1.2 Lead and Cooperating Agencies

As the funding agency and proponent of the project, the Air Force Flight Test Center (AFFTC) is a co-lead (action) agency for the purposes of this *National Environmental Policy Act of 1969 (NEPA)* analysis. As landowner of the preferred repeater site, National Park Service (NPS) is considered a co-lead for the assessment of this project. The Bureau of Land Management (BLM), Federal Aviation Administration (FAA), and Timbisha Shoshone Tribe are cooperating/coordinating agencies. The FAA, BLM, and Timbisha Shoshone Tribe will also be involved in subsequent phases of review and evaluation, along with a number of other public trustee agencies and private organizations.

1.3 Purpose and Need for the Proposed Project

1.3.1 Purpose for the Proposed Action

This environmental assessment (EA) analyzes the potential environmental impacts of a proposed beacon radar facility and an associated microwave repeater in southern California in the Saline Valley. This EA considers five potential alternative beacon radar sites and the No Action Alternative. A microwave repeater will be required for

any of the beacon radar facility alternative, and three alternative repeater sites are examined. The Air Force proposes to install the Saline Valley Beacon Radar Facility in order to substantially improve ground and flight safety. The Saline Valley is located in the west-central portion of Inyo County, California, east of Owens Lake and in the western portion of Death Valley National Park (DVNP).

While existing policies and aircraft operational procedures have been implemented to minimize the risks of highly dynamic tactical and flight test aircraft operations, radar coverage would provide the next major step in improving flight safety. Once constructed, the proposed beacon radar facility will be maintained and operated by the FAA for both civilian and military aircraft operations. The proposed action is not intended to increase the capacity of the airspace to support flight operations but is rather intended to enable air traffic controllers to handle existing flight operations more safely. If the military proposes increased usage above historic levels, additional NEPA analysis would be required and the public would have an opportunity to review and comment on the usage levels at that time.

The objectives of the AFFTC, with respect to this project, include the following:

- Provide information for air traffic control separation and flight advisories to enable individual military and civilian aircraft to maintain a higher level of flying safety, especially in areas where low-level training routes converge to take tactical advantage of ground terrain;
- Provide communications between aircraft flying at low altitude and control agencies during aircraft emergencies for improved response time and precise location of a potential aircraft accident site;
- Provide enhanced command and control during search-and-rescue operations for downed aircrew, support any such emergency recovery action, and support wildfire suppression efforts in the Saline Valley area;
- Provide radar coverage down to 500 feet aboveground level (AGL) over at least 80% of the Saline Valley and 200 feet AGL at the pass (referred to as the "Gap") that separates the Hunter Mountain Ridge and the Nelson Range; and
- Provide radar coverage, to the extent possible, in the north end of the Saline Valley that is currently shadowed by terrain.

1.3.2 Need for the Proposed Action

The R-2508 Complex Control Board, a tri-service board (Army, Navy, and Air Force) charged with the day-to-day management of the airspace, determined that radar is needed in the Saline Valley based on an analysis of aircraft crash and near-midair collision historical data. A summary of such documented incidents is summarized in Table 1-1. This analysis revealed a continuing history of aircraft near-midair collisions during low-level flight, especially in the area of the Gap.

Table 1-1. Flight Hazard Summary

Date	Aircraft Type	Incident	Location
1982	A-7 (Corsair II)	Crash	Near gap between Saline and Panamint Valley
1983	A-7 (Corsair II)	Crash	North of gap between Saline and Panamint Valley
1985	B-1 (Bomber) F-18 (Tomcat)	Near-midair collision	Near gap between Saline and Panamint Valley
1987	A-4 (Skyhawk)	Crash	West side of Saline Valley
1989	A-7 (Corsair II)	Crash	In Saline Valley floor
1997	F-18 (Hornet) NPS helicopter	Near-midair collision	Saline Valley
1999	AV-8 (Harrier)	Fatal crash	In Saline Valley floor
2001	Unidentified	Near-midair collision (No communications)	Near gap between Saline and Panamint Valley

Note: There have been numerous other reports (from the DOD flight safety offices) of near-midair collision incidents, however, they are not officially collected and recorded.

The flight route through the Saline and Panamint Valleys is a critical part of the integrated low-altitude flight test and training capability of the whole R-2508 complex. It is the only remaining terrain in the northeast portion of the R-2508 Complex that permits tactically realistic low-level training and flight test not overly constrained by some other ground use. This portion of the Complex not only contains unique terrain characteristics not found elsewhere in the area but also is a link in the complete low-level route environment available for low-level training and flight test.

Of particular concern for midair collision potential is the area of the Gap, described in Section 1.3.1, that is a transition route between these valleys. Flying through the area of the Gap allows aircrews to optimize the tactic of radar avoidance using natural terrain-masking techniques by avoiding flight at high points of the ridgeline. Aircraft converge in the Gap because they must fly in a tactically realistic manner to achieve the goals of training and flight testing of various navigation systems employing the important tactic of terrain masking in crossing a ridgeline in this area. The traffic conflicts that occur on a regular basis do so because of the current lack of radar coverage.

The R-2508 Complex Control Board also determined that additional radar coverage would provide ground-based air traffic controllers with accurate, real-time information concerning aircraft position and altitude when aircraft at low altitude experience an emergency which results in loss of the aircraft. In the past, lack of the ability to track aircraft on radar and communicate with them has not only delayed awareness of the accident but made location during search and rescue difficult and time consuming increasing the risk of loss of life for downed aircrew.

Finally, the Board determined availability of radar coverage in the Saline Valley area would provide critical command and control capabilities for any contingency requiring search and rescue operations. This capability would support any such activity whether it resulted from a military aircraft accident, a civilian aircraft emergency, or persons lost or disabled throughout the Saline Valley area. With continued use of the Saline Valley for recreation in the expanded areas of Death Valley National Park such a capability will become even more in demand in the future.

Although this radar would primarily support military missions and improve their flying safety, the proposed beacon radar facility would also support other government and civilian aviation operations. In a letter to the AFFTC Commander dated December 8, 1997, the Superintendent of the Death Valley National Park identified the critical need for improved flight safety in and around the Saline Valley. He identified and recommended "increased/ improved radar coverage of Panamint Valley and Saline Valley" as his number one priority.

There are no current or known near-future programs planned for the R-2508 Complex that would increase DOD aircraft operations above historic levels in the Saline Valley area. While China Lake Naval Air Weapons Station (NAWS) is in the process of publishing a document, *Environmental Impact Statement for Proposed Military Operational Increases and Implementation of Associated Comprehensive Land Use and Integrated Natural Resources Management Plans,* the proposed changes in flight operations are focused on Armitage Airfield and the north and south weapons ranges within the restricted areas R-2505 and R-2524 managed by China Lake NAWS (NAWS and BLM 2002). Any change in the intensity of flight operations within the Saline Valley as a result of increased test and training activity under the China Lake NAWS proposal would be within historic fluctuations of activity levels in the Saline Valley.

The R-2508 Complex predominantly supports the DOD's research, development, testing, and evaluation of military aircraft. In addition, the R-2508 Complex supports readiness training, NASA programs, and the research and development of commercial aircraft. The installation of the proposed beacon radar facility meets an existing need for radar coverage within the Saline Valley for control of both civilian and military operations.

1.4 Project Location

The Saline Valley, located in Inyo County, California, is bordered on the north by the Saline Range, on the west by the Inyo Mountains, on the east by the Last Chance Range, and on the south by the Nelson Range. The Nelson Range separates the Saline Valley from the Panamint Valley, located further south. The Inyo Mountains separate the Saline Valley from the Owens Valley, located to the east. Vehicular access to the Saline Valley is limited to Saline Valley Road, which traverses the entire Saline Valley in a north-to-south orientation (Hunt 1975).

The location of the Saline Valley, in a regional context, is presented in Figure 1-1. The location of the R-2508 Complex is presented in Figure 1-2. The locations of the five alternative beacon radar sites and the microwave repeater sites are indicated in Figure 1-3. More detailed maps indicating the locations of the individual beacon radar sites and the microwave repeater sites are presented in Section 2, Figures 2-3, 2-5, 2-7, 2-9, 2-11, 2-13, 2-15, and 2-17.

The eastern two-thirds of the Saline Valley was incorporated into the Death Valley National Park in 1994 (the Park boundaries generally correspond to Saline Valley Road). However, the *1994 Desert Protection Act* that expanded the Park includes specific language to allow continuation of low-level military overflights, continuation of existing policies applicable to Special Use Airspace or flight training units, and the designation of new units of special airspace or new flight training routes in the expanded units of National Parks or National Wilderness created under the Act (U.S. Senate Bill [SB] 21). The proposed beacon radar sites are located in the Saline Valley in a nonwilderness corridor near Saline Valley Road. One microwave repeater site is located near Galena Peak, south of the Saline Valley in the Nelson Range. The other two sites are next to Saline Valley Road near Lead Canyon. All the repeater sites are in nonwilderness corridors along existing unpaved roads. The majority of the surrounding Saline Valley and the nearby mountains is located in wilderness or other protected areas under the jurisdiction of BLM or NPS.

1.5 Issues and Concerns

1.5.1 Issues and Concerns Studied in Detail

This section discusses the environmental issues evaluated in this EA as well as the environmental issues initially evaluated but subsequently eliminated from further study. The issues studied in detail include the following:

- *Land Use/Socioeconomics*—Potential impact on the continued use of public, private, native, and recreational lands in the Saline Valley; and the safety-related enhancements to existing aircraft operations following installation of the proposed beacon radar.
- *Geology and Soils*—Seismic-related risk and soil erosion impacts associated with project implementation.
- *Water and Hydrology*—Impacts of the proposed project's construction and subsequent operation on local hydrology (both surface water and groundwater) and potential for flooding.
- *Air Quality*—Proposed project's short-term (construction-related) and long-term (operational) air quality impacts and the proposed action's conformity to the *Federal Clean Air Act* (CAA).
- *Biological Resources*—Nature and extent of biological resources within and around the alternative sites, and the proposed project's impacts on these resources.
- *Noise*—Potential noise impacts associated with the proposed project's construction and subsequent operation.
- *Cultural Resources*—Potential to impact cultural resources during construction, and potential long-term impacts upon American Indian resources and/or values.
- *Traffic*—Potential traffic and infrastructure impacts associated with the project.
- *Aesthetics*—Proposed project's potential impact on scenic values.

During the initial planning phases of the proposed action, the R-2508 Complex Engineering Office conducted a site suitability assessment (discussed in Section 2.4) that identified those locations where the impacts would be limited. This EA further analyzed the impacts of the proposed action on those alternative sites that were ultimately considered for further evaluation. The analysis determined that any of the proposed radar beacon sites would meet the mission objectives.

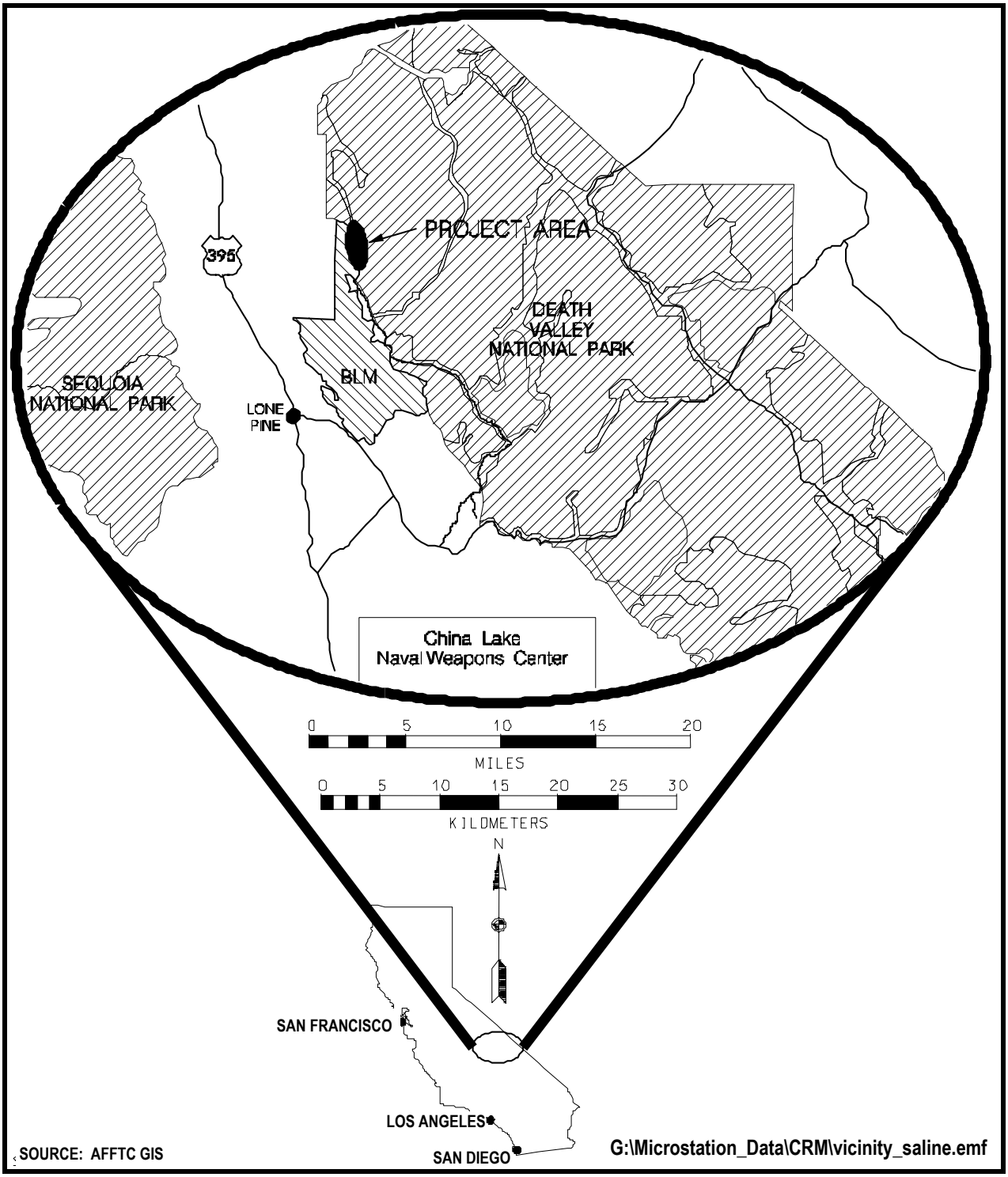


Figure 1-1
General Vicinity Map

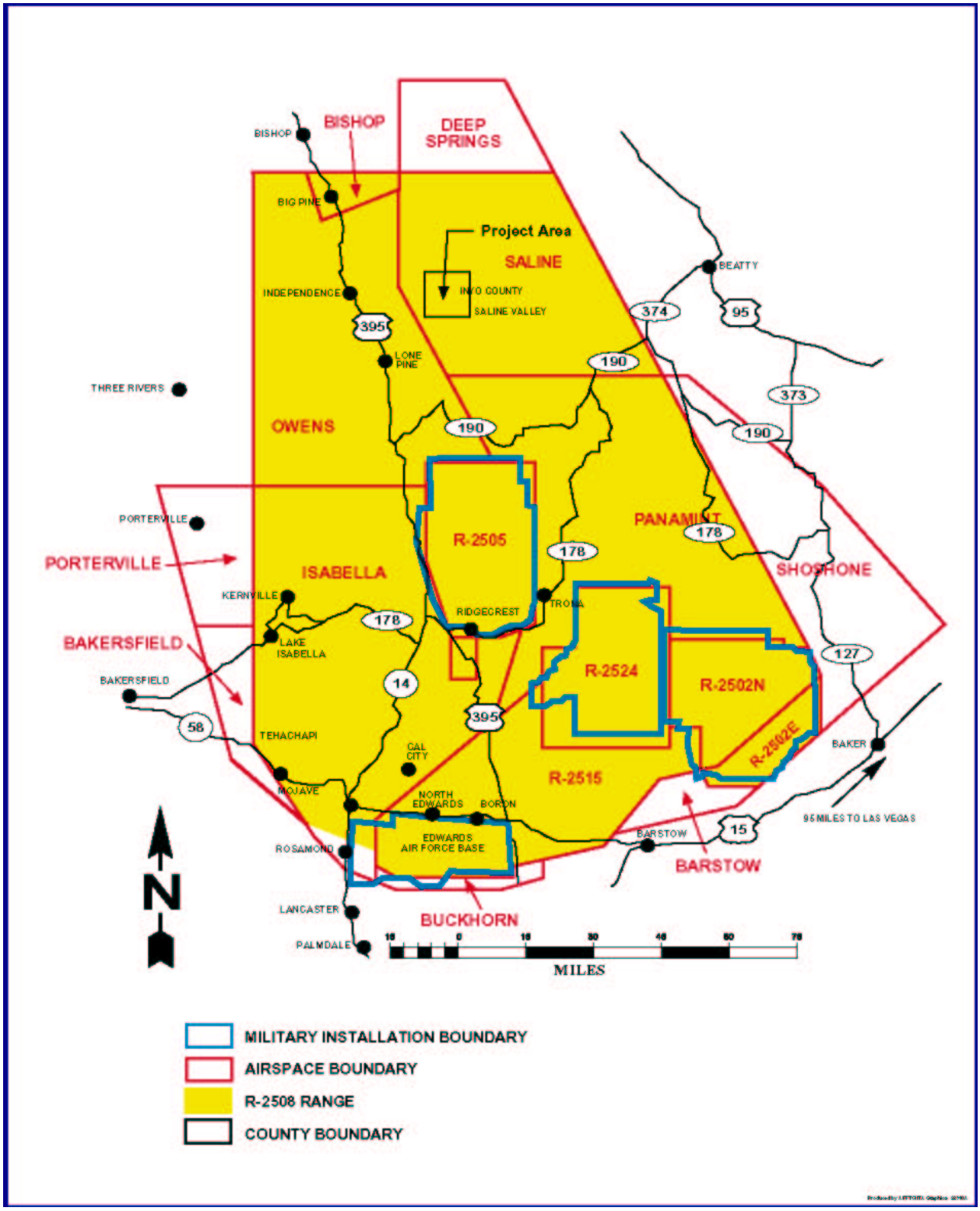


Figure 1-2
Location of R-2508 Complex

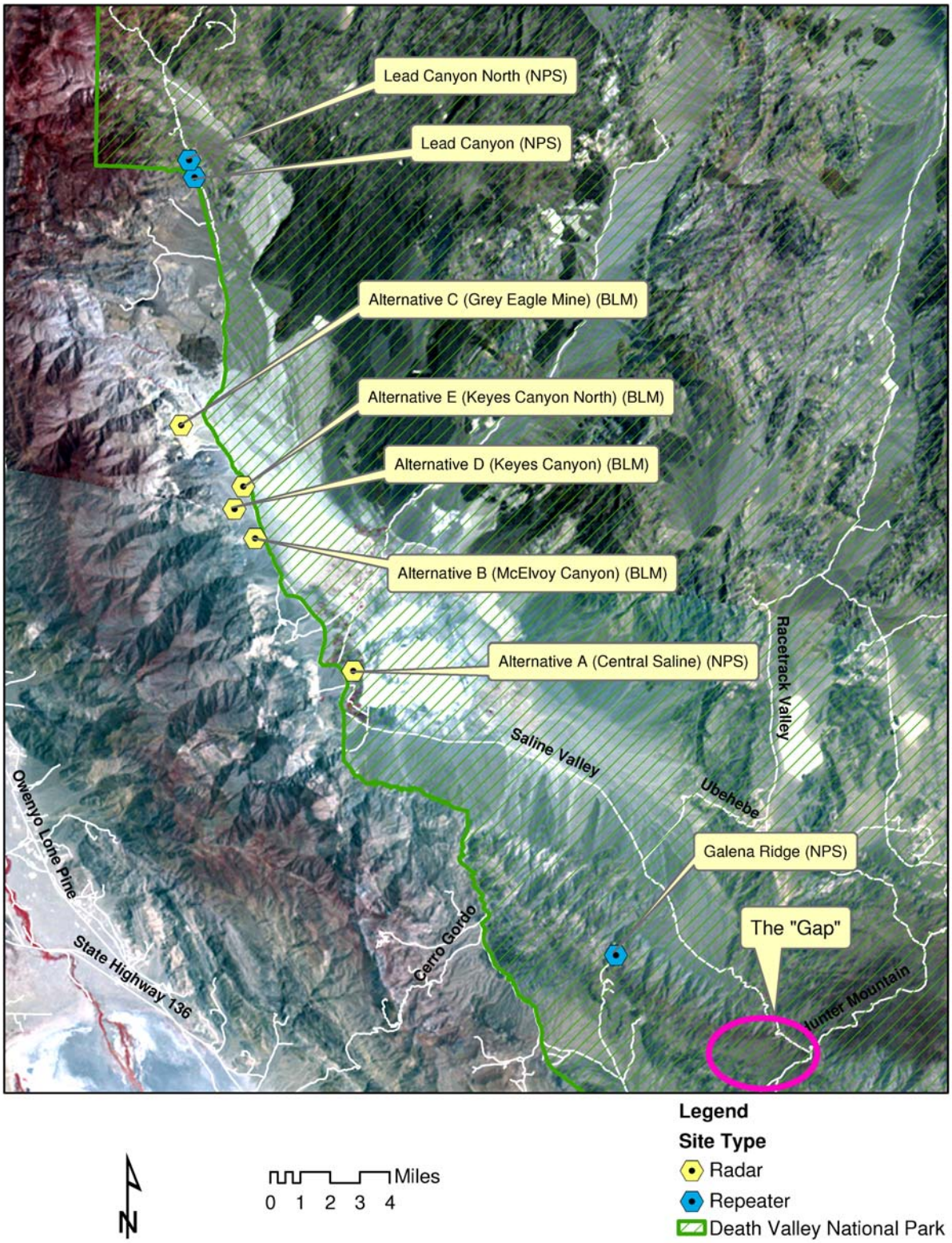


Figure 1-3
Location of Beacon Radar and Repeater Sites

1.5.2 Issues and Concerns Eliminated from Detailed Study

The preliminary environmental analysis determined that the proposed project would *not* affect a number of issues. The issues that would not be adversely impacted by the proposed project include the following:

- *Growth-Inducing Effects*—The proposed beacon radar and microwave repeater facilities would not result in the addition of infrastructure (i.e., roads and utilities) or land use changes that would support additional population growth of any type such as commercial, residential, or industrial. There are no residential uses on or within the vicinity of the alternative sites considered in this analysis.
- *Infrastructure/Energy Resources*—The source of power for the project is proposed to consist of solar-powered generating equipment with a propane-powered generator that will provide back-up power. No utility lines would be extended into the Saline Valley, and, as a result, there would be no environmental impacts related to the extension of power lines.
- *Public/Emergency Services*—The facility would be unmanned (except for infrequent visits for equipment calibration and routine maintenance), and no demands on emergency services are anticipated. Security measures would be incorporated into the project's design as a means to discourage intrusion and vandalism.
- *Occupational Safety and Health*—No potential occupational safety and health risks to the public associated with the facility's long-term operation are anticipated because relatively low power would be generated by the proposed beacon radar facility. Low levels of nonionizing electromagnetic radiation (EMR) would be generated from radio frequency emitters, radar equipment, or radio communication equipment associated with the operation of the beacon radar (estimated to be an average of less than 1 watt with a 100-watt peak), communications or microwave repeater facilities. Unlike primary radar that routinely transmits over a million watts, beacon radar is considered a very low power system. The EMR emissions from this equipment are regulated in accordance with (IAW) Air Force Occupational Safety and Health (AFOSH) Standard 48-9, *Radio Frequency Radiation (RFR) Safety Program* and are estimated to be similar to a citizen band radio. Minimal short-term risks are associated with the installation of the beacon radar and microwave equipment. As with any construction project in the desert portions of southern California, personnel working outdoors may experience heat stress or hypothermia from exposure, or venomous snake or insect bites. First aid equipment, and personnel trained in first aid, will be onsite at all times.
- *Hazardous Materials and Waste*—The beacon radar facility would generate minimal quantities of routine hazardous wastes. The types of hazardous materials likely to be used during construction include acids, corrosives, caustics, glycols, compressed gases, paints and paint thinners, solvents, sealants, adhesives, cements, caulking, fire retardant, and hot asphalt (140ºF or greater). Facility maintenance also requires the use of heating fuels, paints, aerosols, and fluorescent light bulbs, all of which are classified as hazardous materials. These materials would be handled and disposed of in a manner conforming to applicable regulations.
- *Environmental Justice*—Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires Federal agencies to identify and address disproportionately high adverse effects of its activities on minority and low-income populations. There are no known minority or low-income populations in the project area.

1.6 Regulatory Requirements, Permits, and Approvals

1.6.1 Regulatory Requirements

This EA was prepared pursuant to the *National Environmental Policy Act (NEPA) of 1969*. According to *NEPA*, an EA must be prepared for all projects undertaken by Federal agencies, unless they are categorically exempt or have been sufficiently analyzed by an earlier environmental document (Title 40, Code of Federal Regulations [CFR], Part 1501.3). This EA provides the basis for a finding by the Lead Agency that either (1) an Environmental Impact Statement (EIS) is required to address the project and its impacts, or (2) a Finding of No Significant Impact (FONSI) is warranted and no EIS is required. This document is intended to fulfill the requirements for compliance with 40 CFR 1500–1508 and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*. This document has also been prepared to comply with relevant sections of FAA Order 1050.1D, *Policies and*

Procedures for Considering Environmental Impacts; NPS NEPA Director's Order 12, *Conservation Planning and Environmental Analysis and Decision-Making*; and BLM H-1790-1 – *National Environmental Policy Act Handbook.*

A FONSI is deemed appropriate in cases where either there are no significant adverse impacts associated with implementing the project, or the EA provides mitigation measures that avoid or reduce adverse impacts to levels considered not to be significant. In cases where sufficient mitigation of significant impacts cannot be identified without further assessment and/or when extensive public review is warranted due to the controversy or complexity of the project, an EIS may be warranted. The decision to prepare an EIS or a FONSI is based on criteria presented in the Council on Environmental Quality (CEQ) *Regulations for Implementing NEPA* (40 CFR 1502.4) and Department of Interior and the USAF guidelines for NEPA.

The specific requirements for all transportation-related projects that may be located on National Park Service land are found in the *Department of Transportation Act of 1966.* These requirements are listed in the following paragraph.

- *Department of Transportation Act of 1966,* now 49 USC 303—Section 4(f) of this Act establishes the policy of the United States Government that special effort be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation may approve a transportation program or project requiring the use of publicly-owned land of a public park area, wildlife and waterfowl refuge, or land of an historic site of national, state, or local significance (as determined by the Federal, State, or local officials having jurisdiction of the park, recreation area, refuge, or site) only if:
  - There are no feasible and prudent alternatives to using that land, and
  - The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife, and waterfowl refuge, or historic site resulting from the use.

If the proposed radar site is on NPS managed land (Alternative A), or one of the NPS microwave sites is determined to be the only feasible and prudent alternative, a Section 4(f) determination would be addressed and made available for public review. This analysis would be done in close coordination with the NPS and FAA.

1.6.2 Permits and Approvals

The FAA (Western-Pacific Region and FAA Headquarters) will be coordinating closely with the Air Force on this project since they would be involved in the acquisition or leasing of the land required to accommodate the proposed project. The proposed project may require permits and/or other entitlements from the BLM, the NPS, and the Great Basin Unified Air Pollution Control District (GBUAPCD), depending on the site ultimately selected. Approval of the environmental documents, public notification and review, and other land use and development permits must be completed prior to the initiation of any activities. Approvals must be in place before construction begins. Environmental permitting requirements for all work would be coordinated through the AFFTC. However, as permitting requirements change, other permits may be required. The following permits are or may be required.

- *Land Use*—Use permits are required for those sites under the jurisdiction of the appropriate land management agency. The FAA makes the initial Section 4(f) determination and seeks the appropriate land management agency concurrence. The appropriate land management agency would need to make a "Determination of Nonimpairment" if the selected alternative is located within their jurisdiction.
- *Air Quality*—An air quality equipment operations permit for the propane-powered back-up generator is not required from the GBUAPCD in Inyo County for the size propane generator being proposed.
- *Construction*—A permit from the applicable trustee agency may be required for the installation of building support foundations and pylons. In addition, building, grading, and other permits would be required to facilitate the preparation of the development sites and to accommodate the installation of the proposed beacon radar and microwave repeater facilities.

- *Hydrological Resources*—A water quality certification/waiver from the appropriate California Regional Water Quality Control Board (CRWQCB), in compliance with Section 401 of the Federal *Clean Water Act* (CWA) (16 USC 1251 et. seq.), may be required. However, because the area is located in an enclosed basin that does not cross a State line, there is no CWA jurisdiction or permits required and this Act does not apply to the proposed project.

1.7 Related Environmental Documents and Governing Land Use Plans

A number of related environmental documents have been prepared and approved that address activities related to the proposed beacon radar facility. These documents contain information referred to and or used in the preparation of this EA. These documents include the following:

- *Environmental Impact Statement and California Desert Conservation Area Plan Amendments for the Northern and Eastern Mojave Planning Area* (BLM 2002).
- *Timbisha Shoshone Homeland Final Legislative Environmental Impact Statement* (NPS 2001b).
- *Timbisha Shoshone Homeland Act* (Public Law [PL] 106-423 [November 2000], 16 USC 410aaa-75.
- *Death Valley National Park Revised Final Environmental Impact Statement and General Management Plan* (NPS 2001a).
- *California Desert Conservation Area Management Plan, as amended 1980* (BLM 1999).
- *Inyo County General Plan* (February 2001).

A number of other references were consulted during the preparation of this EA. These sources are listed in Section 8.0.

2.0 DESCRIPTION OF PROPOSED ACTION

2.1 Project Characteristics

2.1.1 Beacon Radar Facility Characteristics

This section describes the improvements associated with installation of the proposed beacon radar facility. With the exception of the No Action alternative (Alternative F), all of the activities and or improvements described in this section would be required for the site alternatives (Alternatives A through E) considered in this EA. The primary elements of the beacon radar facility include the following:

- The 35,000-square foot (or smaller, if feasible) site would undergo finished grading, and a gravel surface treatment is proposed. An additional 16,000 square feet is expected to be required for the staging of construction equipment. Concrete footings, slabs, and or pylons for the aboveground improvements would be poured and finished. Preliminary analysis indicates that an area of up to 9,000 square feet would be required to accommodate the solar panels. Conceptual site plans for the beacon radar are presented in Figures 2-1 and 2-2.
- Under the proposed design, the site footprint (35,000 square feet) would include three buildings, radar antenna tower, communications antenna tower, propane tank, and the 9,000-square foot solar panel field. Structures will be designed to meet the requirements of Seismic Zone 4.
- A 16- by 24-foot modular, prefabricated metal structure housing the radar, communications, and microwave components would be installed at the site (Figure 2-1). Communications equipment will include provisions to support both DOD and NPS requirements. A portable chemical toilet facility, attached to this building, would be required.
- A second, 180-square foot modular building would be needed for the planned 75-kilowatt (kW) propane-powered standby power plant generator.
- A third modular building with an estimated floor area of 500 square foot would be required to house the storage batteries and solar control equipment.
- An electric transformer would be needed on a pad located within the site. All power connections onsite would be placed underground. No offsite utilities, extensions, or connections are required.
- A 1,000-gallon aboveground propane fuel tank with service line connections to the auxiliary generators would be required.
- The beacon radar antenna tower (Figures 2-1 and 2-2), with a footprint of 24 feet on a side, would be assembled onsite near the electronics building. The antenna tower would have a maximum height of 50 feet to the top of the antenna or radome. Obstruction clearance lighting for the antenna tower would not be required.
- A pole-mounted communication antenna tower of approximately 10 feet high would be required.
- An 8-foot chain-link perimeter fence with intrusion monitors is proposed. Security monitors connected to a monitoring station may also be provided. Facility exterior lighting would consist of motion-activated lighting for security or required lighting during maintenance activities. The security system would be designed to correspond to a “three-level disturbance,” virtually eliminating false alarms caused by windblown objects and small animals.
- The 9,000-square foot nonreflective matte-black solar collector array is proposed to be located on site. A typical set of collector modules would be oriented in an east-west row approximately 130 feet long, 15 feet wide (horizontal), and tilted 36 degrees from the horizon, facing south with a maximum height of 15 feet. The collector rows would be located approximately 12 feet apart to prevent the creation of shadows on the adjacent collectors (Figures 2-1 and 2-2).
- Conventional air conditioning units would provide building cooling.
- The proposed structures and other improvements must be elevated, leveled, and graded in a manner that permits stormwater runoff to be conveyed offsite. A buffer area, sloped away from the site, would be

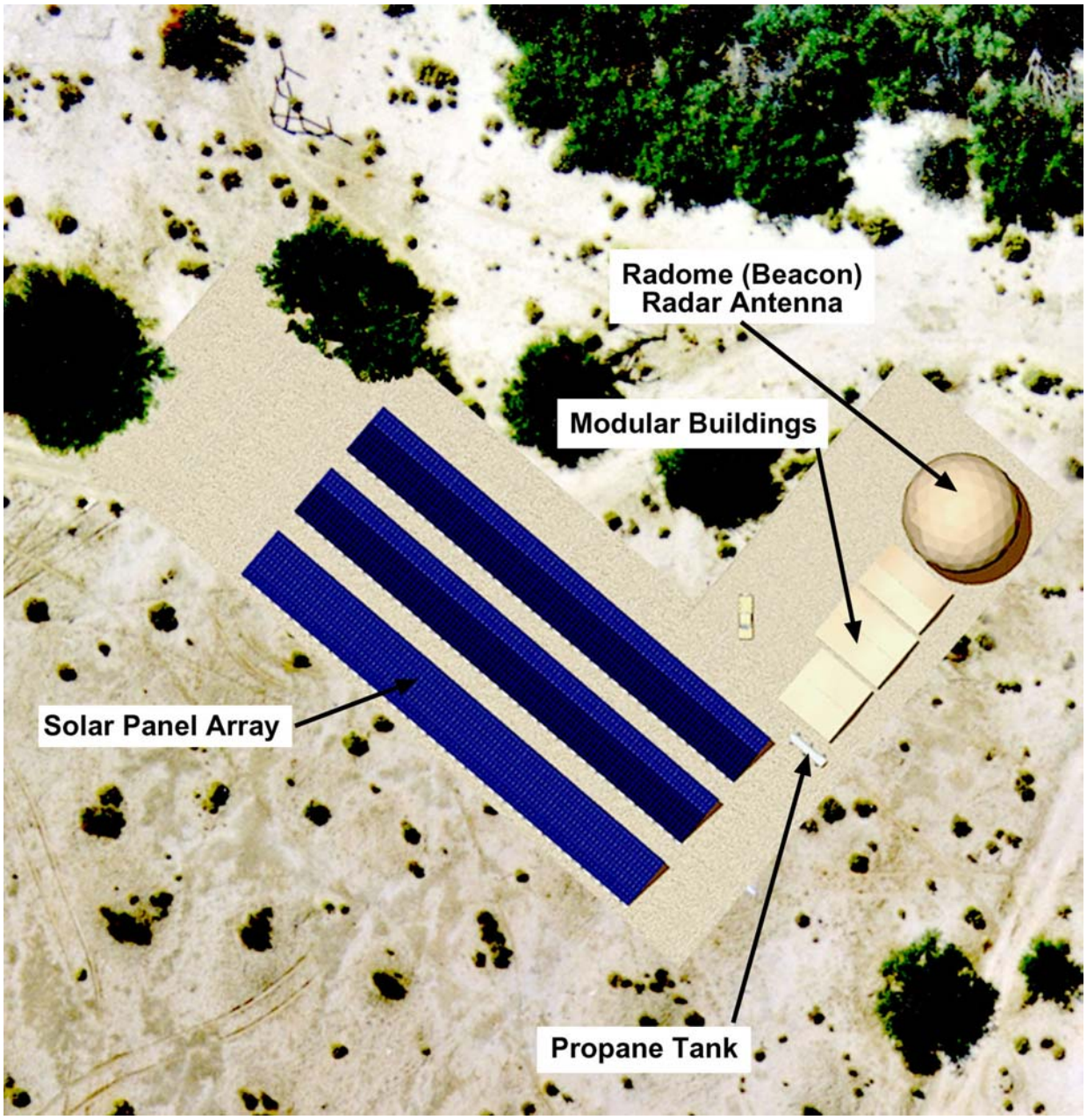


Figure 2-1
Conceptual Site Plan – Beacon Radar

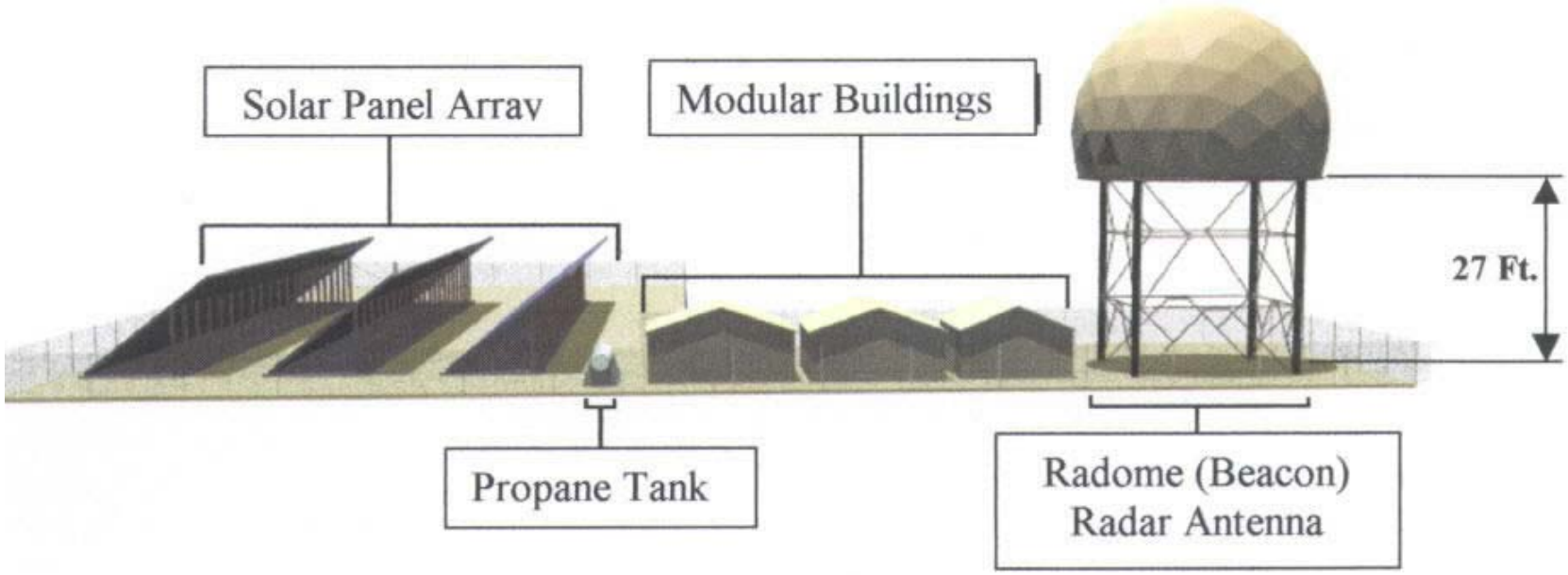


Figure 2-2
Conceptual Elevation – Beacon Radar

required. Pylons (the concrete structure supporting the radar tower and solar array) and foundations would be used to elevate the proposed improvements.

- The site's soils must undergo a limited level of compaction to permit the installation of improvements, footings for the antenna tower, parking area, and the driveway. Compaction and import of fill material would be minimized by the use of antenna pylons. For a typical site, approximately 80 cubic yards of earth would be removed as part of the excavation required for the foundations and support pylons. This material would be spread over the site. In addition, approximately 330 cubic yards of aggregate would be needed to cover and elevate the site. Limited quantities of earth/aggregate may be required for the access routes.
- Limited, remote automatic weather equipment, which would measure wind, rainfall, barometric pressure, and temperature, would be included.
- Automated fire suppression systems would be installed where appropriate.
- The topography in the buffer area may require limited modification to facilitate drainage away from the site.
- The proposed facility, while unmanned, would be operational during daylight hours.
- The site characteristics discussed in this section may be configured to lessen potential impacts.

Access from some sites (Alternatives A, C, and D) to the main Saline Valley Road would be over existing unimproved routes. Sites without existing access roads would require minimal grading at contour to provide access for construction and maintenance. The access roadway must have sufficient width to accommodate construction and transport equipment. Access to Alternatives B and E would require an access route from Saline Valley Road across a narrow strip of NPS-managed land. The aggregate needed for site improvements would be taken from agency-approved borrow sources in the Saline Valley.

The final system is expected to consist of a single radar beacon site with associated communications equipment and a single microwave repeater site. Communications equipment will include provisions to support both DOD and NPS requirements. Explanatory plaques, similar to those that explain roadside historical sites, will be installed near the gate entrance to the beacon and repeater facilities. Information on the plaques will include the purpose of the facilities. Key elements of the proposed microwave repeater for either Galena Ridge or Lead Canyon are discussed in Section 2.3.4.

2.1.2 Microwave Repeater Characteristics

The microwave repeater facility would consist of one 20- to 40-foot-high, steel tower with a triangular base (approximately 6 feet on one side) to support the microwave antennas, electronics equipment, storage battery, and one 10-square foot solar panel. The repeater would be situated within a 12- by 12-foot plot. An 8-foot-high perimeter fence with an entry gate would surround the tower. Security lighting would be designed so that it is activated only after a multilevel disturbance has occurred, eliminating nuisance alarms. The tower, fences, and equipment shelter would use color and texture schemes designed to blend into the local surroundings

The microwave repeater would communicate with a microwave terminal located at an existing FAA communications site on Keeler Peak. The Keeler Peak site would need to be upgraded to include an additional microwave antenna dish, 6 feet in diameter, on an existing tower and microwave radio equipment. No facility expansion is planned.

2.2 Criteria Considered

2.2.1 Operational Criteria

All five beacon radar facility alternatives (Alternatives A through E) meet the applicable air traffic control (civilian and military) operational criteria that are similar to other R-2508 Complex radar systems. A number of candidate beacon radar sites considered early in the project's planning phase were eliminated from further consideration because they failed to meet the key operational requirements in the following list.

- The beacon radar facility must provide a direct "line-of-sight" for the radar coverage over 80% of the Saline Valley at altitudes of 500 feet AGL. The minimum coverage is consistent with the measured coverage of similar R-2508 Complex radar systems sited in other desert valleys.
- The beacon radar facility must provide radar coverage in the Gap area (the Gap separates the Hunter Mountain Ridge and the Nelson Range located in the southeastern portion of the Saline Valley) at altitudes of 200 feet AGL. The Gap historically is a high-risk area for near-midair collisions.
- All five beacon radar alternatives would require the use of a microwave repeater to maintain a direct line-of-sight for data transmission between the FAA complex located on Keeler Peak and the proposed beacon radar facility located on the Saline Valley floor. Keeler Peak is the only developed peak in the vicinity that has line-of-sight capabilities to the Saline Valley.
- The beacon radar site must be able to communicate with FAA's Keeler Peak microwave communication facility with not more than one repeater station.

2.2.2 Selection Criteria

The selection criteria were based on avoidance of impacts to regulatory requirements, visual and recreational resources, biological resources, air resources, solid and hazardous materials and waste, physical resources, and socioeconomic resources.

2.2.2.1 Regulatory Requirements

Any aspect of the proposed action that would threaten to violate Federal, State, or local law or requirements imposed for the protection of the environment.

2.2.2.2 Visual and Recreational Resources

Any aspect of the proposed action that would:

- Significantly distract from the visual and recreational quality of the scenery.
- Significantly distract from the overall recreational experience.
- Result in the installation of new equipment inside the Park.
- Duplicate existing radar and communications capabilities.
- Conflict with the basic elements of form, line, color, and texture.

2.2.2.3 Biological Resources

Any aspect of the proposed action that would:

- Substantially conflict with special natural communities by reducing a wildlife population below self-sustaining levels.
- Cause direct or indirect impacts on individuals or populations of wildlife species listed or proposed for listing as threatened or endangered under Federal or State Endangered Species Act.

2.2.2.4 Air Resources

Any aspect of the proposed action that would:

- Violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation, or exposure.
- Expose sensitive receptors to substantial pollution concentrations.
- Conflict with the *Federal Clean Air Act* (CAA), as amended, or other Federal, State, or local air quality plans or requirements.
- Conflict with the California State Implementation Plan.

2.2.2.5 Solid and Hazardous Materials and Wastes

Any aspect of the proposed action that would substantially:

- Increase the use of hazardous materials above local or regional historic levels.
- Increase the use, production, disposal of solid and hazardous wastes, or hazardous materials that pose a hazard to people, wildlife, or plant populations in the area affected.
- Increase the generation of hazardous substances that will require disposal at local or regional facilities.

2.2.2.6. Physical Resources

Any aspect of the proposed action that would substantially:

- Degrade a unique geologic feature.
- Decrease soil permeability; increase surface water runoff, and wind or water-induced soil erosion above historic levels.
- Cause an increase in landscape instability or landslides through topographical or slope alterations.
- Increase public exposure to danger from seismic activity.
- Create noise levels incompatible with existing or proposed land use.

2.2.2.7 Socioeconomic Resources

Any aspect of the proposed action that would substantially:

- Create a need for additions to law enforcement, fire protection, and medical emergency medical services, staff, or equipment to maintain acceptable service rates.
- Require additional capacity or resources to provide services or utilities to the proposed project.
- Generate traffic that would require expansion of existing roadways.

2.3 Alternatives Selection Process

The initial review of the Saline Valley area was a two-step process that considered a total of 22 candidate sites identified for the proposed beacon radar facility. Five of these sites emerged as being the most suitable candidates as a result of field site surveys and computer modeling of radar coverage. The five alternative beacon radar sites are Alternative A (the Central Saline site), Alternative B (the McElvoy Canyon site) Alternative C (the Grey Eagle Mine site), Alternative D (the Keyes Canyon site), and Alternative E (the Keyes Canyon North site). The names of the five sites reflect significant geographical features located in the vicinity of each site. All of the beacon radar alternative sites are located within nonwilderness areas. Prior to the selection of the five beacon radar alternatives that were evaluated in this EA, seven other high-elevation sites located along the south and west rim of the Saline Valley, within nonwilderness areas, were eliminated from further consideration because of unacceptable radar coverage.

Beacon radar at any of the five alternative sites would require the use of a microwave repeater to provide data transmission between the beacon radar alternative site ultimately selected and the Keeler Peak FAA complex. Keeler Peak is an existing FAA communications complex that would require only a minor upgrading of communications equipment to support the Saline Valley radar and communication requirements. Impacts associated with the installation of the microwave repeater were considered for each of the five beacon radar alternatives. The proposed repeater sites are also located outside of designated wilderness areas. The two northern repeater sites, located approximately one mile south southeast of the Waucoba Mine, are in nonwilderness areas immediately adjacent to Saline Valley Road. The Galena Ridge repeater site is in Death Valley National Park, surrounded by the Nelson Range Wilderness but sited on nonwilderness lands in the cherry-stemmed road area.

2.3.1 Operational Alternatives Initially Considered but Eliminated

A number of operational alternatives, other than providing radar in the Saline Valley area, were evaluated for the proposed project. One alternative was to revise DOD operational procedures to change the Saline Valley flight area from "shared use" to "exclusive use," where one aircraft mission (with supporting aircraft) is permitted to operate at a time, instead of the existing shared-use environment that allows multiple aircraft to operate simultaneously. A second alternative initially considered would have required that the control agency segregate flights by time and altitude, a procedure used before radar was available across the country. Implementation of either of these alternatives would severely reduce the number of civilian and DOD missions within the Saline Valley airspace. It would further restrict both military research and development, and readiness training operations in the R-2508 Complex. In addition, other entities that manage land under the airspace have a requirement for unrestricted access to carry out their responsibilities for surveillance, rescue, and fire suppression operations. Such access would be limited under these alternatives.

Other alternatives, such as the use of tactical military systems, unmanned air vehicles designed for aircraft command and control, or high frequency airborne radar, were considered and dismissed. An FAA-certified Air Traffic Control (ATC) beacon radar was selected because it meets all International Civil Aviation Organization (ICAO) and FAA standards (FAA Order 1010.51A and ICAO Annex 10) for ATC services. Also, alternatives such as using military continuous airborne radar surveillance (AWACS) would not be feasible since these aircraft would not be available to meet the time requirements of the project and could not be FAA-certified. The use of aircraft global position system (GPS) oriented satellite systems was not pursued because the FAA has not implemented the ground-based components of a GPS-based Air Traffic Control System. As of this writing, aircraft are not required to have the airborne portion of the system installed.

An alternative that was initially considered involved the use of a mobile radar beacon system to avoid the need for the installation of the more permanent structures anticipated under the proposed action. However, since continuous radar coverage over the Saline Valley is required during daylight hours throughout the year, a mobile radar installation would become, in effect, a permanent installation. The major components required for a permanent facility are also needed for a mobile unit. To meet FAA certification standards, the antenna tower and structure must be rigid, ruling out a portable tactical beacon radar antenna. There is also the concern that from a long-term maintenance standpoint, the limited space available in a mobile beacon radar system would not be acceptable to FAA. The installation of a mobile unit to support a specific mission was determined to not be feasible because of the remoteness of the Saline Valley area and the attendant travel distance, time required for installation, and high probability of induced failures caused by transport over unimproved routes.

Adding beacon radar in the Saline Valley is the least intrusive alternative that would provide the required levels of flight safety without impacting the capability of DOD and civilian organizations to operate in the R-2508 Complex. Furthermore, the ability to conduct timely search and rescue operations is influenced by the availability of radar data that provides precise aircraft positions. In 1999, a Marine Corps jet aircraft crashed in the Saline Valley area. Because of the lack of radar data, the search area initially included most of the Saline Valley, resulting in time delays to locate the downed airman. With radar coverage, the search could have been pinpointed to a football-field-sized area, expediting aircrew member rescue. Safety is the number one priority in the R-2508 Complex, and the installation of a beacon radar system would greatly increase aircraft rescue and recovery operations in the Saline Valley area.

2.3.2 Higher Elevation Alternatives Initially Considered but Eliminated

R-2508 Complex engineers investigated seven sites, located in the mountains along the western and southern rims of the Saline Valley, as potential sites for the proposed beacon radar facility. The preliminary evaluation included a computerized analysis of potential radar coverage associated with the seven site alternatives, followed by onsite visits. All seven sites were eliminated from further consideration based on site visits and more detailed study because they had limited radar coverage.

Of the seven sites, a site near Galena Peak had the best radar coverage. However, computer modeling for this site indicated as little as 50% coverage over the Saline Valley floor. The estimated percentage reduction in coverage is based on software models and is considered optimistic compared to expected results. This limited radar coverage

is primarily due to shadowing from intermediate ridges that block radar signals from the western portion of the Saline Valley. The site near Galena Peak does not provide low-level radar coverage over the gap that separates the Panamint and Saline Valleys because of high terrain to the south and southeast.

2.3.3 Saline Valley Floor Alternative Beacon Radar Sites Initially Considered but Eliminated

To identify the most suitable locations for the proposed beacon radar facility within the Saline Valley floor, the entire Saline Valley was mapped using Geographic Information System (GIS) techniques. The Inyo Mountains to the west, the Saline Range to the north, the Last Chance Range to the east, and the Panamint Valley to the south generally bound the survey area. A variety of environmental variables, or attributes, were analyzed. These attributes were considered and may limit the feasibility of locating the beacon radar facility within a particular site.

This site suitability analysis considered the following attributes:

- *Floodplains and Wetlands*—These areas corresponded to those locations within and around the Salt Lake. The Salt Lake itself is a semipermanent body of water identified as a development constraint. In addition, those areas around the Salt Lake that may be subject to periodic inundation and flooding were noted. There are no jurisdictional wetlands. None of the sites are located in a floodplain (Appendix A).
- *Intermittent Streams/Hydrology*—The Saline Valley serves as a drainage basin for the surrounding Nelson Range, Inyo Mountains, Saline Range, and the Last Chance Range. Numerous intermittent streams and channels were identified as development constraints because of their potential for flooding. All of the candidate beacon radar and repeater sites are located outside of the existing intermittent streams delineated by the United States Geological Survey (AFFTC/EM 2002a).
- *Other Hydrologic Features*—The springs and wells found within the Saline Valley were also identified as part of the land use suitability analysis. While these features may not necessarily represent a constraint to site development, they are important considerations because of their potential sensitivity (in regard to cultural resources, wildlife, and aesthetics). The beacon radar Alternatives A, D, and E are located near springs or wells.
- *Vegetation Areas*—The Saline Valley floor itself largely consists of a large playa and areas with extensive alluvial scatter associated with the erosion of the surrounding mountains. The dominant vegetation community within the Saline Valley is creosote bush scrub. However, there are concentrations of vegetation, including hydrophytic plant species in areas located in the vicinity of the Salt Lake.
- *Physiographic Constraints*—The Saline Valley is typical of the Basin and Range Physiographic Province. This consists of Horst and Graben features reflecting seismic faulting with uplifts and depressions. The variables considered in the land use suitability analysis included topography, faults, bajadas, alluvial fans, and dune features.
- *Cultural/Man-Made Features*—Man-made features were considered, such as the Salt Lake Tramway, other cultural resources, and a number of mines located on the west-facing slope of the Nelson Range, and the east-facing slope of the Inyo Mountains. Portions of the larger planning area were considered for inclusion into the Timbisha Shoshone Homeland, and efforts were made to avoid those locales that are being considered for inclusion into the Homeland. One of the preliminary sites was eliminated on this basis. Finally, the unimproved routes located in the Saline Valley that would facilitate site access were also identified.
- *Recreation Resources* – This attribute considers the type of recreation use compatible with NPS and BLM guidelines for the proposed project area.
- *Visual Resources*—This attribute considers a site's visibility to the public from the Saline Valley Road.
- *Radar Coverage*—This attribute considers a site's ability to meet the requisite ATC and mission control criteria for radar coverage within the Saline Valley area.
- *Solar*—This attribute considers a site's exposure to the sun throughout the year. This is an important factor when considering the facility's use of solar energy as the primary power source for the facility.
- *Construction/Access*—This attribute considers site accessibility with two- or four-wheel drive vehicles, specifically for long-term maintenance activities.

This site suitability analysis considered a total of 22 sites concentrated within nine areas. These concentrations were referred to as Clusters A through I. Each cluster held one to five sites. Four key attributes were considered in the suitability analysis of the 22 sites: radar coverage, visibility from Saline Valley Road, solar exposure characteristics, and construction/access. The four key attributes are summarized in Table 2-1.

Five candidate beacon radar sites were selected for more detailed evaluation. These correspond to the five "action" alternatives analyzed in this EA. These are listed as Grey Eagle Mine Alternative; Keyes Canyon Alternative, McElvoy Canyon Alternative; Keyes Canyon North Alternative, and Central Saline Alternative.

2.4 Overview of Beacon Radar Facility Alternatives

This section describes project alternatives pursuant to NEPA requirements. Five sites emerged as the best candidates for the proposed beacon radar facility. The five beacon radar sites and three microwave repeater locations ultimately selected for consideration are the focus of this EA. Each beacon radar alternative would require the installation of one repeater. Photo simulations of a beacon radar facility or microwave repeater at the proposed sites are presented in Figures 2-4, 2-6, 2-8, 2-10, 2-12, 2-14, and 2-16. Figure 2-18 is a photograph of a mock-up temporarily constructed on the Galena Ridge site.

All of the alternative beacon radar sites under BLM management are subject to the *California Desert Conservation Area (CDCA) Management Plan*. This Plan provides for the classification of lands based on the sensitivity of resources and kinds of uses. Each classification describes a different type or level of use that is permitted. This proposed action will occur in an area designated as Class "L" (Limited Use) under the CDCA Plan. A Class "L" designation in the CDCA Plan mandates that the land affected by the proposed action be managed in a way to protect "sensitive, natural, scenic, ecological, and cultural resource values." The management of these lands is to provide for low-intensity, carefully controlled multiple use of the resources, while ensuring that sensitive values are not significantly diminished.

Several of the proposed sites are located near or immediately adjacent to wilderness areas established by the California Desert Protection Act established by Congress in July 1994. According to this act, viewshed is not a strong enough issue to place any visual buffer zones around wilderness areas, let alone nonwilderness NPS areas. The following is the statement regarding buffer zones around wilderness.

> BUFFER ZONES, Section 105. The Congress does not intend for the designation of wilderness areas in section 102 of this Act to lead to the creation of protective perimeters or buffer zones around any such wilderness area. The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area.

The following list presents the alternatives being considered.

- *Alternative A (Central Saline)*—The beacon radar site is located north of the Salt Lake, 1.3 miles east of Saline Valley Road.
- *Alternative B (McElvoy Canyon)*—The site is located immediately west of Saline Valley Road, on an alluvial fan at the mouth of the McElvoy Canyon.
- *Alternative C (Grey Eagle Mine)*—This site is located west of Saline Valley Road. The existing Grey Eagle Mine is located southwest of the site.
- *Alternative D (Keyes Canyon)*—This site is located west of Saline Valley Road and east of Pat Keyes Canyon, approximately one-quarter mile northeast of Badwater Springs.
- *Alternative E (Keyes Canyon North)*—This site is located west of Saline Valley Road and east of Pat Keyes Canyon, approximately 0.8 mile north of Badwater Springs.
- *Alternative F (No Action Alternative)*—Generally, for construction projects, the environmentally preferred alternative is no action. "This means the alternative that causes the least damage to the biological and physical environment" (NPS Director's Order No. 12, 2001).

Table 2-1. Beacon Radar Site Suitability Matrix					
Cluster/Site	**Radar Coverage**	**Construction/ Access**	**Solar Exposure**	**Visibility from Road**	**Overview of Constraints**
Cluster A – Willow Creek Camp Site Cluster					
Site A-1	Moderate	Moderate	Poor	Poor	Shading of solar panels
Site A-2	Moderate	Moderate	Poor	Poor	Shading of solar panels
Site A-3	Moderate	Good	Moderate	Moderate	Grey Eagle Mine Alternative Radar Coverage – 80%; Solar Loss – 7.84%
Cluster B – Pat Keyes Canyon Cluster					
Site B-1	Moderate	Good	Moderate	Moderate	Keyes Canyon Alternative Radar Coverage – 80%; Solar Loss – 5.45%
Site B-2	Moderate	Moderate	Moderate	Poor	McElvoy Canyon Alternative Radar Coverage – 85%; Solar Loss – 4.95%
Site B-3	Moderate	Moderate	Moderate	Poor	Keyes Canyon North Alternative Radar Coverage – 80%; Solar Loss – 5.08%
Cluster C – Beveridge Canyon Site Cluster					
Site C-1	Good	Moderate	Moderate	Moderate	Limited access
Site C-2	Good	Moderate	Moderate	Moderate	Limited access
Cluster D – Central Saline Valley Cluster					
Site D-1	Good	Poor	Good	Moderate	
Site D-2	Good	Poor	Good	Good	Central Saline Alternative Radar Coverage – 95%; Solar Loss 2.30%
Site D-3	Good	Poor	Good	Moderate	
Cluster E – Salt Lake Cluster					
Site E-1	Good	Moderate	Good	Poor	
Site E-2	Good	Good	Good	Poor	
Site E-3	Good	Moderate	Good	Poor	
Cluster F – Waucoba Wash Site Cluster					
Site F-1	Good	Moderate	Good	Good	
Sites F2 – F4	Good	Poor	Good	Good	Access constraints
Cluster G – Palm Spring Site Cluster					
Site G-1	Moderate	Good	Good	Good	Limited radar coverage
Cluster H – East Saline Valley Road Cluster					
Site H-1	Poor	Poor	Good	Good	Site does not meet ATC radar coverage criteria
Site H-2	Poor	Poor	Good	Good	Site does not meet ATC radar coverage criteria
Cluster I – Lippencott Mine Cluster					
Site I-1	Poor	Poor	Good	Good	Site does not meet ATC radar coverage criteria

Notes: 1. Rankings for **Radar Coverage** include the following: **Good**: >85%, **Moderate**: >75% though <85%, and **Poor**: <75%.

2. Rankings for **Construction/Access** include the following: **Good**: within 1/16 mile of an access road and stable surface (sandy) and subsurface (liquefaction) soil conditions. Low potential for flooding. **Moderate**: 1/16 to 0.5 mile from an access road and stable surface and subsurface soil conditions. Moderate potential for flooding. **Poor**: more than 0.5 mile from an access road and potential for unstable surface and subsurface soil. Highest potential for flooding.
3. Rankings for **Solar Exposure** loss include the following: **Good**: <5%, **Moderate**: >5% though <10%, and **Poor**: >10%.
4. Rankings for **Visibility from Road** include the following: **Good**: the site is generally concealed from the view of the public along the Saline Valley Road; **Moderate**: the site exhibits limited visibility from the Saline Valley Road; and **Poor**: the site is highly visible from the Saline Valley Road.

2.4.1 Alternative A (Central Saline)

This site is located north of the Salt Lake near the center of the Saline Valley. The site is approximately 1.25 miles east of Saline Valley Road, and is south of, and adjacent to, an unimproved dirt route. The Central Saline site is approximately 500 feet south of an artesian well, with associated stands of tamarisk, mesquite, and cottonwood trees. The site is disturbed (fences, roadways, and refuse heaps) and is generally devoid of vegetation. The elevation is 1,118 feet above mean sea level (AMSL) and its geographic coordinates are latitude 36° 44.508' N, longitude 117° 49.392' W. The site offers the most potential for solar exposure. This site is located in a nonwilderness area within the boundaries of the Death Valley National Park. A wilderness and concealment area is located immediately north of the site, though it is separated from the site by a fence. No activities related to the project would extend or encroach into this wilderness area. The site location is presented in Figure 2-3. A photo simulation of a beacon radar facility is presented in Figure 2-4.

2.4.2 Alternative B (McElvoy Canyon)

This site is located at the base of an alluvial fan situated along the east-facing slope of the Inyo Mountain range, approximately 600 west of Saline Valley Road. An unimproved dirt route would need to be provided to access the Saline Valley Road. Major topographic features in the vicinity include McElvoy Canyon, located approximately 0.5 mile to the west of the site. The elevation is 1,315 feet AMSL, and its geographic coordinates are latitude 36° 46 32.9' N, longitude 117° 53 03.8' W. The site location, in close proximity to the Inyo Mountain Range, would reduce solar exposure times, especially during winter months. This site is located on land under the jurisdiction of the BLM and is on nonwilderness lands. The site location is presented in Figure 2-5. A photo simulation of a beacon radar facility is presented in Figure 2-6.

2.4.3 Alternative C (Grey Eagle Mine)

This site is located at the base of an alluvial fan situated along the east-facing slope of the Inyo Mountain range. The site is approximately 0.4 mile west of Saline Valley Road. Access is possible via an unimproved dirt road located south of, and adjacent to, the site. Major topographic features in the vicinity include Cougar Canyon, approximately 0.8 mile to the north. The site, in close proximity to the Inyo Mountain Range, would also reduce solar exposure times, especially during winter months. The site is relatively undisturbed. Grey Eagle Mine is visible from the site to the southwest. This site is located on land under the jurisdiction of the BLM and is on nonwilderness lands. The elevation is 2,217 feet AMSL, and its geographic coordinates are latitude 36° 49.986' N, longitude 117° 55.368' W. The site location is presented in Figure 2-7. A photo simulation of a beacon radar facility is presented in Figure 2-8.

2.4.4 Alternative D (Keyes Canyon)

This site is located at the base of an alluvial fan situated along the east-facing slope of the Inyo Mountain range. The site is west of Saline Valley Road, though access would be possible via an unimproved dirt route that connects to Saline Valley Road. The site is north of the end of the unimproved route leading to Badwater Springs. Major topographic features in the area include Pat Keyes Canyon and Badwater Springs, both located to the west. The site is approximately 0.7 mile west of the Saline Valley Road. The elevation is 1,541 feet AMSL, and its geographic coordinates are latitude 36°47.424' N, longitude 117° 53.808' W. The location, in close proximity to the Inyo Mountain Range, would reduce solar exposure times, especially during winter months. The site is in a relatively undisturbed area. This site is located on land under the jurisdiction of the BLM in nonwilderness lands. The site location is presented in Figure 2-9. A photo simulation of a beacon radar facility is presented in Figure 2-10.

2.4.5 Alternative E (Keyes Canyon North)

This alternative is similar to Alternative D. It was considered because of improved solar exposure over Alternative D, and a better line-of-sight to one of the microwave repeater locations. Site elevation is 1,605 feet AMSL, and its geographic coordinates are latitude 36°48 03.5' N, longitude 117° 53 30' W. Location is approximately one mile north of Badwater Springs, 750 feet west of the Saline Valley Road. No access route exists for this site. This site is located on land under the jurisdiction of the BLM in nonwilderness lands. The site location is presented in Figure 2-11. A photo simulation of a beacon radar facility is presented in Figure 2-12.

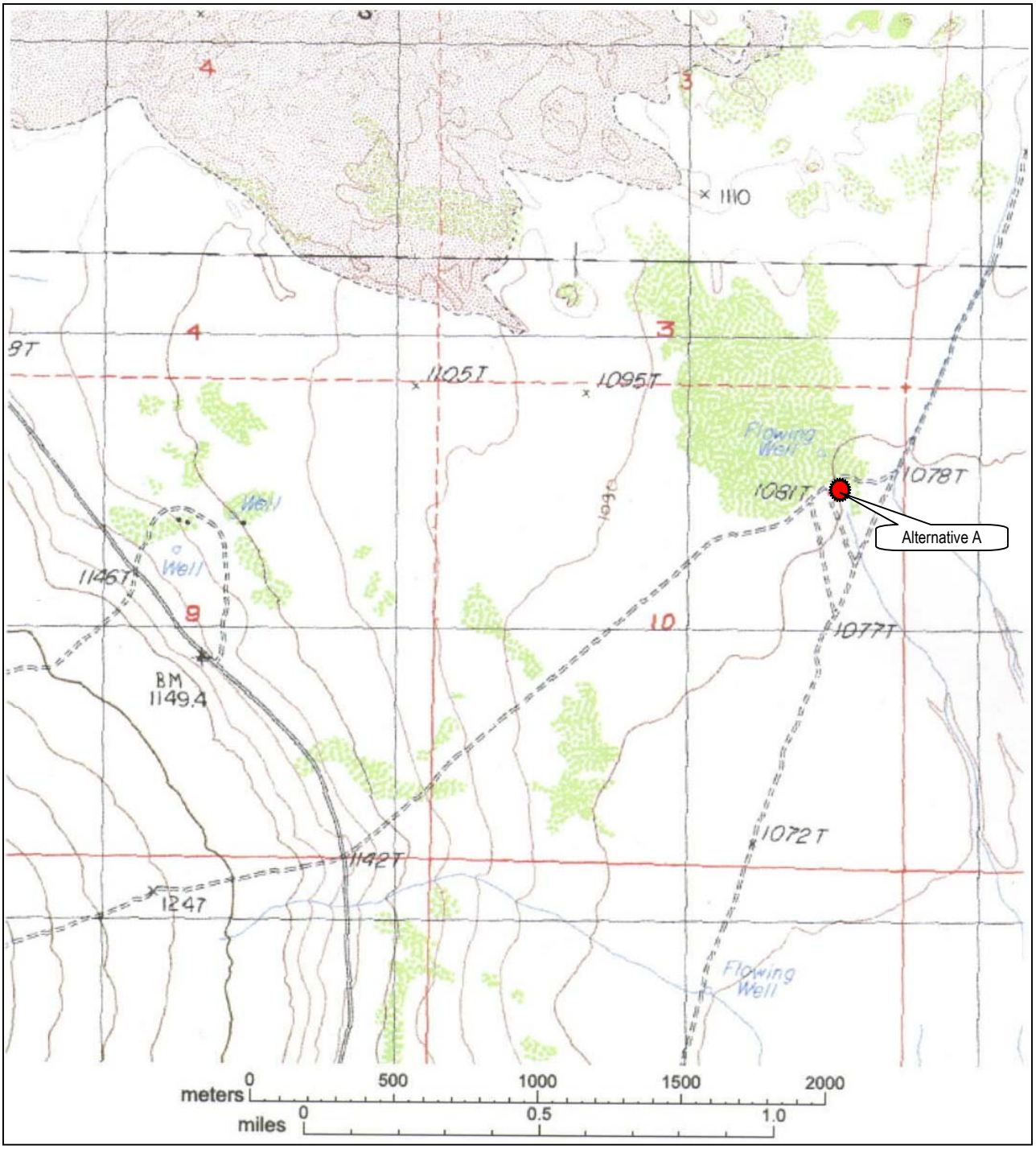
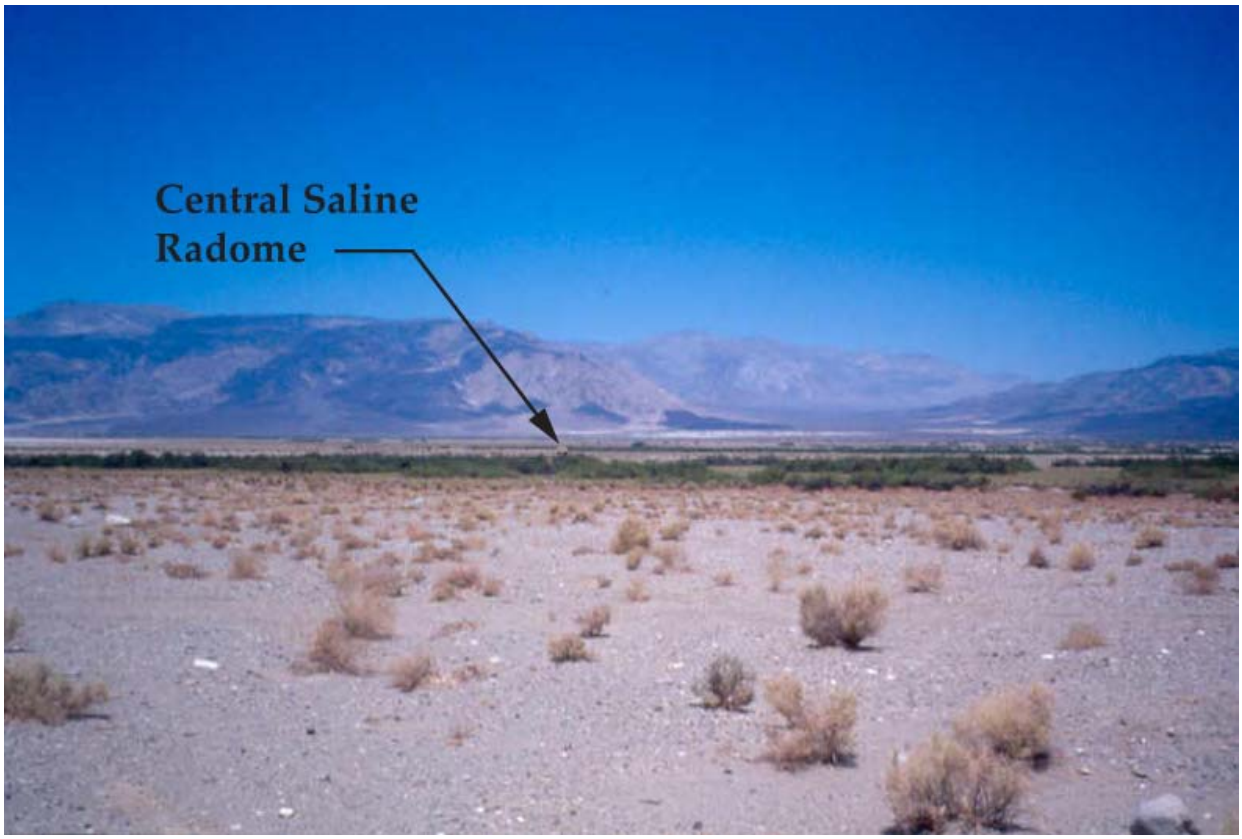


Figure 2-3
Alternative A (Central Saline) Beacon Radar Site Location Map



View of Alternative A, Central Saline, looking east from Saline Valley Road.

Figure 2-4
Photo Simulation of a Beacon Radar Facility at Alternative A (Central Saline)

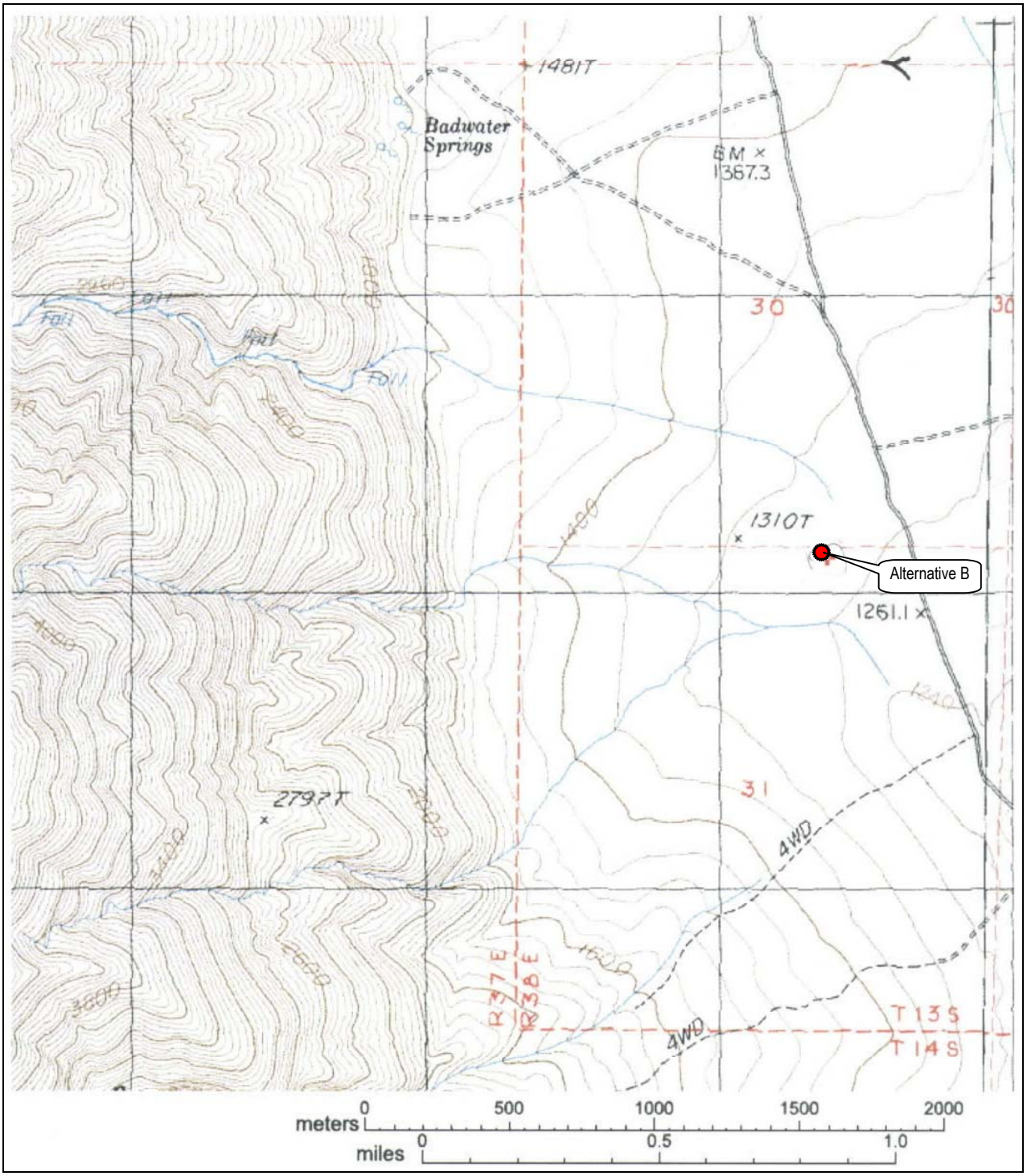


Figure 2-5
Alternative B (McElvoy Canyon) Beacon Radar Site Location Map

View of Alternative B, McElvoy Canyon, looking west from Saline Valley Road.

Figure 2-6
Photo Simulation of a Beacon Radar Facility at Alternative B (McElvoy Canyon)

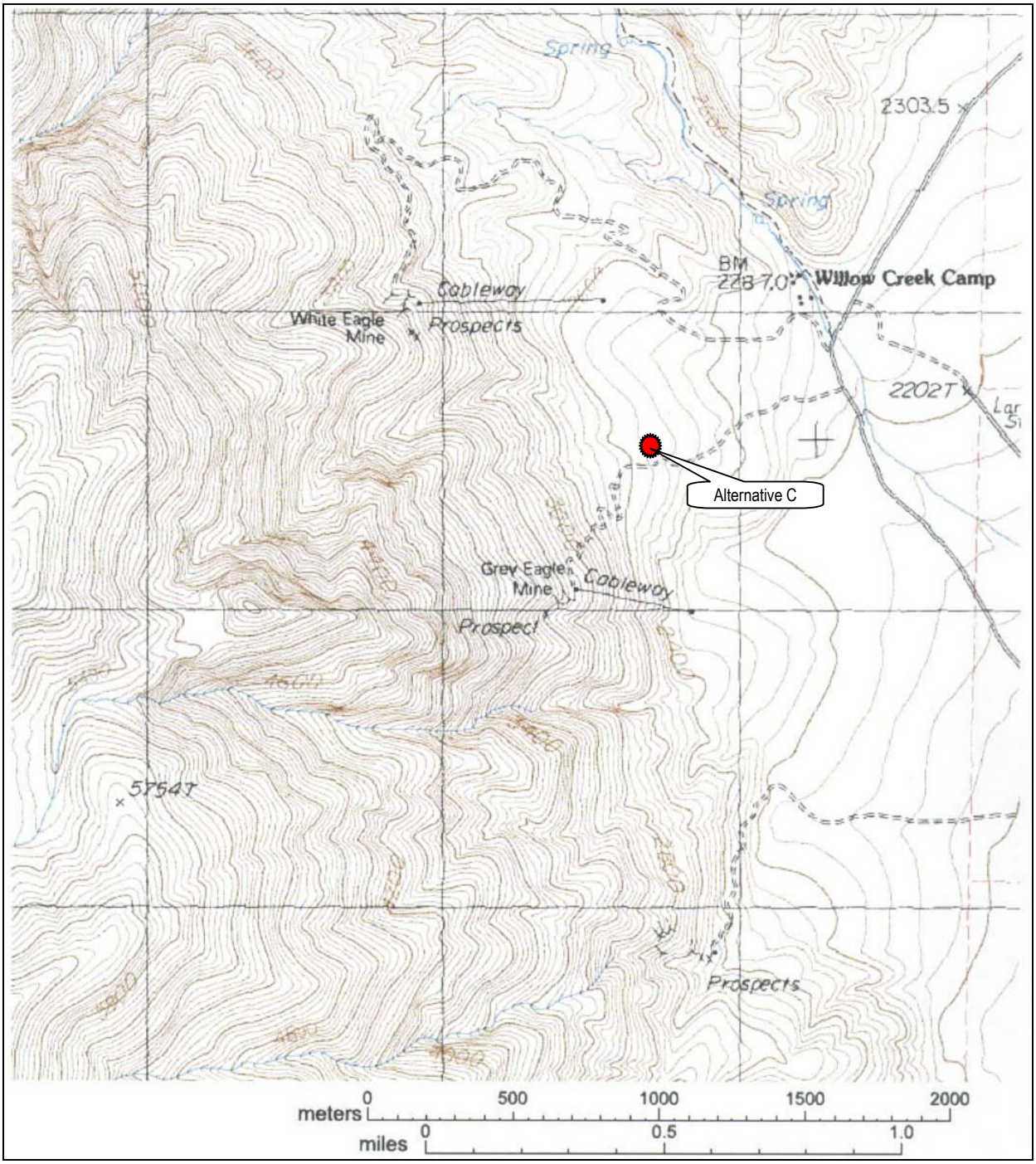


Figure 2-7
Alternative C (Grey Eagle Mine) Beacon Radar Site Location Map

View of Alternative C, Grey Eagle Mine, looking west from Saline Valley Road.

Figure 2-8
Photo Simulation of a Beacon Radar Facility at Alternative C (Grey Eagle Mine)

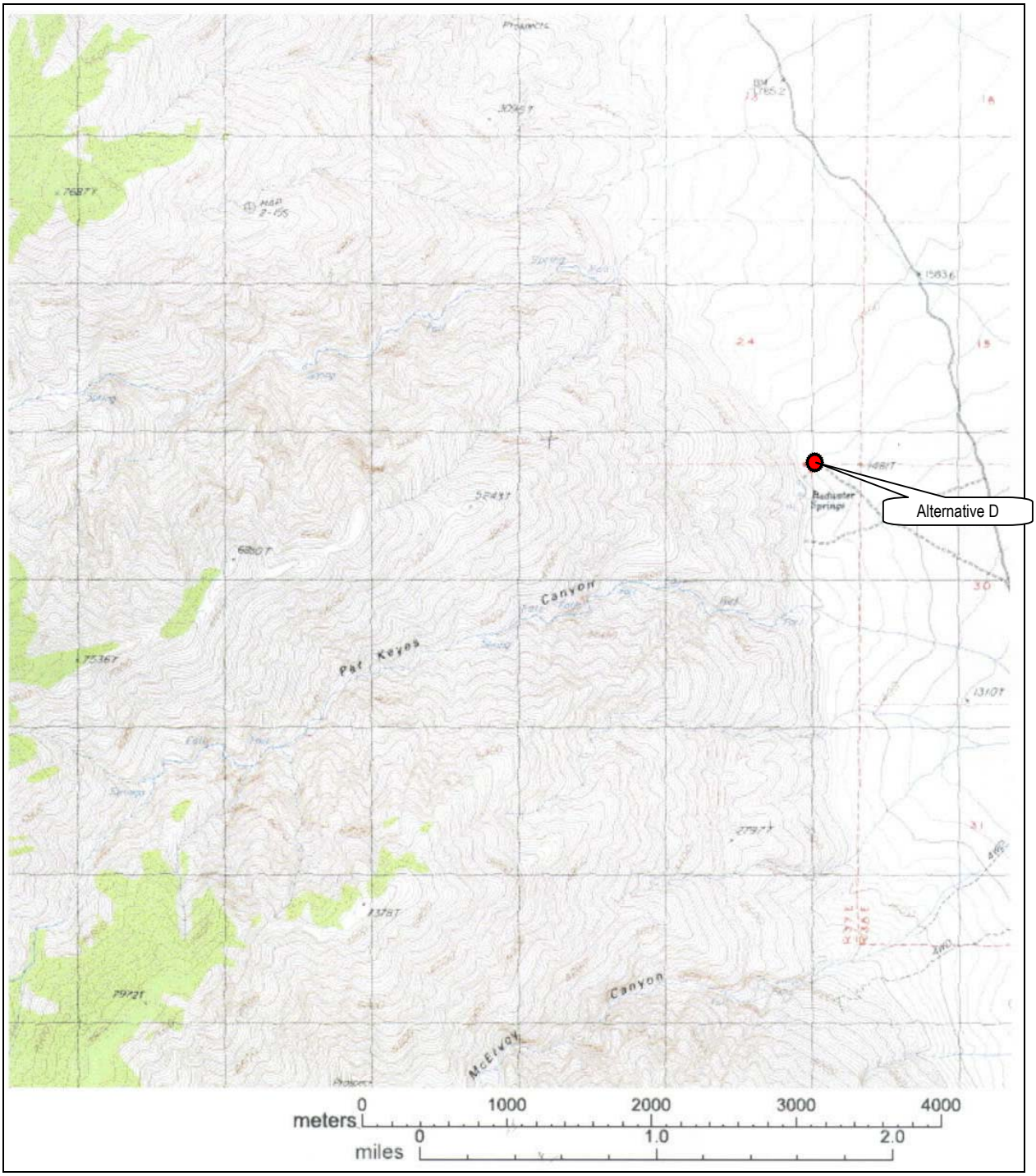


Figure 2-9
Alternative D (Keyes Canyon) Beacon Radar Site Location Map

View of Alternative D, Keyes Canyon, looking west from Saline Valley Road.

Figure 2-10
Photo Simulation of a Beacon Radar Facility at Alternative D (Keyes Canyon)

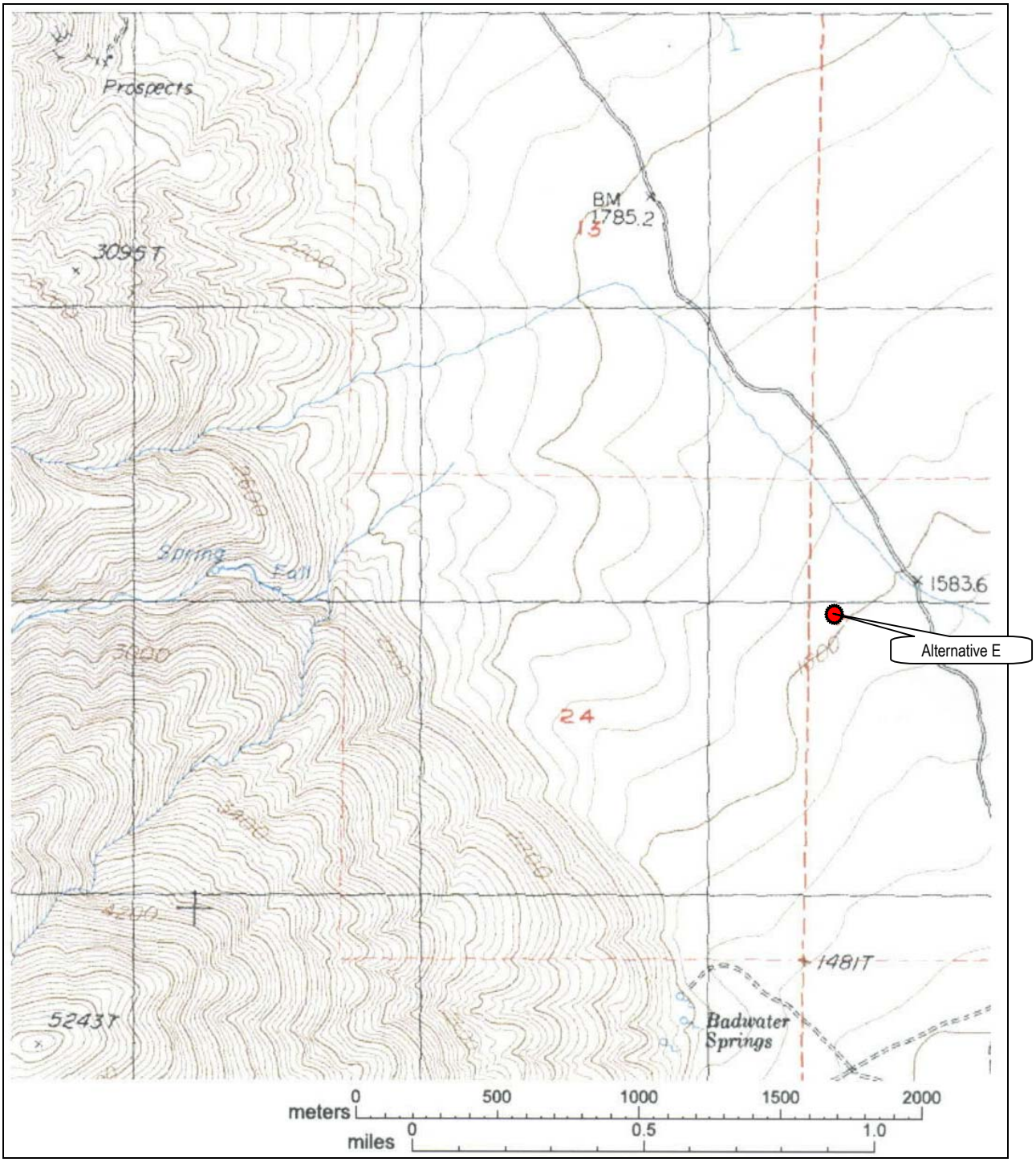


Figure 2-11
Alternative E (Keyes Canyon North) Beacon Radar Site Location Map

View of Alternative E, Keyes Canyon North, looking west from Saline Valley Road.

Figure 2-12
Photo Simulation of a Beacon Radar Facility at Alternative E (Keyes Canyon North)

2.4.6 Alternative F (No Action Alternative)

This alternative assumes that the proposed project would not be implemented and, as a result, no radar coverage in the Saline Valley portion of the R-2508 Complex would be provided. No beacon radar facility and microwave repeater would be installed, and flight operations would continue as is. Existing ATC operations would continue in their current state and the status quo would be maintained.

2.4.7 Overview of Microwave Repeater

2.4.7.1 Site Selection Process

The following criteria were used in the site selection process for three microwave repeater alternatives.

- The site must have a clear line-of-transmission to two or more of the proposed beacon radar sites and the FAA communications complex on Keeler Peak in the Inyo Range;
- The site must have an established access route that avoids designated wilderness areas to eliminate potential impacts on sensitive and protected areas;
- The site must have a suitable site area to develop with minimal grading and site preparation required; and
- The site's elevation must be sufficient to allow for the elimination of air conditioning to cool equipment.

Several other repeater sites that were initially suitable from a line-of-sight screening standpoint were ultimately rejected because they failed to meet all of the criteria. Avoiding the use of air conditioning for equipment and battery cooling significantly reduces the facility size and complexity. An air-conditioned facility would require a much larger footprint (for the standby power plant propane generator), a much larger solar-panel array, and a modular building to house the electronics equipment, generator, and batteries. All of the equipment needed to support a non-air-conditioned microwave repeater, including a single small solar panel, could be tower- or structure-mounted, reducing the environmental impact. The three sites that met most of the criteria were selected for further computerized screening analysis. These included:

- Two sites, less than one-half mile apart, along the northern portion of the Saline Valley Road, north of Lead Canyon; and
- One site on a mining, cherry-stemmed road in the Nelson Range, located approximately 1.5 miles northwest of Galena Ridge, identified as the Galena Ridge Site.

The major advantage of these sites is the relatively cooler temperatures associated with the higher elevation that permits the electronics and electrical equipment to be operated without supplemental cooling. This significantly reduces the size and complexity of the development site, overall equipment and installation cost, and maintenance visits. The environmental settings of the Galena Ridge and Lead Canyon repeater sites are presented in Figure 1-3. The site locations and photo simulations of the repeaters are presented in Figures 2-13 through 2-17. Figure 2-18 is a photograph of a mock-up repeater temporarily constructed on the Galena Ridge site.

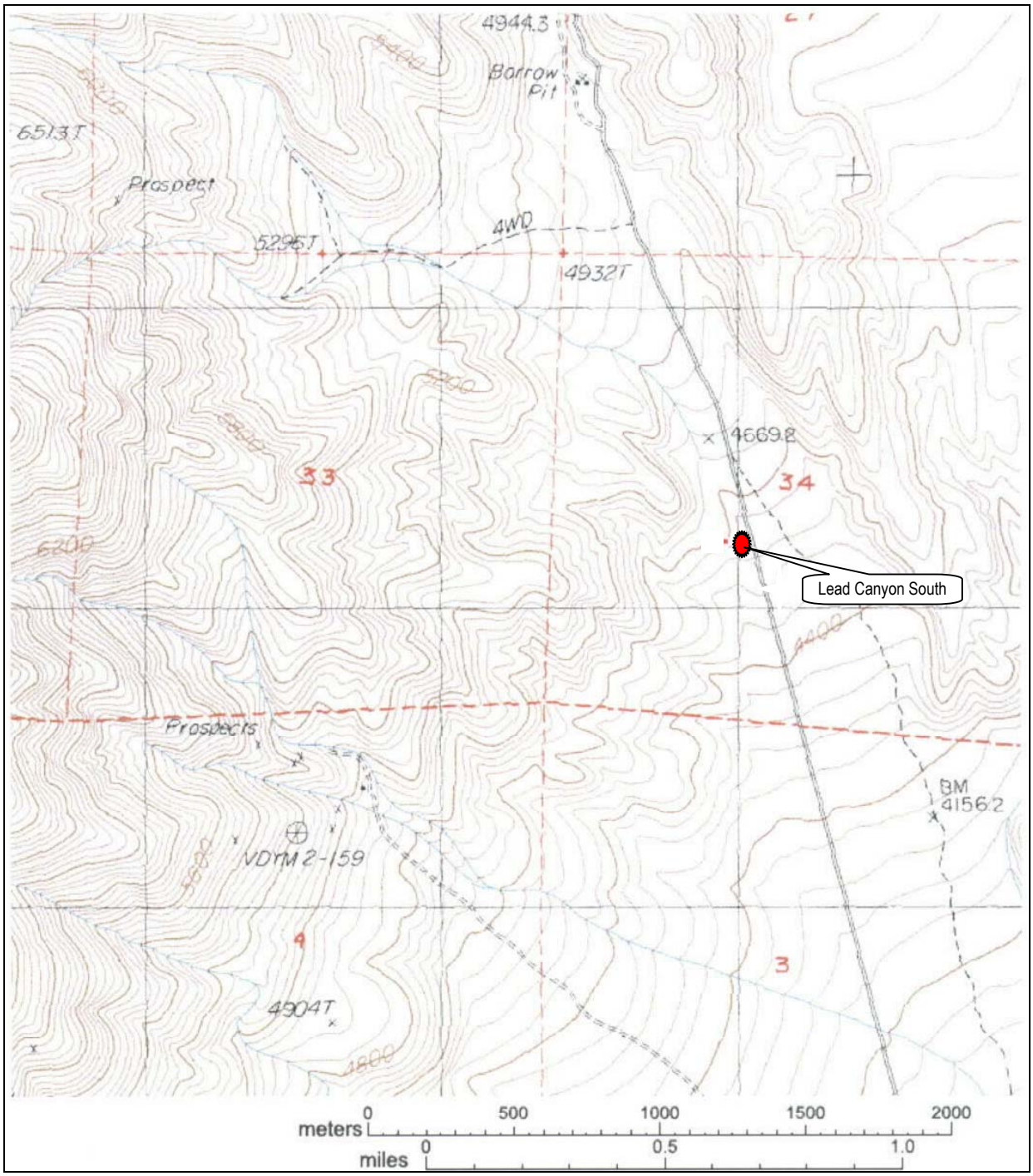
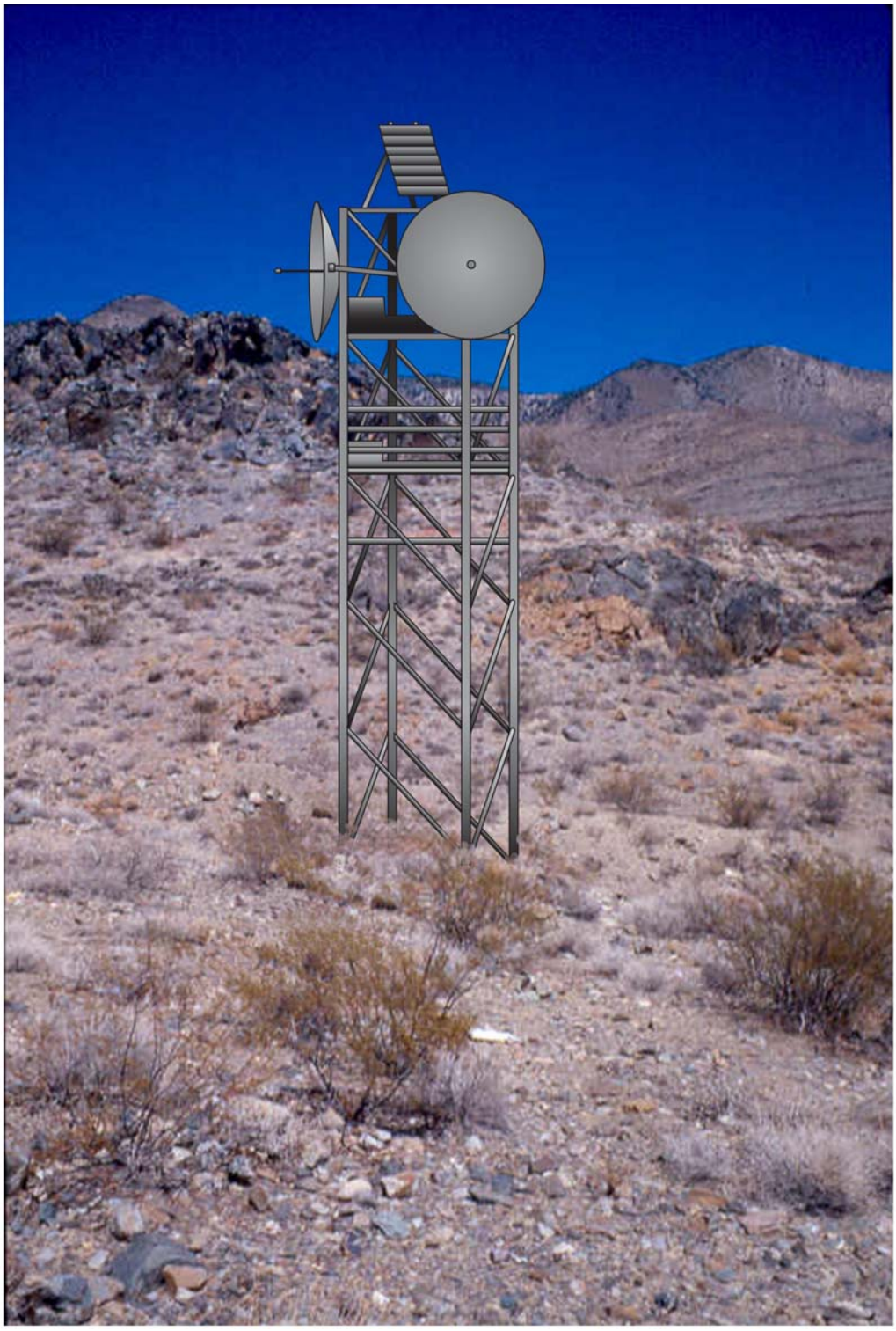


Figure 2-13
Lead Canyon South Beacon Radar Site Location Map



View of Lead Canyon South Repeater Site looking west from Saline Valley Road.

Figure 2-14
Photo Simulation of a Microwave Repeater at Lead Canyon South Site

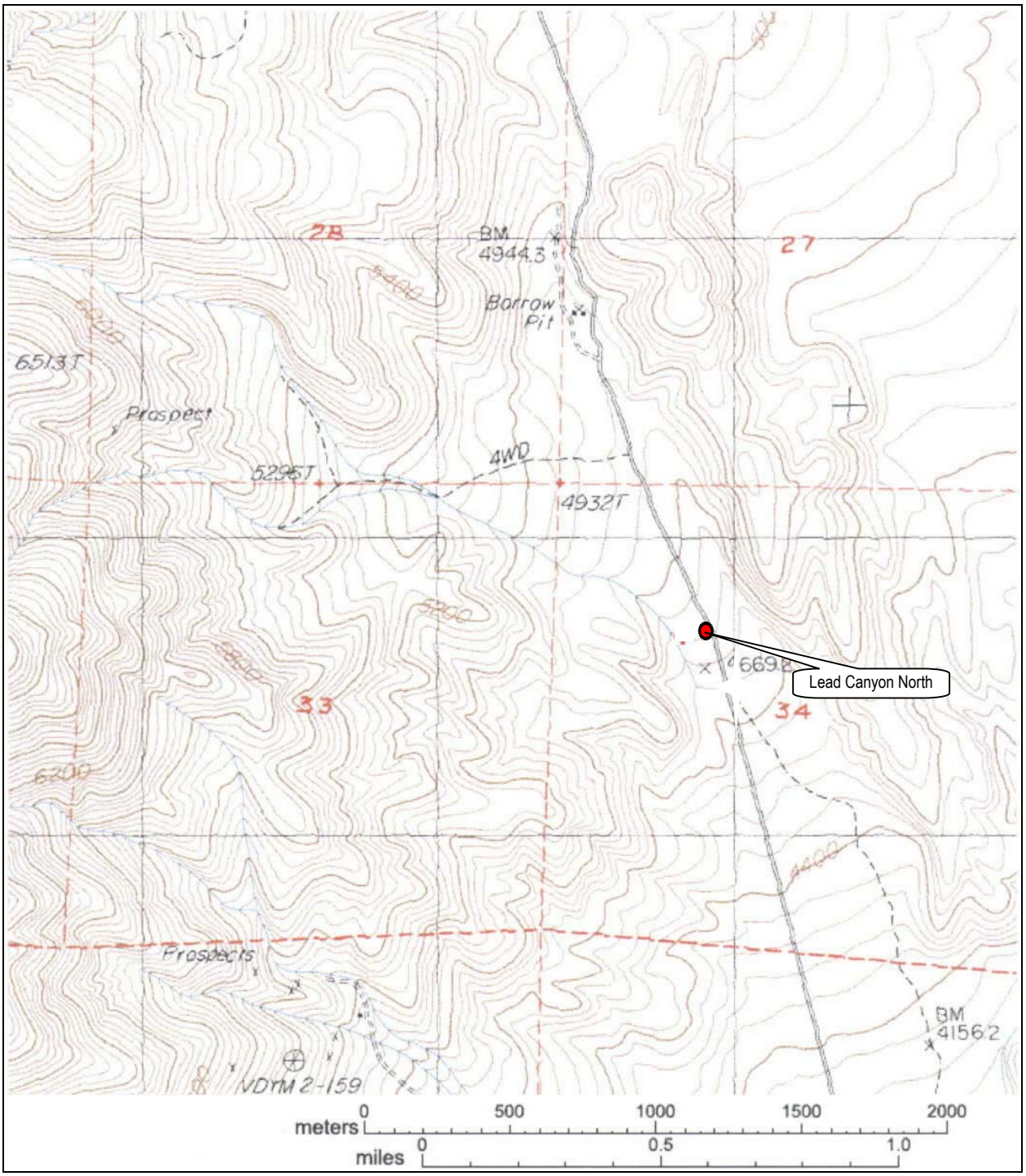


Figure 2-15
Lead Canyon North Microwave Repeater Site Location Map

View of Lead Canyon North Repeater Site looking west from Saline Valley Road.

Figure 2-16
Photo Simulation of a Microwave Repeater at Lead Canyon North Site

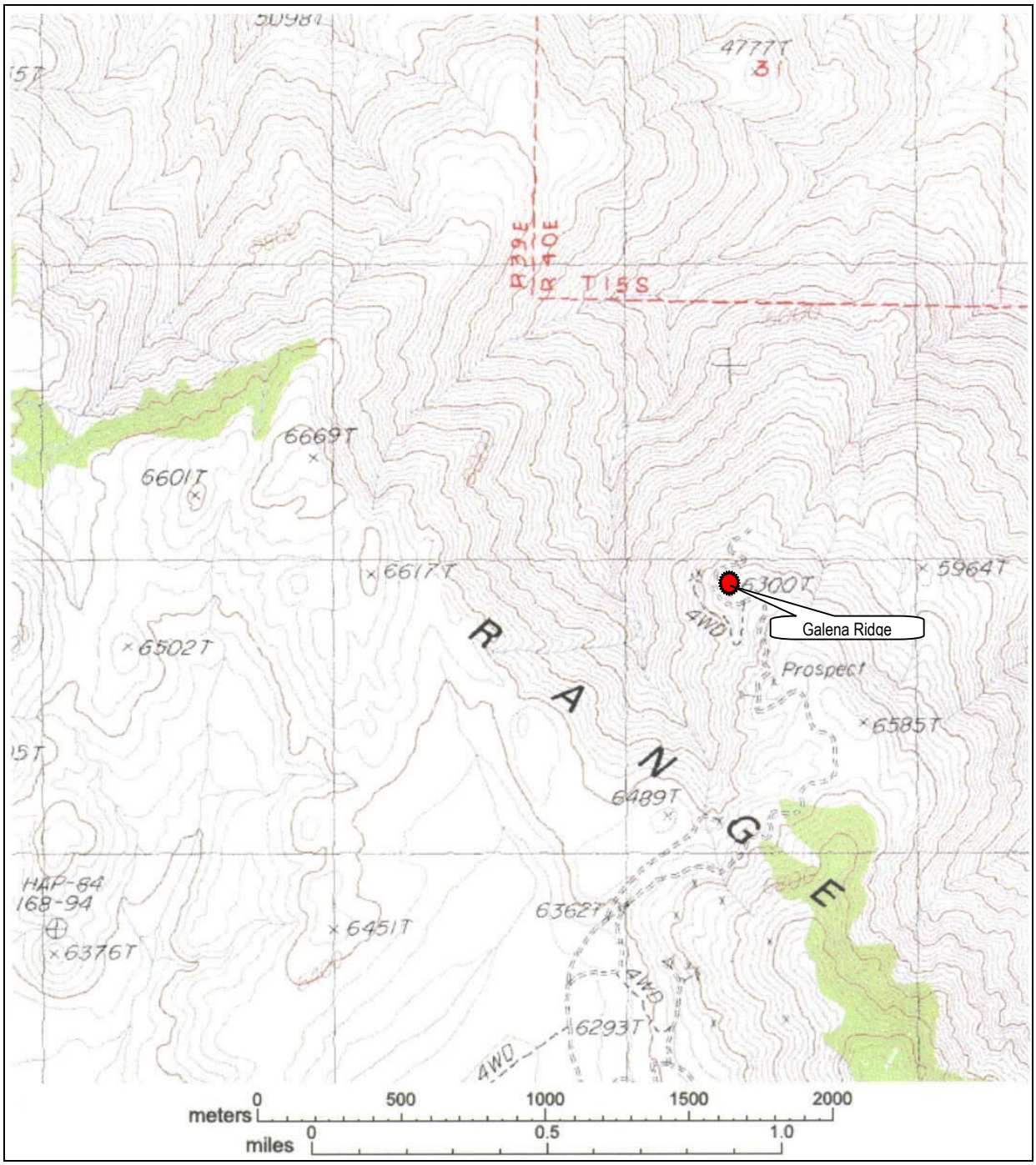


Figure 2-17
Galena Ridge Microwave Repeater Site Location Map

View of the repeater mock-up from a point on the Galena Peak mining road approximately 525 feet from the site.

Figure 2-18
Photograph of a Mock-Up Microwave Repeater Located on Galena Ridge

3.0 AFFECTED ENVIRONMENT

3.1 Affected Environment

This section of the EA establishes the baseline for the decision-maker and the public to compare the effects of the action alternatives for the proposed beacon radar facility and the microwave repeater. The following environmental attributes comprise the existing environment analyzed in this EA: land use and visual and recreational resources, geology and soils, water and hydrology, air quality, biological resources, noise, cultural resources, and traffic and infrastructure. The environmental setting relative to these issues is described in Sections 3.2 through 3.9.

The Saline Valley is situated in the west-central portion of Inyo County, California, east of the Owens Valley and west of Death Valley. Major topographic features found within the vicinity of the Saline Valley include the Inyo Mountain range to the west, the Nelson Range to the south, the Last Chance Range to the east, and the Saline Range to the north. The Inyo Mountains separate the Saline Valley from the Owens Valley. The Sierra Nevada Mountains are located further west, and to the west of the Owens Valley (AFFTC 2002a).

3.1.1 Access to Saline Valley

Regional access to the Saline Valley is provided by Big Pine Road (State Route 168) to the north and the Darwin-Olancha Road (State Route 190) to the south. Both of these paved roadways connect with U. S. Highway 395 and serve as the primary means of access to Death Valley National Park from the west. Saline Valley Road, a gravel roadway maintained by Inyo County, serves as the primary means of access into and out of the Saline Valley. This roadway traverses the Saline Valley in a north-south orientation, connecting with the paved highways to the north and south. Numerous smaller unimproved routes, in varying condition, traverse the Saline Valley, though all of these roadways ultimately connect with Saline Valley Road. Traffic volumes along this road are relatively low. During weekday visits to the Saline Valley by the project team involved in the preparation of this EA, the number of other vehicles observed on the road ranged from one to three over the entire 8-hour duration of each site visit.

3.1.2 Regional Setting

Inyo County, California, which includes the Saline Valley, is sparsely settled, with the majority of the county's population residing in communities located within the Owens Valley. The major population centers include the communities of Lone Pine, Bishop, and Independence. These communities are located more than 15 miles to the west of Saline Valley, within the Owens Valley. The current population of Inyo County is estimated by the State of California Department of Finance to be 18,240 (AFFTC 2002a).

There are few permanent residents within the Saline Valley, though there are seasonal increases in the number of temporary residents. Settlements within the Saline Valley are limited to mining camps (generally located along the east-facing slope of the Inyo Mountains and west-facing slope of the Last Chance Range), campgrounds at Palm Spring and Lower Warm Spring (located in the northeast corner of the Saline Valley), and scattered individual dwellings located in the vicinity of the Salt Lake. No structures are located within approximately one-half mile of the proposed sites. Improvements in the general area are limited to Willow Creek Camp and Grey Eagle Mine and the vicinity of the Salt Lake.

The majority of recreational use is in the Palm Spring/Warm Spring area. This area includes two unimproved airstrips, unimproved campsites, restroom facilities, and outdoor semi-enclosed spa areas. The visitor population at the Palm Spring/Warm Spring varies considerably, depending on the time of the year.

The majority of the Saline Valley was incorporated into Death Valley National Park in 1994 (the Park's western boundaries generally correspond to Saline Valley Road, with the Park area located east of the road). The expansion of the Park was a direct outgrowth of the Desert Protection Act, which elevated the status of Death Valley "National Monument" to "National Park" and significantly expanded the boundaries of the Park. The Act, which expanded the Park boundaries, also protected the airspace designation and DOD airspace use (16 USC 410aaa-82). The majority of the land located to the west of Saline Valley Road remains under the jurisdiction of the BLM Field Office, Ridgecrest, California. Scattered parcels located in the vicinity of the Salt Lake are under private ownership, Indian-owned lands, or State-controlled land (AFFTC 2002a). Wilderness areas include NPS wilderness land within the

boundaries of Death Valley National Park and wilderness areas under BLM jurisdiction within the Inyo Mountains Wilderness Area.

3.2 Land Use/Socioeconomic Setting

Land uses within the Saline Valley include activities associated with mining, recreation, and minimal residential use. A number of entities govern land use within the Saline Valley, including BLM lands, National Park lands, State lands, Indian lands, and privately owned lands. Saline Valley land use is largely under the jurisdiction of the NPS. However, BLM-administered public lands are also present. Four of the five alternative radar sites (Alternatives B, C, D, and E) are located within lands administered by the BLM. Radar Alternative A, the Galena Ridge and the two Lead Canyon microwave repeater sites, are located on lands administered by the NPS. Privately owned lands are under the jurisdiction of Inyo County.

3.2.1 Regulatory Requirements/Guidance

3.2.1.1 National Park Service Lands

Death Valley National Park was established to protect natural and cultural resources in the Mojave and Great Basin deserts of California and Nevada and to provide opportunities for public recreation within selected areas. Recreation activities within the park include camping, picnicking, hiking, and sightseeing. The majority of the park visitor activities are concentrated in areas located outside of the Saline Valley, near Furnace Creek and Stovepipe Wells. The majority of visitor use in the Saline Valley is concentrated in the Palm Spring area and in the trails located along the east-facing slopes of the Inyo Mountains.

Beacon radar alternative site, Alternative A, and all the repeater sites are located within nonwilderness areas under the jurisdiction of the NPS. Alternative A is located immediately south of a designated wilderness area. An existing fence separates Alternative A from wilderness lands located to the north. The unimproved access routes that connect Alternative A with Saline Valley Road are located outside designated wilderness areas.

The *Wilderness Act* (16 USC 1131 et seq.), enacted in 1964, established a *National Wilderness Preservation System* composed of Federally owned wilderness areas to be administered for the public's use and enjoyment. According to the *Wilderness Act*, wilderness lands are to remain in their natural condition.

The *California Desert Protection Act of 1994a* (U.S. Senate Bill [SB] 21) significantly altered the status of more than 7 million acres of desert lands within the Mojave Desert region of southern California. The *Desert Protection Act* changed the status of Death Valley National Monument to National Park. The *Desert Protection Act* enlarged the land area of Death Valley National Park so that the Park now includes approximately the eastern two-thirds of the Saline Valley. The Park's westerly boundary now generally corresponds to Saline Valley Road. Death Valley National Park now encompasses 5,000 square miles, of which approximately 4,600 square miles underlay the R-2508 Complex. The California Desert Protection Act of 1994 added 1.3 million acres to the Park, and designated 94% of the Park as wilderness. The General Management Plan for Death Valley National Park has been finalized.

Land uses within Death Valley National Park have generally been placed into one of four categories, based on existing uses and management characteristics:

- The *Natural Category*—More than 90% of the park is included in the natural category, which encompasses lands managed to protect wilderness values.
- The *Historic Category*—The historic category encompasses those lands containing resources listed on, or eligible for, the National Register of Historic Places.
- *Park Development Category*—The park development category encompasses those lands where nonhistoric park development and intensive use has substantially altered the natural environment. The Central Saline beacon radar alternative site and microwave repeater sites fall into this category.
- The *Park Management Category*—This category provides and maintains development that serves the needs of NPS management and large numbers of visitors.

The NPS has proposed guidelines for the developed portions of the Park to establish visual consistency and themes. The primary objective the NPS seeks to accomplish through the development and subsequent implementation of these guidelines is to create visual harmony between the built environment and the natural environment. For example, because of the increasing use of cellular communication equipment, more antennas and relay equipment are being installed throughout the area, and there is pressure to install such equipment in the more remote portions of the Saline Valley. The overall management goal of each NPS unit would be to protect and maintain the visual quality of the landscape and the built environment. As a result, the NPS intends to implement the following objectives for communications equipment proposals, which may also be applicable to the proposed beacon radar facility:

- All aboveground communication equipment should not significantly distract from the visual quality of the scenery.
- Each new proposal for radio or cellular antennas or towers must demonstrate that the equipment would provide a critical service for visitors and NPS staff and not be duplicative.
- Installation of new equipment outside the park, on existing communication towers, or at defined sites should be considered before the construction of new sites is considered.
- New locations would be reviewed through the environmental assessment process, which must consider impacts on the visual quality of the scenery.

Portions of the Saline Valley previously located within BLM lands were designated as an *Area of Critical Environmental Concern* (ACEC). The BLM ACEC land use designations identified areas where special management attention is needed to protect important historic, cultural, and scenic values; to protect fish and wildlife resources or other natural systems and processes; or to protect people from natural hazards. The Saline Valley ACEC included an area with dune, mesquite, and marsh habitat located in the vicinity of the Salt Lake. The area also contains both prehistoric and historic cultural resources, including a village site with rock art and a turn-of-the-century borax operation. In 1986, the original boundary of the Saline Valley ACEC was modified to include additional land to the south, including the ruins of the salt tram. The Saline Valley ACEC was discontinued, since these areas are now included within the National Park boundaries, and falls under NPS management guidelines.

3.2.1.2 Bureau of Land Management Resource Areas

None of the four radar site alternatives are located within the designated BLM Inyo Mountains Wilderness Area. The westerly portions of the Saline Valley, generally located west of Saline Valley Road, are within the jurisdictional boundaries of the BLM, Ridgecrest Field Office. Portions of the lands within the planning area subject to BLM jurisdiction are generally located west of Saline Valley Road. Designated BLM wilderness areas are located further west along the toe of the Inyo Mountains. These wilderness areas include Federal lands that have been so designated by Congress as part of the National Wilderness Preservation System. The Inyo Mountain Wilderness has a total land area of approximately 300 square miles, including portions of the Saline Valley (Bureau of Land Management 2001).

The majority of those BLM-managed lands located within the CDCA have been designated as one of four possible land use classifications, referred to as “multiple-use classes.” This classification system recognizes the sensitivity of those resources found within a particular geographic area. Four of the alternative beacon radar sites (Alternatives B, C, D, and E) are subject to the CDCA requirements. These alternative sites are located in areas designated as Class L or limited use. The management of lands included in this classification provides for low-intensity, carefully controlled multiple use of the resources, while ensuring that sensitive values are not significantly diminished. The BLM, Ridgecrest Field Office has determined that this proposal is consistent with the guidelines of the CDCA Plan and in conformance with the existing multiple-use class designation (BLM 2001a).

The proposed action will occur in areas designated as Class L (Limited Used) under the CDCA Plan. A Class L designation in the CDCA Plan mandates that the land affected by the proposed action be managed in a way to protect “sensitive, natural, scenic, ecological, and cultural resource values.” The management of these lands is to provide for “low-intensity, carefully controlled multiple use of the resources, while ensuring that sensitive values are

not significantly diminished." Pre-existing rights to the Grey Eagle Mine pertaining to access will be addressed if the Grey Eagle Site (Alternative C) is selected.

3.2.1.3 Lands Administered By Other Agencies

A number of other agencies have jurisdiction over lands found within the vicinity of the Salt Lake. A substantial amount of land located north and west of the Salt Lake is under private ownership. In addition, public agencies with land holdings in this area include the Bureau of Indian Affairs, the State of California, and lands reserved by the Federal Government for water conservation. One of the routes that provide access to the Alternative A site crosses Indian land holdings. The northern route, which does not cross Indian lands, would be used for access to the Alternative A site.

3.2.2 Existing Land Use

The nature and extent of land uses within and in the immediate vicinity of the five beacon radar alternative sites are described in the following list:

- *Alternative A (Central Saline)*—This site is located adjacent to two unimproved routes and has undergone extensive disturbance. The site is located approximately 1.25 miles east of Saline Valley Road. A fence and cattle guard located north of the site separate the site from a man-made artesian well and mesquite grove. During numerous field visits evidence of both human and feral burro activities was apparent (tracks, rubbish, and scat). The site is separated from the wilderness area by a fence. No residential structures are located within one mile of the site.
- *Alternative B (McElvoy Canyon)*—This site is located on relatively undisturbed and undeveloped land, approximately 600 feet west of the Saline Valley Road. No structures are located within 1 mile of the site.
- *Alternative C (Grey Eagle Mine)*—This site is located on relatively undisturbed and undeveloped land, approximately 0.4 miles west of Saline Valley Road. The site shares an unimproved access route with Grey Eagle Mine, which is located approximately 0.3 mile to the southwest. The access route is located south of and adjacent to the site. The Willow Creek Camp (an active, occupied mining camp) is located approximately 1 mile north of the site.
- *Alternative D (Keyes Canyon)*—This site is located approximately 0.7 mile west of Saline Valley Road. The site is located within a turnaround area east of Badwater Springs. The area around Keyes Canyon exhibited considerable disturbance during field visits, with evidence of transient habitation.
- *Alternative E (Keyes Canyon North)*—This site is located on relatively undisturbed and undeveloped land, approximately 750 feet west of the Saline Valley Road. No structures are located within 1 mile of the site.

Except for Central Saline (Alternative A), the beacon radar facilities are a minimum of 1/8 mile from wilderness boundaries. All of the proposed beacon radar facility alternatives would require the use of a microwave repeater to transmit data between the beacon radar sites and the existing FAA communications facility located on Keeler Peak. The Galena Ridge repeater site is located within a mining road cherry-stemmed area (surrounded by wilderness) approximately 1.5 miles northwest of Galena Ridge. A rough, four-wheel-drive mining road provides access to this site. The site is presently disturbed and is not within a designated NPS wilderness area. The two Lead Canyon sites are located alongside the Saline Valley Road on nonwilderness land, managed by the NPS.

3.2.3 Visual and Recreational Resource Characteristics

For most visitors, views of the Saline Valley are experienced from Saline Valley Road. Views from the road are dominated by views of Saline Valley Basin. Views within the Saline Valley are dominated by expanses of the Saline Valley basin, with the surrounding mountain ranges serving as a visual backdrop. Overall, the Valley has a high intact natural appearance. However, there are localized areas of disturbance related to past and ongoing mining activity. Typically, the sky provides a crystal blue dome overhead. From most vantage points, the dominant man-made features are Saline Valley Road, campsite improvements at Warm Spring, as well as scattered improvements associated with ongoing or past mining activities. Localized sources of night lighting in the Saline Valley are associated with scattered campsites, with the most pronounced source being located in the vicinity of the Warm

Spring and Palm Spring. The limited recreational activities include hiking, camping, sightseeing, motor-vehicle touring, warm springs use, and nature study.

3.3 Geologic Setting

Geologic resources consist of naturally formed minerals, rocks, and unconsolidated sediments. Soil consists of the uppermost layers of surficial geologic deposits, and is developed by the weathering of those deposits. Concerns associated with the geologic setting within the proposed project area, which could either affect, or be affected by, a proposed alternative, include topography, material site use, site disturbance, and seismicity. The Saline Valley's geomorphology generally reflects the Basin-and-Range physiography associated with the region's faults and the mass wasting that has occurred in relatively recent geological times. This section provides an overview of the Saline Valley's geomorphology and seismic characteristics.

3.3.1 Regulatory Requirements/Guidance

The two regulatory requirements potentially applicable to the proposed project include the *Alquist-Priolo Earthquake Fault Zoning Act* and the *Surface Mining and Reclamation Act (SMARA)*. The *Alquist-Priolo Act* (California Public Resources Code, Division 2, Chapter 7.5, Section 2621 et seq.) provides for the adoption and administration of special regulations that would be implemented by local jurisdictions in relation to specific active earthquake faults. This Act provides policies and criteria related to the location of improvements and structures for human occupancy across the trace of active faults. The three beacon radar alternative sites located along the alluvial fan of the east slope of the Inyo Mountains (Alternatives B through D) are situated in relatively close proximity to the Hunter Mountain fault. This fault, however, has not been assigned an Alquist-Priolo Special Studies Zone designation. Since, however, the beacon radar and microwave repeater facilities would be unmanned, it has been determined that this Act would not apply.

The *SMARA* (California Public Resources Code, Division 2, Chapter 9, Section 2710 et seq.) has two main elements. First is the requirement for review and enforcement of mandated reclamation plans for mining and mineral extraction activities. Second, in the process of classification/designation, the State Office of Mines and Geology must conduct an officially sanctioned survey of mineral resources. The results of these surveys form the basis of how these mineral resources would be classified or designated in terms of statewide importance. A Memorandum of Understanding between the State of California, the United States Department of Agriculture (USDA) Forest Service, and the U. S. Department of the Interior BLM regarding *SMARA* is contained in Title 25 Code of Federal Regulations Part 211 (25 CFR 211); 36 CFR 228 et seq.; and 43 CFR 3500, 3600, 3802, and 3809. Since no mining activities are planned for this proposed action, this Act does not apply.

3.3.2 Geomorphology

The Saline Valley is a component of the larger Basin and Range geomorphic province that comprises portions of eastern California, eastern Oregon, and the majority of Nevada. The oldest rocks found in the area were formed approximately 1.8 billion years ago. The weathered sandstone and limestone rocks that comprise the Nelson Range and the Last Chance Range are much younger, approximately 500 million years in age. Approximately 3 million years ago, the various basins and ranges found within the Saline Valley and in adjacent regions began to form. Recent signs of volcanic activity are also evident in an area east of the Saline Valley at the Ubehebe Crater, located north of the Saline Valley (Hunt 1975).

A number of modifications to the landforms in the Saline Valley were made during Holocene (recent geologic) time due to the gradual warming trend. The area's topographic features have also been altered due to the extensive water and wind-borne (aeolian) erosion that has occurred over the past several thousand years. The Saline Valley is a basin into which drain numerous streams along the east flank of the Inyo Mountains, the north flank of the Nelson Range, and the west flank of the Last Chance Range. In addition, there are numerous dune features associated with the significant aeolian erosion that has occurred in the Saline Valley. A major dune field is located just north of the Salt Lake in the southwestern portion of the Saline Valley (the Saline Valley Sand Dunes).

3.3.2.1 Seismicity

The geology within the Saline Valley, like that of the surrounding region, is the result of uplift associated with extensive faulting that has occurred in recent geologic history. The dominant fault feature in the Saline Valley is the Hunter Mountain Fault, which is located at the toe of the Nelson Range, continuing north along the easterly face of the Inyo Mountains. The Hunter Mountain Fault extends approximately 40 kilometers and has an average slip rate of between 2 and 3 millimeters per year. The four beacon radar alternative sites located on the east-facing Inyo Mountains alluvial fans (Alternatives B through E) are located relatively close to the Hunter Mountain fault, and would be subject to intense ground shaking and possible surface rupture from an earthquake along this fault segment.

Approximately 20 scattered faults underlie the Saline Valley floor, extending in a north-south orientation. These faults, most of which are less than 5 kilometers long, are likely a component of the Hunter Mountain Fault (AFFTC 2002a). The abundant springs, artesian wells, and warm springs indicate the presence of subsurface (buried) faults within the Saline Valley floor. The Alternative A site is located relatively close to these buried faults.

3.4 Water and Hydrology Setting

This section discusses major drainage features in the Saline Valley and the potential for flooding. The sources of water in the planning area include groundwater, artesian wells, and surface water that collects within the Salt Lake, which is actually a playa. The Death Valley region has an average annual rainfall of less than 2 inches. The Saline Valley has an average annual temperature of 76.5 degrees, ranging from 20 to 130 degrees, and an average evaporation rate of 150 inches within the playa areas. Therefore, the Saline Valley has an average annual water deficit greater than 145 inches.

3.4.1 Regulatory Requirements/Guidance

The regulation potentially applicable to water and hydrology in the Valley is the *Clean Water Act* (CWA) (33 USC 1251 et seq.). The CWA, as amended, is designed to restore and maintain the chemical, physical, and biological integrity of surface waters. As such, the CWA establishes effluent standards on an industry-wide basis to address potential water pollution through a permitting system designed to control, and eventually eliminate, water pollution. The *National Pollutant Discharge Elimination System (NPDES)* is the principal Federal program used to control all source discharges of pollution into surface waters. Because the area is located in an enclosed basin that does not cross a State line, there is no CWA jurisdiction or permits required and this Act does not apply to the proposed project.

3.4.2 Surface Hydrology and Flooding

Numerous springs are located along the alluvial fans on both the Nelson and Last Chance Ranges and within the Saline Valley floor. These springs and their locations may be attributed to the local faults. In addition, geothermal (warm) springs are found in the northeasterly portion of Saline Valley. The Saline Valley and the surrounding mountain ranges exhibit four types of springs: higher-elevation springs (generally low-volume discharge springs whose flow rates fluctuate during periods of prolonged drought); mid-elevation springs (generally high-volume constant discharge springs supported by regional groundwater flow systems); low-elevation springs (generally supplied by secondary water from the first two types of springs that has infiltrated the coarse alluvial fan materials and flowed down to the contact of the alluvial fans with the fine-grained playa sediments); and mid-valley springs (generally nonplaya springs resulting from geologic barriers, such as faults, that restrict groundwater movement).

The majority of the water currently supplied to the Saline Valley, except for occasional rainfall, is derived from snowmelt and the mid-elevation springs that are dependent on regional groundwater flows. Since the areas surrounding the Saline Valley also have low annual rates of rainfall, those areas with substantial rates of groundwater recharge are found at significant distances, predominantly in the central highlands of the Great Basin of central and eastern Nevada. The proposed project will be designed to minimize the effects of flash floods through the siting, grading, and diversion structures.

The major surface water feature located in the Saline Valley is the Salt Lake, located in the southwest portion of the Saline Valley. Intermittent streams drain into the floor of the Saline Valley and, ultimately, the Salt Lake. These

streams exhibit a classical dendritic drainage pattern flowing into the Saline Valley floor from the surrounding mountains towards the Salt Lake. These streams drain the east- and north-facing slopes of the Nelson Range, the east-facing slopes of the Inyo Mountains, and the west-facing slopes of the Last Chance Range.

The Saline Valley has not been mapped by the Federal Emergency Management Agency (FEMA) to ascertain the presence of 100- and 500-year flood zones. For this reason, a study was performed to determine the local floodplain delineation (Appendix A). All five beacon radar alternative sites, and the microwave repeater sites, are located above the floodplain elevation.

3.4.3 Groundwater Resources

Groundwater is found within the Saline Valley at varying depth and quality, with the local groundwater basins being recharged through surface and subsurface infiltration. Groundwater is the area's principal source for desert springs, seeps, and streams. The small springs and seeps found within the Saline Valley offer isolated and limited water for plants, wildlife, and domestic use. Some springs produce potable water, but overall, water quality is poor because of the high dissolved solids concentrations. The presence of phreatophytic (deep rooted) vegetation on sites located along the Inyo Mountains' alluvial fans indicate that groundwater levels are relatively shallow in those areas surrounding the Salt Lake.

3.5 Air Quality Setting

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The types and amounts of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing weather conditions determine air quality. The significance of the pollutant concentration is determined by comparing it to Federal and State ambient air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

3.5.1 Regulatory Setting for Air Quality

The *1970 Federal Clean Air Act (CAA)* and the *1990 Clean Air Act Amendments (CAAA)* regulate airborne emissions from both stationary and mobile sources within the Planning Area. Air quality regulations were first promulgated with the passage of the CAA and revised with the CAAA. The Saline Valley is located within the Great Basin Valleys Air Basin. The GBUAPCD is responsible for the enforcement of the CAA's air quality standards for the Saline Valley. The GBUAPCD's jurisdiction includes both Inyo and Mono Counties (California Air Resources Board 1999).

Congress established the *Prevention of Significant Deterioration Program* (42 USC 7401, Part C) as one of the programs designed to implement the CAA. To facilitate implementation of this program, the Environmental Protection Agency (EPA) established the following classification scheme: Class 1 areas refer to those areas receiving the highest degree of protection, with only limited amounts of specific emissions (sulfur dioxide and particulate matter) allowed; Class 2 areas permit moderate increases of certain air pollutants; and Class 3 areas permit larger amounts of new emissions (Congress has yet to designate any Class 3 areas). Death Valley National Park is a designated Class 2 "floor" area, meaning that those areas within the Park boundaries may never be redesignated to Class 3 (California Air Resources Board 1999).

The CAA also provides for the creation of national ambient air quality standards for a number of criteria pollutants. The criteria pollutants include sulfur dioxide, carbon monoxide, total suspended particulates, nitrogen oxides, lead, ozone, and particulate matter less than 10 microns in diameter (PM10). The State of California Air Resources Board (CARB) is also responsible for the enforcement of State standards that are stricter than Federal standards. The State standards also govern emissions for hydrogen sulfide and particulate sulfates. As part of the CAA's implementation, nonattainment areas (National Ambient Air Quality Standard [NAAQS] Nonattainment Areas) throughout the nation have been identified. These nonattainment areas refer to those air basins that have air pollution levels exceeding Federal clean air standards. As a result, the levels of pollution must be reduced within nonattainment areas to reach compliance with the applicable standards.

Federal facilities located in a NAAQS nonattainment area are required to comply with the Federal Air Conformity rules and regulations of 40 CFR 51/93. Under the Federal Air Conformity rules, an agency that initiates a new action (such as the proposed beacon radar facility) must quantify potential air emissions from both stationary and mobile sources that are associated with the proposed project. The calculated emissions are first compared to established de minimis emission levels (based on the nonattainment status for each applicable criteria pollutant in the area of concern) to determine the relevant compliance requirements. If the calculated emissions are equal to or greater than the de minimis levels, then the requirements of the Air Conformity rules apply to the action.

3.5.2 Characteristics of Air Quality in the Region

The nearest EPA-designated nonattainment area for State hydrogen sulfide and particulate sulfate standards is the Searles Valley. This nonattainment area includes the Trona area, where there is a significant amount of soda ash production. The Saline Valley, however, is considered to be in attainment for these two criteria pollutants.

The Saline Valley, which is in the eastern portion of Inyo County, is a designated nonattainment area for PM10 for State standards. The eastern portion of Inyo County has not recorded PM10 emissions in excess of Federal standards (California Air Resources Board 1999). To ensure compliance with all relevant Federal and State air laws, each Air Pollution Control District enacts its own rules and regulations. Local air districts use permits such as "Authority to Construct and Permit to Operate" as one method of implementing these rules and regulations.

Visibility is another important air quality issue within the local air basin, and is the most easily affected by activities that generate dust (especially fine particulates) and sulfur dioxide. Visibility impacts occur from the long-range transport of pollutants from locales as far away as the San Joaquin Valley and the Los Angeles basin (California Air Resources Board 1999). One source of pollution in the region is the Searles Valley (Trona) complex that produces soda ash, borax, potash, and other chemicals from Searles Dry Lake. Other sources of emissions include Owens Lake, the Owens Lake Soda Ash Company, the U.S. Army National Training Center at Fort Irwin, China Lake NAWS, Briggs Mine, and Panamint Valley Limestone Quarry. Air quality monitoring stations in the region are located in Death Valley National Park and at the Briggs Mine (National Park Service 2000).

3.5.3 Characteristics of Air Quality in the Saline Valley

The exposed lakebeds and the playas that comprise the floor of the Saline Valley are the dominant sources of wind-blown dust. Local sources of fugitive dust in the Saline Valley also consist of particulate matter from vehicles using the unimproved routes and mining operations. Site visits into the Saline Valley confirmed the impact of fugitive dust generation from vehicles traveling on the unimproved routes in the area. Fugitive dust emissions were observed during field visits to the Saline Valley from vehicles traveling on Saline Valley Road (Appendix D).

3.6 Biological Resources Setting

Biological field surveys were completed for the five radar and three repeater sites. Pacific Southwest Biological Services, Inc. and JT3/CH2M HILL completed the surveys (Appendix B). The Saline Valley is dominated by playas and areas with extensive alluvial scatter associated with the mass wasting that has occurred in the area. Vegetation within the Saline Valley is generally limited to creosote and other common desert vegetation. However, there are concentrations of other types of vegetation, including hydrophytic vegetation, in the vicinity of the Salt Lake. The Galena Ridge microwave repeater site is situated in Joshua tree and Juniper association on the valley rim, while the other two repeater sites are located on the north end of the valley floor. Limestone, granitic, and other igneous rock materials characterize the geology of the microwave repeater sites. The diversity of rock materials found within the vicinity of the repeater sites is reflected in the site's floral diversity. In general, biological resources include native and introduced plants that comprise the various habitats, the animals that are found in such habitats, and natural areas that help to support plant and wildlife populations.

3.6.1 Regulatory Setting for Biological Resources

The *Endangered Species Act of 1973* (*ESA*) (16 USC 1531–1544) provides the framework for the protection of endangered and threatened species. Federal agencies may not jeopardize the existence of listed species, thus ensuring that actions these agencies may authorize, fund, or carry out do not adversely affect the species or adversely modify designated critical habitats. The ESA prohibits the harming or killing (taking) of a listed species

without authorization. While Federal agencies must consult with the U.S. Fish and Wildlife Service (USFWS) when their activities may affect listed species, projects cannot be stopped unilaterally by the USFWS. However, for any anticipated take to be authorized, applicable measures to minimize the impacts must be followed.

The *Migratory Bird Treaty Act* (*MBTA*) *of 1918* (16 USC 703–712), as amended, provides for Federal protection of all migratory bird species, their active nests, eggs, etc. Permits are required to remove these birds from their natural roosting and nesting areas. Federal agencies must minimize any potential takings caused by their activities. Depredation permits are required from the USFWS prior to removal or disturbance of nesting birds.

The *California Endangered Species Act* (*CESA*) (Fish and Game Code Section 2050 et seq.) generally parallels the main provisions of the Federal ESA, and is administered by the California Department of Fish and Game (CDFG). Under the CESA, the term "endangered species" is limited to species native to California, and is defined as a species of plant, fish, or wildlife that is in serious danger of becoming extinct throughout all, or within a significant portion, of its range. The CESA establishes a petitioning process for the listing of State-threatened or -endangered species, and the CDFG is required to adopt regulations for this process. The CESA prohibits the taking of State-listed species except as otherwise provided in State law. Unlike the Federal ESA, the CESA applies prohibitions to species petitioned for State listing (i.e., State candidates).

3.6.2 Biological Resources – Vegetation

Vegetation within the Saline Valley area is dominated by creosote bush scrub. Creosote bush scrub occurs extensively throughout the Mojave and Sonoran (Colorado) deserts of southeastern California. Few species possess the broad ecological tolerances of creosote bush (*Larrea tridentata*). Therefore, species composition varies widely between creosote bush scrub communities, depending on local conditions. Typical associations of this community include burrobush (*Ambrosia dumosa*), winterfat (*Krascheninnikovia lanata*), cheesebush (*Hymenoclea salsola*), and Nevada tea (*Ephedra nevadensis*). The desert saltbrush scrub communities generally occur on soils that are alkaline, have a high soluble salt content, and have an impervious claypan or caliche layer. These communities are predominant in the vicinity of the Salt Lake. Saltbrush communities are sometimes differentiated by phase: halophytic and arid phases. In addition to the previously mentioned species, desert saltbrush scrub communities within these areas are also dominated by spiny menodora (*Menodora spinescens*) and Shockley's goldenhead (*Acamptopappus shockleyi*).

The vegetation near the Galena Ridge repeater site exhibits considerable taxonomic variation given the survey area's relatively small size. The plant names used in this study follow classification system from the *Jepson Manual Higher Plants of California*, 1993. This variation is due to the complex geology of the area and the influence of subtle differences in elevation and slope. The survey area contains a mixture of Joshua trees (*Yucca brevifolia*) of sufficient number and density to warrant a Joshua tree woodland designation. Interspersed among the Joshua trees are pinyon pines. Understory species include rabbitbush (*Chrysothamnus viscidiflorus*) and the Great Basin sage (*Artemisia tridentata*) (Appendix B).

3.6.3 Biological Resources – Invertebrates

Characteristic invertebrate species in the Saline Valley region include harvester ants (*Pogonomyrmex* spp.), termites (*Isoptera*), creosote bush grasshoppers (*Bootettix argenteus*), desert clicker grasshoppers (*Ligurotettix coquilletti*), Jerusalem crickets (*Stenopelmatus fuscus*), broad-necked darkling beetles (*Coelocnemis californicus*), tiger beetles (*Cicindela* spp.), tarantula hawks (*Hemipepsis* spp.), and desert tarantulas (*Aphonopelma chalcodes*). Butterflies found in the area include Becker's white (*Pontia beckerii*), common sulphur (*Colias philodice*), and the square-spotted blue (*Euphilotes bauri*).

3.6.4 Biological Resources – Vertebrates

Common reptiles found in the Saline Valley's desert scrub habitats include desert spiny lizards (*Sceloporus magister*), side-blotched lizards (*Uta stansburiana*), western whiptails (*Cnemidophorus tigris*), desert night lizards (*Xantusia vigilis*), leopard lizards (*Gambelia wislizenii*), desert horned lizards (*Phyrnosoma platyrhinos*), coachwhips (*Masticophis flagellum*), gopher snakes (*Pituophis melanoleucus*), Mojave rattlesnakes (*Crotalus scutalatus*), chuckwalla (*Sauromalus obesus*), zebra-tailed lizards (*Callisaurus draconoides*), desert iguanas

(*Diposaurus dorsalis*), and sidewinders (*Crotalus cerastes*). Other common reptiles likely to be found in the area include sagebrush lizards (*Sceloporus graciosa*), the Panamint speckled rattlesnake (*Crotalus mitchelli stephnensi*), and the Great Basin rattlesnake.

The variety of desert scrub habitats in the Saline Valley area also supports a diversity of birds. Species that are widespread through all vegetation types include sage sparrows (*Amphispiza belli*), white-crowned sparrows (*Zonotrichia leucophrys*), Brewer's sparrows (*Spizella breweri*), western meadowlarks (*Sturnella neglecta*), ash-throated flycatchers (*Myiarchus cinerascens*), horned larks (*Eremophila alpestris*), and common ravens (*Corvus corax*). Also common in most areas are mourning doves (*Zenaida macroura*), California quail (*Callipepla californicus*), ladder-backed woodpeckers (*Picoides scalaris*), western kingbirds (*Tyrannus verticalus*), cactus wrens (*Campylorhyncus brunneicapillus)*, and sage thrashers (*Oreoscoptes montanus*). Common raptors in the area include red-tailed hawks (*Buteo jamaicensis*), American kestrels (*Falco sparverius*), northern harriers (*Circus cyaneus*), Cooper's hawks (*Accipiter cooperii*), burrowing owls (*Athene cunicularia*), and great horned owls (*Bubo virginianus*). Other raptors include ferruginous hawks (*Buteo regalis*), turkey vultures (*Cathartes aura*), golden eagles (*Aquila chrysaetos*), prairie falcons (*Falco mexicanus*), short-eared owls (*Asio flammeus*), and long-eared owls (*A. Otus*).

Large carnivorous mammals that may be found in the desert scrub communities of the Saline Valley include coyotes (*Canis latrans*), desert kit foxes (*Vulpes macrotis*), and bobcats (*Felis rufus*). Somewhat less common carnivores include gray foxes (*Urocyon cinereoargenteus*), American badgers (*Taxidea taxus*), and mountain lions (*Felis concolor*). Abundant diurnal species include black-tailed jackrabbits (*Lepus californicus*), desert cottontails (*Sylvilagus auduboni*), antelope ground squirrels (*Ammospermophilus leucurus*), and, especially in the vicinity of developed areas, California ground squirrels (*Citellus beecheyi*). Additionally, during field surveys to the Saline Valley, feral burros were observed in those areas located north and west of the Salt Lake.

The desert scrub habitats of the Saline Valley support a diverse assemblage of nocturnal small mammals adapted to the arid conditions. Most abundant among these are Merriam kangaroo rats (*Dipodomys merriami*) and deer mice (*Peromyscus maniculatus*). Other common species include saltbrush-adapted Great Basin kangaroo rats (*Dipodomys microps*), desert kangaroo rats (*D. deserti*), Panamint kangaroo rats (*D. Panamintinus*), little pocket mice (*Perognathus longimembris)*, San Joaquin pocket mice (*P. inornatus*), and carnivorous grasshopper mice (*Onychomys torridus*).

The microwave repeater site near Galena Ridge is at a much greater elevation compared to the other beacon radar site alternatives. The dominant plant community is the Joshua tree woodland interspersed with pinyon pine. Common reptile specie is identified, or expected to occur within the Galena Ridge Site, include the Panamint alligator lizard (*Elgarias panamintina*), sagebrush lizard (*Sceloporus gracious*), western fence lizard (*Sceloporus graciosus*), Gilbert skink, side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), and desert night lizard (*Xantusia vigilis*). Common avian species include the pinyon jay (*Gymnorhinus cyanocephalus*), Clark's nutcracker (*Nucifraga columbiana*), common raven, rock wren (*Salpinctus obsoletus*), chipping sparrow (*Spizella passerina*), sage sparrow, and black-throated sparrow (*Amphispiza bilineata*). Finally, mammals likely to inhabit the area include the desert wood rat (*Neotoma lepida*), Panamint chipmunk (*Eutamias panamintinus*), desert wood rat (*Neotoma lepida*), and mule deer (*Odocoileus hemionus*).

3.6.4.1 Sensitive Biological Resources

Occurrences of several endemic State-listed or Federally listed or otherwise sensitive plants and animals have been reported for the region. The presence of limestone in the Inyo Mountains has resulted in certain endemic plants. The wetlands associated with springs are located at the base of the range and, together with the graben-lake-associated wetlands, result in the presence of adapted or associated plants and animals. Since all of the sites avoid these areas and/or conditions, the potential for impacting these sensitive species or their habitats is considered low for all of the candidate beacon radar and microwave repeater locations. The sensitive biological resources found in the Saline Valley are listed in Table 3-1 and Appendix B.

Table 3-1. Sensitive Biological Resources in the Saline Valley		
Common Name	**Scientific Name**	**Findings**
Plants		
Pygmy Poppy	*Canbya candida*	Not Federally listed, but because it is listed as rare, threatened, or endangered in California and elsewhere under the California Native Plant Society, California Environmental Quality Act (CEQA) consideration is mandatory. Sandy places, 600–1,200m – not observed. Cited at elevations
Ripley's Cymopterus	*Cymopterus ripely*	Not Federally listed, but because it is listed as rare, threatened, or endangered in California but more common elsewhere under the California Native Plant Society, CEQA consideration is mandatory. Sandy soils, 1,000–1,600m – not observed. Range is to the south, in the Coso Range.
Sand Linanthus	*Linanthus arenicola*	Federally listed as too widespread and/or not threatened, not State listed, but listed as rare, threatened, or endangered in California but more common elsewhere under the California Native Plant Society. Saline flats, gypsum, 800–1,400m - habitat not present at any candidate sites.
Sagebrush Loeflingia	*Loeflingia squarrosa* var, *artemisianum*	Federally listed as too widespread and/or not threatened, not state listed, but listed as rare threatened or endangered in California and elsewhere under the California Native Plant Society. Sand dunes and sandy flats - not observed at any candidate sites.
Inyo Rock Daisy	*Perityle inyoensis*	Federally listed as a *Special Concern Species*, not state listed, but listed as rare threatened or endangered in California and elsewhere under the California Native Plant Society. Inyo Mountains slopes, 1,200–2,500m – no canyon slope habitat present at any candidate sites.
Hanaupah Rocky Daisy	*Perityle villosa*	Federally listed as a *Special Concern Species*, not state listed, but listed as rare threatened or endangered in California and elsewhere under the California Native Plant Society. Dry rocky slopes, 1,200–2,600m – no limestone habitat present at any candidate sites.
Small-flowered Ricegrass	*Pipatherum micranthum*	Not Federally listed, but because it is listed as rare threatened or endangered in California but more common elsewhere under the California Native Plant Society, CEQA consideration is mandatory. 700–2,950m – not observed at any candidate sites.
Desert Popcorn-flower	*Plagiobotrys salsus*	Not Federally listed, but because it is listed as rare threatened or endangered in California but more common elsewhere under the California Native Plant Society, CEQA consideration is mandatory. Alkaline mud flats – not observed at site D-2, the only potential site.
Invertebrates		
Saline Valley Beetle	*Ployphylla ateronivea*	No habitat at any candidate sites.
Amphibians and Reptiles		
Inyo Mountains Slender Salamander	*Batachoseps campi*	

Source: Pacific Southwest Biological Services 2000

3.7 Noise Setting

Noise levels are typically measured using the decibel (dB) scale, where 0 dB represents the threshold of hearing up to levels where permanent damage can occur. Measurement scales are complicated because they must reflect sensitivity to noise at different times of the day. For example, noise levels that are not perceived to be a problem during daytime hours are often troublesome during the late evening and early morning hours, when people are sleeping and more sensitive to noise. As a result, noise scales are generally weighted to reflect increased sensitivity to noise at different hours of the day (e.g., "dBA" indicates decibels weighted on the A scale). Figure 3-1 illustrates the decibel acoustical scale and some typical noise levels associated with various activities.

The most commonly used units for measuring the level of noise include the dB and the Day-Night Average Noise Level (DNL). The DNL is based upon 24 one-hour equivalent continuous sound level (Leq) measurements. The DNL levels for the late evening and early morning hours (the period between 10:00 p.m. and 7:00 a.m.) are weighted 10 decibels to compensate for the fact that people are more sensitive to noise during the nighttime and early morning periods than at any other time.

Human sensitivity to certain types of noise over other types of noise further complicates the understanding of the effects of noise on individuals. For example, continuous sounds may not be perceived as annoying as periodic sounds that elicit a startled response. Individuals living near a freeway or busy road may adjust to the sound of continuous traffic noise over a long period of exposure. The distance of the noise source from the receptor may also influence noise levels from a specific noise source. However, a periodic siren or low-flying jet is likely to create an annoyance.

3.7.1 Regulatory Setting for Noise

The *Federal Interagency Committee on Urban Noise* (1980) has developed land use compatibility guidelines for noise and provides recommended DNL ranges for various land use categories based on this committee's findings. The DNL values of 65 dB and less are generally compatible with all types of land uses. Residential, public, and some types of recreational land uses (e.g., outdoor music amphitheaters, nature reserves) are generally not considered compatible with yearly DNL ranges greater than 65 dB. Commercial, industrial, and other types of recreational land uses (e.g., sports arenas, golf courses, amusement parks) are generally considered compatible with yearly DNL ranges between 70 and 75 dB, if measures are incorporated into the design and construction of structures associated with these land uses. Some transportation (e.g., railways, airports) and manufacturing land uses (e.g., mining, nonlivestock agriculture, fishing, and forestry) can tolerate yearly DNL ranges in excess of 85 dB.

3.7.2 Ambient Noise Environment in the Saline Valley

Vehicle noise is generally not an issue in the Saline Valley in spite of the many and heavily used roads found elsewhere in the Death Valley National Park, including State Highways 127, 190, and 178, and NPS major paved roads. The primary vehicular access into the Saline Valley is provided by Saline Valley Road, which is an unimproved dirt road that carries limited traffic. Ambient noise levels taken near the Salt Lake area were below 35 dBA when field measurements were taken (Panacea, Inc. 1999).

During site visits, ambient noise levels were measured throughout the Saline Valley. Overall, the ambient noise environment was generally quiet, well below 45 dBA, largely due to the remoteness of the area and the lack of any significant ground-borne sources of noise. Aircraft operations in the area were a contributor to noise in the Saline Valley. The aircraft noise levels varied considerably, depending on the speed, distance, and altitude of the aircraft observed.

The Saline Valley is located in the vicinity of a number of DOD facilities, including the Fort Irwin Military Reservation, China Lake NAWS, and Nellis Air Force Base, where low-level military overflights are common. Military aircraft from these facilities and Edwards Air Force Base often use airspace in the Saline Valley, and overflights constitute a source of high-level noise incidents. The Saline Valley is located within a designated Military Operations Area (MOA) that permits high performance military aircraft to fly at low altitudes.

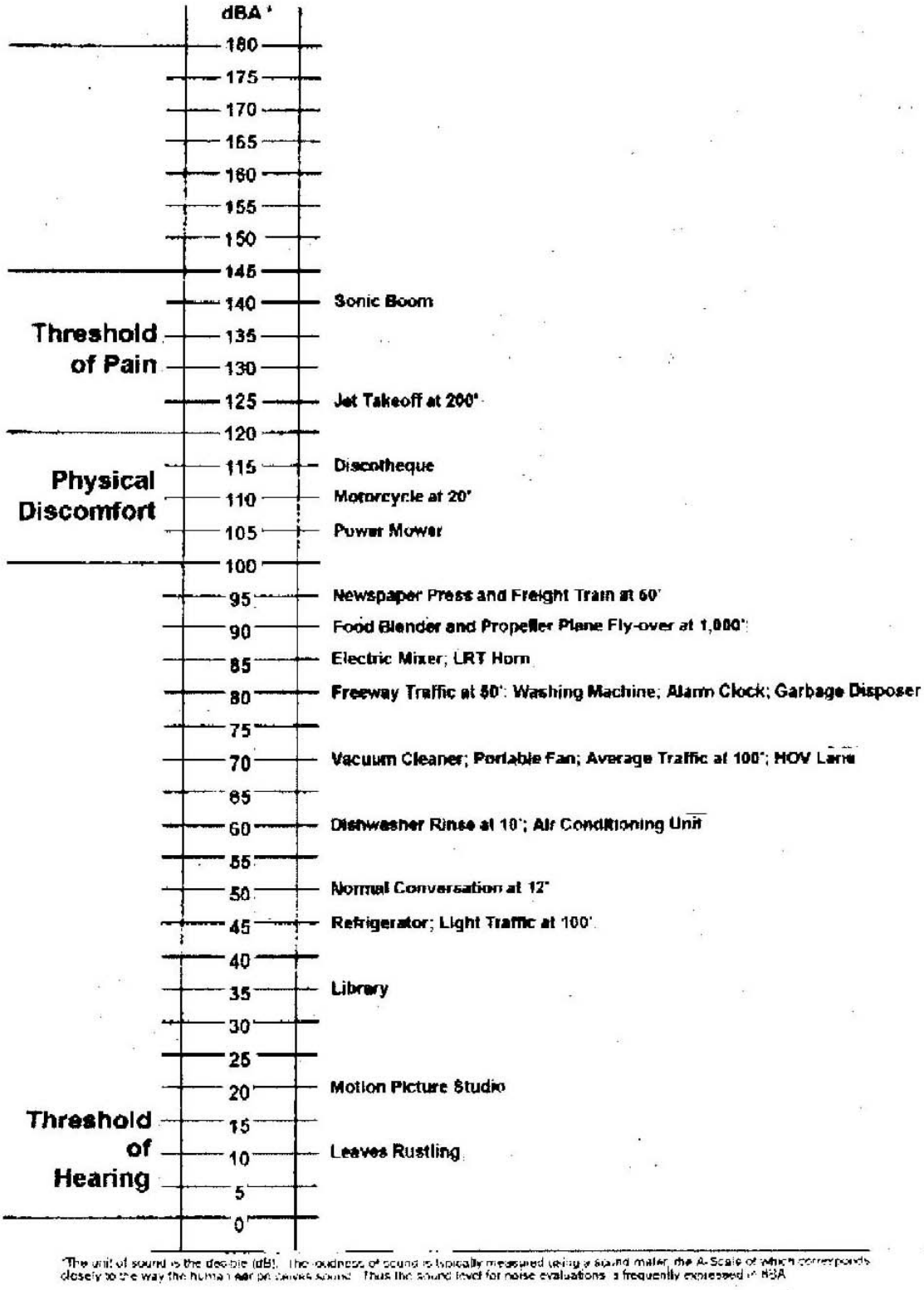


Figure 3-1
Characteristic Noise Levels
Source: Environmental Protection Agency

3.8 Cultural Resources Setting

This section describes the existing environmental setting of the proposed locations, with respect to archaeological and historic resources. The results of cultural surveys and documentation of the American Indian consultation process are provided in Appendix C. Potentially significant sites in the Saline Valley are largely associated with transportation corridors, water sources, and mining operations that occurred during the late 19th and early 20th centuries. While the majority of the Saline Valley remains to be surveyed, the overall cultural sequence for the Saline Valley and the surrounding area is well documented (National Park Service 1977).

3.8.1 Regulatory Requirements/Guidance

The *National Historic Preservation Act (NHPA) of 1966,* as amended (16 USC 470 et seq.), provides for the establishment of the National Register of Historic Places and authorized the establishment of criteria to determine the eligibility of cultural sites for listing on the National Register. Section 106 of the NHPA requires Federal agencies to evaluate the effects of their activities and programs on eligible cultural resources (which include prehistoric and historic archaeological resources, historic resources, and traditional cultural places). Section 110 of the NHPA directs Federal agencies to undertake actions necessary to minimize harm to cultural resources under their ownership or control, or affected by their activities and programs. The *Archaeological Resources Protection Act (ARPA) (16 USC 469)* was intended to address the growing concern regarding the plundering of archaeological and historic sites. The Act makes it illegal to remove any archaeological resources from Federal or Indian lands without a permit.

The *Native American Graves Protection and Repatriation Act (NAGPRA)* (25 USC 3001 et seq.) requires Federal agencies and institutions (e.g., museums) that receive Federal funding to inventory their collections of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. American Indians must be given the opportunity to reclaim these items. The Act also requires consultation with American Indians regarding the avoidance of archaeological burial sites. This regulation requires halting excavation and other construction activities in the event that resources are encountered, and consultation with representatives of local American Indian groups if a burial is encountered in the course of archaeological or other excavations. The Act also makes it illegal for anyone to buy or sell American Indian human remains or sacred objects.

The *Archaeological and Historic Preservation Act of 1974* requires all agencies to report to the Secretary of the Interior if any of their projects may cause the loss of significant scientific, prehistoric, historic, or archaeological data, gives them the choice of recovering threatened data themselves or asking the Department of the Interior to do it for them; and authorizes them to transfer up to 1% of the cost of the project to the Department of the Interior to support salvage.

The *American Indian Religious Freedom Act* (*AIRFA*) (42 USC 1966) recognizes and protects the religious freedoms of American Indians as an integral part of their culture, tradition, and heritage. The Act preserves the right of American Indians to access sacred sites, to use and possess sacred objects, and to freely worship through ceremonial and traditional rites. AFI 32-7065, *Cultural Resources Management*, defines cultural resources as any historical, archaeological, or American Indian artifacts and properties of interest.

3.8.2 Archaeological Resources in the Region

The prehistoric chronology for the Saline Valley is divided into five periods: Death Valley I or the Paleo-Indian Period (9,000 to 7,000 years before present [BP]); Death Valley II or the Desert Archaic Period (5,000 to 1,500 years BP); Death Valley III or the Early Ceramic Period (1,500 to 1,000 years BP); Death Valley IV or the Later Ceramic/Shoshonean Period (1,000 to 130 years BP); and the Ethnohistoric Period (130 years BP to present). Potential prehistoric sites in the Saline Valley and in the surrounding region include caves, rockshelters, lithic scatters, trails, temporary camps, milling stations, quarries, rock art, hunting blinds, villages, cemeteries, and rock alignments. Dwellings erected by the Shoshone in Saline Valley were photographed during historic times.

According to ethnographic information, the Saline Valley and the nearby Death Valley are located within the southern tip of the traditional Western Shoshone territory and the western margin of Owens Valley Paiute lands. The Saline Valley is also located within traditional use areas of the Panamint Shoshone, ancestors of the Timbisha Shoshone, and may also be inhabited by the Owens Valley Paiute. The Panamint Shoshone often used sites within the Saline Valley for ritual purposes, hunting, and food collecting activities. American Indian resources associated

with the Saline Valley include rockshelters, rock art sites, occupation sites, rock features, quarries with associated trails, springs, hunting blinds, ritual healing locations, and ceremonial areas.

Proximity to fresh water and food resources was the primary variable influencing American Indian site habitation. For example, a water source (springs) within or near a food source (a mesquite grove) would be an optimal location for a habitation or food collection site. An alluvial fan generally lacks resources and would not have been a primary occupation or food collecting and processing site, but may have been the location of food storage facilities or a temporary campsite, trail, burial site, or rock art site. There is a high archaeological sensitivity in those areas located near the numerous springs found in the Saline Valley floor and in the canyons of the Nelson and Last Chance Ranges.

Mapped data that indicates the American Indian territorial boundaries within California does not identify any American Indians in the vicinity of the Saline Valley, but limits the identifications to those areas west of Death Valley and western sides of the Saline Valley's bordering mountains (the Nelson Range). More recent research, however, has identified the Saline Valley area as one associated with the Panamint Shoshone during late historic times. (circa 1870s and 1880s) (Volume 11, Great Basin of the Handbook of North American Indians). It has been suggested that the populations within the Saline Valley were low and generally present during winter months. Only four village sites are known to have been present within the Saline Valley.

Within Township 14 South, Range 38 East, Section 22 northwest quarter, BLM documentation notes a cash entry for 1891 (Patent 504), suggesting the beginning of the salt-works in the area. Other entries include an Indian Allotment (80 acres; Patent 1136465) and other American Indian claims. The BLM also has jurisdiction over portions of Section 22.

Previous research for the project areas was completed at the University of California, Riverside, Eastern Information Center (UCR-EIC), the Eastern California Museum at Independence, and the regional repository for archaeological data for Inyo County. Limited archaeological resources were identified in the vicinity of the eight proposed alternative sites, with no archaeological resources found on the proposed sites.

The UCR-EIC research showed that no sites were reported for three beacon radar alternative sites (Alternatives A, C, and D). However, subsequent to the completion of this research, BLM Archaeologist Judyth Reed stated that two BLM alternative sites (Alternatives C and D) were previously surveyed and no resources were identified in either area. The Alternative A site was recently surveyed by NPS Archaeologist Timothy Canaday, which also yielded negative findings. CH2M HILL Archaeologist Barry Boyer surveyed Alternatives B and E, also yielding negative findings.

The Lead Canyon repeater sites were surveyed by CH2M HILL Archaeologist Barry Boyer and yielded negative findings. McKenna et al. (Appendix C) investigated the Galena Ridge repeater site and determined that no prehistoric or historic resources were present at the site or along the access road.

3.8.3 Historic Resources

A single historically significant site located within the Saline Valley is included on the National Register of Historic Places. The Saline Valley Salt Tram was added to the Register on December 31, 1974. Remnants of this tram are visible south of the Salt Lake. Some of the mines found along the eastern face of the Nelson Range may be considered important historic resources pending future surveys.

3.9 Traffic Setting

The traffic and public facilities within the Saline Valley are limited to Saline Valley Road, a county road. The Saline Valley does not contain water, sewer, and power lines found in most urban and rural areas. No permanent public service facilities (e.g., schools, police and fire services) are found in the Saline Valley. Campsite areas near the minimally developed Palm Spring and Warm Spring sites are present. Scattered dwellings around the Salt Lake and mines, and Willow Creek Camp also exist within the valley.

Regional access to the Saline Valley is provided by Big Pine Road (State Route 168) on the north and Darwin-Olancha Road (State Route 190) on the south. Both of these paved roadways connect with U.S. Highway 395 and provide the primary means of access to Death Valley National Park from the west. Saline Valley Road serves as the primary means of access into the Saline Valley. This roadway traverses the Saline Valley in a north-south orientation, connecting with the paved highways to the north and south. Numerous smaller unimproved routes, in varying condition, traverse the Saline Valley, though all of these routes ultimately connect with Saline Valley Road.

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Approach Used in the Analysis of Impacts

This section analyzes the predicted environmental impacts associated with the Saline Valley Beacon Radar Facility Project. The analysis begins with an assessment of the five proposed beacon radar facility alternatives (Alternatives A through E) and Alternative F (the No Action alternative). In addition, this section analyzes the environmental impacts of proposed microwave repeater facilities that will be required in conjunction with the beacon radar alternatives. The environmental analysis considers the following environmental issue areas: land use and aesthetics, earth and geology, water and hydrology, air quality, biological resources, noise, cultural resources, and traffic and infrastructure. No impacts to recreational values other than visual were identified; therefore, visual and recreational impacts are addressed together.

This section is organized to facilitate comparison of impacts associated with implementation of the various action alternatives, in addition to the No Action alternative. The analysis of impacts begins with identification of the thresholds that were referred to in determining whether there is potential for significant adverse impacts. For a number of alternatives, an overview of the methodology used is also indicated. Finally, a matrix is used to compare impacts of the various alternatives and any proposed mitigation.

A matrix is provided for each issue area examined in this EA. The five beacon radar alternative site locations are first discussed, followed by a discussion of the No Action alternative and mitigation measures. Because all of the beacon radar site alternatives require the use of a microwave repeater to provide a clear line-of-transmission with the existing FAA communications facility located on Keeler Peak, the impacts related to the installation of a microwave repeater will apply to all beacon radar alternatives. The three candidate microwave repeater sites are discussed individually.

Based on this analysis, there were no significant adverse impacts identified for any of the alternatives considered.

4.1.1 Land Use/Socioeconomic Impacts of the Proposed Project

The primary land use impacts associated with implementation of the action alternatives (the beacon radar and microwave repeater) are related to the introduction of structures, antenna, and ancillary improvements into areas with minimal development and with a visually intact natural character. The beacon radar antenna radome would be approximately 50 feet high. The repeater site would occupy a footprint consisting of less than 200 square feet. An important criteria used in the selection of candidate beacon radar sites was the proposed site's visibility from Saline Valley Road. All five alternative beacon radar sites are located within, or near, disturbed areas, with varying degrees of visibility and opportunities for concealment (see photo simulations presented in Section 2.0). All of the proposed sites for the microwave repeater are located within 50 feet of existing roads. Four of the five beacon radar sites would be located on BLM land designated for multipurpose use. The BLM Field Office, Ridgecrest, California, as part of the proposed project's early consultation effort, determined that all four alternatives are consistent with the multi-use designations and are in conformity with the BLM Management Plan for this area (BLM 2001a).

The land area required to accommodate the proposed beacon radar facility will be the same for all five alternatives. Less than 1 acre would be needed for the proposed beacon radar complex. Installation of the beacon radar facility would require a staging area for construction equipment and materials storage. This staging area, consisting of approximately 1/3 acre within the approximately 3-acre surveyed area for each site, would use the adjacent unimproved routes where feasible. The small footprint repeater sites are also located on nonwilderness NPS lands. The proposed microwave repeater sites are located near existing roads or in an area that has undergone disturbance.

The potential impacts of the proposed project on land use are presented in Table 4-1.

4.1.1.1 Visual and Recreational Resource Impacts of the Proposed Project

The primary visual and recreational resource impacts associated with implementation of the action alternatives (the beacon radar and microwave repeater) are related to the introduction of structures, antenna, and ancillary improvements into areas with minimal development. Based on preliminary visual analysis, while certain

Table 4-1. Local Land-Use Compatibility Impacts		
Land Use Impacts	**Consistency with Land Use**	**Visual and Recreational Resource Impacts**
Alternative A (Central Saline Beacon Radar Alternative)		
No sensitive land uses are located in the immediate area that would be impacted by short-term construction or operational noise. No campgrounds, hiking trails, or other recreational facilities are located within 0.5 mile of this alternative site. In addition, no such developments are being contemplated by the NPS for the alternative site at this time.	The alternative site, in nonwilderness area, is separated from the designated wilderness area by a fence. The unimproved access route that connects this site with Saline Valley Road is located outside designated wilderness areas. The proposed development site would not encroach into this wilderness area. DOT 4(f) requirements apply to this alternative. This is the technically preferred alternative; however, since there are feasible and prudent alternatives, a positive DOT 4(f) finding is not likely to be justified.	This site exhibits superior opportunities for concealment given its distance (1.25 miles) from Saline Valley Road and the nearby vegetation. From Saline Valley Road, views of the facility would be limited to the radome located at the top of the antenna structure. Most of the security lighting would be concealed from view. Lighting would be restricted to motion-activated security lighting. No aircraft safety lighting is required or would be provided on the antenna structure since the structure is 50 feet or less in height. This security design applies to all alternatives.
Alternative B (McElvoy Canyon Beacon Radar Alternative)		
Plans are to use the track made by construction vehicles (at contour, with no improvements) to access the site from the Saline Valley Road.	The Alternative B site, in nonwilderness area, is located west of Saline Valley Road, within the jurisdictional boundaries of the Ridgecrest BLM Field Office, in an area designated for multipurpose use. The designated BLM wilderness areas are located further west along the toe of the Inyo Mountains. Installation of the beacon radar within this site is consistent with long-range land use plans.	The beacon radar facility would be visible from Saline Valley Road on the northerly and southerly approaches. The visual and recreational resource impacts of this site are considered to be moderate compared to some of the other beacon radar facility alternatives because of its proximity to Saline Valley Road.

Table 4-1 (Continued). Local Land-Use Compatibility Impacts		
Land Use Impacts	**Consistency with Land Use**	**Visual and Recreational Resource Impacts**
Alternative C (Grey Eagle Mine Beacon Radar Alternative)		
The selection of this alternative would not result in displacement impacts, nor would it be incompatible with the limited development in the area (Grey Eagle Mine).	This alternative site is located in nonwilderness area. The designated BLM wilderness areas are located further west along the toe of the Inyo Mountains. Installation of the beacon radar within this site is consistent with long-range land use plans.	The site's visibility from Saline Valley Road is limited because of its distance and topography in relation to the road. However, the antenna structure and modular buildings would be visible from the route leading to Grey Eagle Mine. There are no opportunities for concealment with vegetation. Security lighting at this location, when activated, would also be visible from most areas within this portion of the Saline Valley.
Alternative D (Keyes Canyon Beacon Radar Alternative)		
Historic impacts include scattered debris and refuse from previous human activity and the introduction of exotic plant species. The site is located within a turn-around area for vehicles and has extensive impacts from vehicle use.	This alternative site is in nonwilderness area. The designated BLM wilderness areas are located further west along the toe of the Inyo Mountains. Selection of this site would not conflict with any existing management plan.	The facility would be visible from Saline Valley Road, though the site's 0.7-mile distance from the roadway would lessen the degree of impact. There are no opportunities for concealment with vegetation. Security lighting at this location, when activated, would be visible from most areas within this portion of the Saline Valley.
Alternative E (Keyes Canyon North Beacon Radar Alternative)		
The Salt Lake, the surrounding marshlands, and the nearby mountains dominate the local views from the site looking toward the southeast. Plans are to use the tracks made by construction vehicles (at terrain contour, with no improvements) to access the site from the Saline Valley Road.	This alternative site is not located within a designated BLM wilderness area. The designated BLM wilderness areas are located further west along the toe of the Inyo Mountains. Installation of the beacon radar within this site would not conflict with any long-range management plan.	The beacon radar facility would be visible from Saline Valley Road on the northerly and southerly approaches. The visual and recreational resource impacts of this site are considered to be moderate compared to some of the other beacon radar facility alternatives, because of its proximity to Saline Valley Road. Security lighting at this location, when activated, would be visible from most areas within this portion of the Saline Valley.

Table 4-1 (Concluded). Local Land-Use Compatibility Impacts		
Land Use Impacts	**Consistency with Land Use**	**Visual and recreational Resource Impacts**
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Land Use Mitigation Measures (Alternatives A through E)		
No mitigatable impacts were identified.	No mitigatable impacts were identified.	While not required, the modular structures, antenna, radome, solar array structure, and ancillary facilities would be painted in natural earth-tone colors as a means to reduce the facility's visibility. Bright colors and polished metallic surfaces would be kept to the needed minimum. Security and safety lighting would be motion-activated. (No permanent exterior lighting would be installed, and obstruction clearance lighting is not required on the antenna structure.) Motion activated lighting reduces the potential for adverse impacts related to light and glare.

of the alternative sites are located closer to the primary viewing area of Saline Valley Road, others are located some distance away, further mitigating impacts to visual resources (AFFTC 2002b) (Appendix F). Recreational uses near the proposed sites along Saline Valley Road are limited, consisting primarily of vehicle-based sight-seeing (primarily from Saline Valley Road) and very occasional instances of primitive camping (typically vehicle-based camping at road-accessible spots near the Inyo Mountains). In addition, Saline Valley Road is sparsely used, particularly in the hot summer months. The project is not expected to significantly affect existing recreational activities.

After review of the agency EA draft, the potential for visual impacts were further investigated because of concerns expressed by J. T. Reynolds, Death Valley Park Superintendent, in a letter dated April 21, 2003. The potential to intrude on the views from Saline Valley Road, from the Galena Ridge area road, and from NPS wilderness areas were investigated by installations of a full-scale mock-up repeater station at the Galena Ridge site. This supplemental analysis was undertaken to provide a focused assessment of the potential visibility and visual impacts of a Galena Ridge repeater facility. Based on the analysis of the full-scale mock-up test, it was determined that the Galena Ridge repeater facility would have "virtually no detectable effects on views from Saline Valley" (AFFTC 2003) (Appendix F). By locating the repeater at a site set back slightly from the ridge crest, the repeater facility would not be visible from the portions of the Saline Valley Road in closest proximity to it. The closest valley area from which the repeater would be potentially visible would lie approximately 4.8 miles from the repeater site. From this area, the repeater would "appear as a small speck on the top of the ridge and would not be distinguishable as a man-made structure."

4.1.2 Environmental Justice

This action has been reviewed in accordance with EO 12898. Given the lack of a permanent population in the Saline Valley, the temporary nature of the construction, and the unmanned facility, the Federal agencies with jurisdiction by law have determined that this project has no substantial, disproportionate impacts to minority and low-income populations.

4.2 Geology and Soils Impacts of the Proposed Project

The environmental effects on geology and soils of the beacon radar alternatives (Alternatives A through E) are discussed in this section. The beacon radar alternatives would involve the disturbance of 35,000 square feet for the beacon radar installation and require an additional 16,000 square feet for the staging area. The construction and operational parameters for the proposed beacon radar facility would be similar for all five beacon radar sites with regard to site preparation and grading.

The following worst-case scenario applies to a beacon radar constructed on any of the candidate sites. The actual volume of excavation and fill may vary depending on a future foundation design that is influenced by the type of soil. The footprint, facility layout, and shape are similar for each alternative. Grading and excavation would be limited to the development of a 35,000-square foot site, and the short-term (during construction) disturbance of a 16,000-square foot staging area. The fill and gravel needed to build up the site would be taken from government-approved sources. Limited import of fill/gravel is anticipated for any site (approximately 350 cubic yards). Installation of the pylons and foundations would require the excavation of up to 80 cubic yards of earth that would be spread throughout the site. Because the improvements would be mounted on pylons and foundations, the amount of grading and import required to accommodate the improvements would be limited. Mitigation has been incorporated into the design to ensure that the staging area is permitted to return to its predevelopment condition. Revegetation is not recommended by either of the land management agencies.

The potential impacts of the various alternatives on geology and soils are summarized in Table 4-2.

4.3 Water and Hydrology Impacts of the Proposed Project

The environmental effects of the individual alternatives on hydrology are discussed in this section. The construction and operational parameters of the proposed beacon radar facility would be similar for all five beacon radar alternative sites with regard to site preparation and grading. Structures will be designed to meet the requirements of Seismic Zone 4 to include provisions for secondary containment in the battery storage area. The project engineer would determine the exact elevation of the site and height of the tower during the design phases.

Table 4-2. Geology and Soils Impacts		
Seismic Impacts	**Soils and Mineral Resources Impacts**	**Grading and Excavation Impacts**
Alternative A (Central Saline Beacon Radar Alternative)		
Due to the small size of the proposed action, no seismic impacts are expected.	The soils of this site differ in composition to those of the other four alternatives. This area exhibits alkaline soils that would require compaction and preparation prior to site development. The onsite soils do not represent a significant constraint, given the nature of the proposed facility. No mineral extraction activities are permitted within this area and none would occur with the proposed alternative.	Limited to site development.
Alternative B (McElvoy Canyon Alternative)		
Due to the small size of the proposed action, no seismic impacts are expected.	While the soils on this site are suitable for development, some import would be required to raise the proposed building pad. No mineral extraction activities were found on the site, though some historic mining activities have occurred in the general area.	Limited to site development.
Alternative C (Grey Eagle Mine Beacon Radar Alternative)		
Due to the small size of the proposed action, no seismic impacts are expected.	This alternative site is also located west of Saline Valley Road and northeast of Grey Eagle Mine. Soils within this site were formed from the mass wasting of the nearby mountains, and consist of igneous and metamorphic rock debris. The soils that underlie the site do not appear to represent a constraint to development, pursuant to current plans. No mineral extraction activities are found onsite, though some historic mining activities have occurred in the nearby area, at the Grey Eagle Mine.	Limited to site development.

Table 4-2 (Concluded). Geology and Soils Impacts		
Seismic Impacts	**Soils and Mineral Resources Impacts**	**Grading and Excavation Impacts**
Alternative D (Keyes Canyon Beacon Radar Alternative)		
Due to the small size of the proposed action, no seismic impacts are expected.	Soils within this site make up the underlying alluvial fan formed from the mass wasting of the nearby mountains, and consist of igneous and metamorphic rock debris. While the soils are suitable for development, some import would be required to raise the proposed building pad. No mineral extraction activities are found onsite. No mineral extraction activities are associated with the proposed project.	Site development and some minor excavation and improvement to the access route connecting the site to Saline Valley Road would also be required.
Alternative E (Keyes Canyon North Beacon Radar Alternative)		
Due to the small size of the proposed action, no seismic impacts are expected.	While the soils are suitable for development, some import would be required to raise the proposed building pad and elevate the site. No mineral extraction activities are found onsite.	Limited to site development.
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Geology and Soils Mitigation Measures (Alternatives A through E)		
No mitigatable impacts were identified.	No mitigatable impacts were identified.	The area used for construction equipment storage and staging, consisting of approximately 16,000 square feet for the beacon radar facility, would be permitted to return to its “predevelopment state” once construction is completed for Alternatives A and D. The construction staging area would include the adjacent roadways where possible.

For the microwave repeater sites, no supplemental cooling would be required because of their elevation. Based on an initial assessment of the site and the 2002 floodplain study (Appendix A), none of the beacon radar sites or planned access routes would be located in a floodplain. Site investigations revealed no indicators of wetland areas associated with the proposed sites or planned access routes.

The facility would require the installation of pylons and foundations to support the proposed improvements. The supporting pylons for the solar structure would extend up to 10 feet into the ground, while the antenna supports may extend up to 30 feet below the ground surface. The modular buildings and antenna would be elevated (using pylons and foundations) to avoid the potential for ponding impacts. None of the concrete pylons or foundations contains materials that would contaminate groundwater. The size of the pylons and foundations is such that there would not be any impact to groundwater flow. No groundwater extraction is associated with the proposed project's operation.

The potential impacts of the alternatives on water and hydrology are summarized in Table 4-3. Potential impacts are categorized according to the following:

- The project's potential for impacting bodies of surface water (including the Salt Lake), springs, and intermittent streams;
- Exposure of facilities to flooding or flood-related impacts; and
- The project's potential for affecting the flow or quality of groundwater.

4.4 Air Quality Impacts of the Proposed Project

The NEPA requires an analysis of potential air quality impacts associated with a proposed action. In order to determine the significance of potential air quality impacts, a set of thresholds has been established for peak daily and annual average concentrations for specific criteria pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulates of PM10, and reactive organic gases (ROG). Emissions below the threshold levels are assumed to present no threat to ambient air quality. However, a proposed action that would generate emissions in excess of the threshold limits would require mitigation as a means to reduce potential emissions to levels below the thresholds considered to be significant.

The construction and operational parameters of the proposed beacon radar facility would be similar for all five sites with regard to site preparation and grading. As a result, short-term construction impacts associated with onsite preparation would be comparable for all five beacon radar facility scenarios. Offsite short-term construction emissions among the five alternatives would vary somewhat due to the nature and extent of roads providing access to the individual sites, and the offsite emissions are largely associated with fugitive dust generated during the transport of construction equipment. The relatively small size of the microwave repeater site's footprint (200 square feet) would result in negligible construction-related impacts.

The potential short-term (construction-related) fugitive dust impacts associated with the beacon radar facility's installation are summarized in Table 4-4. The calculations of short-term construction emissions assumed that up to 350 cubic yards of fill would be required to elevate the beacon radar sites. Up to approximately 90 cubic yards of concrete would be transported to the beacon radar site from the Owens Valley. The analysis summarized in Table 4-4 represents the worse case scenario due to the length and condition of the access route to Alternative A.

The proposed beacon radar facility's primary source of power would be provided by electricity generated by the solar power equipment. Propane-fueled generators would provide standby power. As a result, long-term operational on-site emissions would be limited to emissions from the propane-powered generator. While the specific power requirements are not precisely known at this time, preliminary estimates indicate that a generator with a 75-kilowatt (kW) design is appropriate. Operational emissions associated with the use of the propane back-up generator would be comparable for all five beacon radar alternatives. A review of commercial generators corresponding to these specifications was completed to determine the nature and extent of emissions. Table 4-5 summarizes projected emissions for the key criteria pollutants. As indicated in Table 4-5, these emissions would be below thresholds considered to be significant. The generator is a back-up power source, and is estimated to operate less than 120 hours per year, with peak usage occurring during the warmer summer months.

Table 4-3. Water and Hydrology Impacts		
Surface Water Impacts	**Flooding Impacts**	**Groundwater Impacts**
Alternative A (Central Saline Beacon Radar Alternative)		
While the soils in the area exhibit alkaline characteristics, indicating the potential for periodic inundation, no hydrophytic (wetland) plant indicators are found within the site. A man-made well is located behind a fence and gate approximately 500 feet northeast of the site. This feature would not be impacted by the proposed facility since it is located outside of the development area. No wetlands or intermittent streams are within the site or the planned staging area.	This alternative site is located north of the Saline Marsh, outside of a designated flood zone area. The soils indicate that periodic inundation may occur during periods of intense rainfall. The proposed improvements would be elevated on pylons to avoid potential localized ponding impacts. The site would be prepared to facilitate drainage and prevent flooding.	No impacts are anticipated.
Alternative B (McElvoy Canyon Beacon Radar Alternative)		
This alternative site, west of Saline Valley Road, is situated on the alluvial fan east of McElvoy Canyon. The proposed facility would be designed to minimize impact on drainage features in the area. The site is located outside of any drainage or potential inundation area. No wetland areas are located within this alternative site's boundaries or in the immediate area. The nearest spring is located 1.25 miles northwest of this site.	This alternative site is on an alluvial fan near the east-facing toe of the Inyo Mountain Range. The proposed improvements would be located on pylons or foundations elevated above the ground to provide adequate drainage.	No impacts are anticipated.
Alternative C (Grey Eagle Mine Beacon Radar Alternative)		
This site is approximately 0.5 mile southeast of a major drainage channel east of Saline Valley Road, but outside of any drainage or potential inundation area. No surface water bodies or other hydrologic features are located within the alternative site's boundaries or in the immediate area.	This alternative site is located on a relatively undisturbed outwash alluvial fan with a braided stream channel system located on the periphery. The site's substrate is a mixture of erosion products from the adjacent slopes of the Inyo Range, largely granitic and metamorphic quartzite material. The proposed improvements would be located on pylons and foundations elevated above the ground to provide adequate drainage.	No impacts are anticipated.

Table 4-3 (Concluded). Water and Hydrology Impacts		
Surface Water Impacts	**Flooding Impacts**	**Groundwater Impacts**
Alternative D (Keyes Canyon Beacon Radar Alternative)		
This alternative site, west of Saline Valley Road, is situated on the alluvial fan east of Pat Keyes Canyon. This site is approximately 400 feet northeast of, and downslope from, Badwater Springs. The site is located outside of any drainage or potential inundation area. No springs or wetland areas are located within this alternative site's boundaries or in the immediate area.	This alternative site is on an alluvial fan near the east-facing toe of the Nelson Range. The proposed improvements would be located on pylons and foundations elevated above the ground to provide adequate drainage.	No impacts are anticipated.
Alternative E (Keyes Canyon North Beacon Radar Alternative)		
This alternative site, west of Saline Valley Road, is situated on the alluvial fan east of Pat Keyes Canyon. This site is approximately 0.7 miles northeast of, and downslope from, Badwater Springs. Running water was observed at the spring. The proposed facility would not impact the existing springs, nor any drainage features located in the area. The site is located outside of any drainage or potential inundation area. No springs or wetland areas are located within this alternative site's boundaries or in the immediate area.	This alternative site is north of Central Saline on an alluvial fan near the east-facing toe of the Nelson Range. The proposed improvements would be located on pylons and foundations elevated above the ground to provide adequate drainage.	No impacts are anticipated.
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Water and Hydrology Mitigation Measures (Alternatives A through E)		
Grading on all sites would be designed to avoid disruption of adjacent drainage. The gravel spread over the site would raise the level of the site approximately 6 to 12 inches.	Grading on all sites would be designed to direct water around the site and minimize the disruption of adjacent drainage.	No mitigatable impacts were identified.

Table 4-4. Short-Term Construction Related Emissions	
Criteria Pollutant	Total Emissions (tons/year)
Nitrogen Oxide	1.0008
Volatile Organic Chemicals	0.2028
PM10 Emissions	0.4719

Note: Construction efforts are expected to extend for 3 months.

Table 4-5. Long-Term Operational Air Quality Impacts Using Standby Power		
Criteria Pollutant	Factor (pounds/hour)	Emissions (pounds/year)[1]
Nitrogen Oxide	0.017	2.04
Volatile Organic Chemicals	0.052	6.24
PM10	0.001	0.12

[1] Assumes 120 hours of operation per year.

Under the Federal CAA, the proposed action is within an area regulated by the GBUAPCD classified as a serious nonattainment area for particulate matter less than or equal to PM10. As such, the *de minimis* level set for PM10 emissions is up to 70 tons per year per action. It has been determined (using the AFFTC CAA analysis program) that the relevant air emissions for this action are approximately 0.5 ton of PM10. The worst-case direct and indirect emissions from the Saline Valley Radar Facility project, when totaled, are less than the de minimis amounts specified in 40 CFR 51.853/93.153 (b)(1); therefore, a conformity determination is not required.

Potential air quality impacts associated with the alternatives are outlined in Table 4-6. The issues, relative to air quality analyzed, include the following:

- Short-term air quality impacts associated with site preparation and construction activities;
- Long-term air quality impacts associated with the facility's operations;
- The project's conformity to the applicable air quality management plan; and,
- The project's Federal facility conformity requirement.

4.5 Biological Resources Impacts of the Proposed Project

The assessment of impacts on biological resources associated with the implementation of a proposed action uses a sensitivity rating developed by Federal resource agencies. Plant communities with the highest sensitivity include those protected by Federal law. The most represented plant community located in the vicinity of the beacon radar sites is the creosote bush scrub. Creosote bush scrub is recognized as the preferred habitat for the Federally listed desert tortoise. The Saline Valley is not in the known historic range of the desert tortoise. Site surveys of the beacon radar alternatives and the microwave repeater sites were undertaken to ascertain the presence or absence of listed species, and none were found (Appendix B). Because of the small extent and location of the proposed sites, no impacts to wild horses, burrows, or big-horn sheep are expected.

The proposed beacon radar facilities would occupy sites consisting of approximately 35,000 square feet of land area, surrounded by a 10-foot wide cleared area, and an additional 16,000 square feet for construction staging activities. The construction staging area would be allowed to naturally re-vegetate according to discussions with the BLM and NPS. The potential disturbed area for the proposed microwave repeater sites would be limited to approximately 200 square feet. Table 4-7 summarizes the potential impacts of the alternatives on biological resources. The analysis considers the following issues:

- The project's potential for impacting plant and animal life or habitats within the affected area;
- The project's potential for impacting threatened and endangered species; and
- The proposed action's conformity with resource plans.

Table 4-6. Air Quality Impacts		
Short-Term (Construction) Emissions Impacts	**Long-Term Emissions Impacts**	**Air Conformity**
Alternatives A through E		
The proposed project would result in short-term emissions related to site preparation (grading, excavation, and construction), equipment emissions, and emissions associated with workers traveling to and from the construction site. The level of impact associated with all five beacon radar sites is comparable. The major impact is related to fugitive dust (PM10) emissions (Table 4-4).	One source of long-term emissions includes the infrequent use of the propane-powered back-up generators. Another source would include limited mobile emissions from vehicles and the dust associated with traveling on unimproved routes. These visits would occur between 6 and 12 times per year.	This project alternative does not exceed the conformity criteria established by the Clean Air Act. The proposed project would be in conformity with the State Implementation Plan (SIP).
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Air Quality Mitigation Measures (A through E)		
Short-Term (Construction) Emissions Impacts	**Long-Term Emissions Impacts**	**Air Conformity**
Contractors would be required to adhere to the protocols of the local air pollution control district (the Great Basins Valley Air Pollution Control District) regarding construction equipment emissions and the control of fugitive dust, including PM10. The aggregate used in the site's development must be taken from sources located within the Saline Valley as a means to reduce fugitive dust emissions.	The proposed power-generating equipment (used for back-up power) would be required to employ the applicable best available control technology (BACT) related to the installation and use of the back-up generator. Based upon the propane generator size, a Great Basin Unified Air Pollution Control District permit is not required.	Not applicable.

Table 4-7. Biological Resources Impacts		
Biotic Impacts	**Impacts on Threatened and Endangered Species**	**Conformity With Resource Plans**
Alternative A (Central Saline Beacon Radar Alternative)		
This site is located on the edge of the dry lake, just outside the zone of *Allenrolfea* and *Pluchea,* both of which are wetland indicators. Onsite vegetation is an alkaline-adapted all-scale species. Nearby, but not affected by the proposed facility, is a mesquite woodland and small area of standing water and aquatic vegetation associated with a man-made artesian well. Several large specimens of western cottonwood occur in the immediate vicinity of the well. Portions of the staging area would be located within an existing unimproved route that has undergone disturbance. The proposed facility may provide roosting and nesting sites for migratory bird species above those provided by the adjacent mesquite woodlands and cottonwoods. Nesting activities may impact radar operations. Problem nests may require removal.	This site has undergone previous disturbance and is located immediately south of an area containing a man-made artesian well. The site and the construction staging area would not encroach into this potentially sensitive area. No impacts are anticipated. There were no threatened or endangered species found at this site.	No encroachment into this wilderness and the protected habitats contained within would result from this alternative. Tops of cottonwood trees extending into the radar signal may have to be trimmed and will not impact the view from the Saline Valley Road due to their location. This would be accomplished in compliance with Wilderness Act provisions.
Alternative B (McElvoy Canyon Beacon Radar Alternative)		
This site and the proposed access route are relatively undisturbed. Vegetation is creosote bush scrub. Because there is no existing route from Saline Valley Road, a 500-foot access route that follows the contour of the topography would be utilized for construction and maintenance activities. The proposed facility may provide additional roosting and nesting sites for migratory bird species. Nesting activities may impact radar operations. Problem nests may require removal.	No impacts are anticipated. There were no threatened or endangered species found at this site.	The affected area is not located within protected wilderness areas.

Table 4-7 (Continued). Biological Resources Impacts		
Biotic Impacts	**Impacts on Threatened and Endangered Species**	**Conformity With Resource Plans**
Alternative C (Grey Eagle Mine Beacon Radar Alternative)		
This alternative site is located near a route that serves as access to the nearby Grey Eagle Mine. The site is on a relatively undisturbed outwash alluvial fan with a braided stream channel system on the periphery. The site has a well-developed cryptogrammic soil crust of lichens and cyanophytic algae. However, evidence of burro grazing appeared throughout the site. Portions of the staging area would be located within an existing unimproved route that has undergone disturbance. The proposed facility may provide additional roosting and nesting sites for migratory bird species. Nesting activities may impact radar operations. Problem nests may require removal.	No impacts are anticipated. There were no threatened or endangered species found at this site.	The affected area is not located within protected wilderness areas.
Alternative D (Keyes Canyon Beacon Radar Alternative)		
This site is heavily disturbed and the soils are compacted from long-term use as a vehicle turn-around area, with no actual plant growth onsite. Adjacent vegetation is creosote bush scrub. The proposed facility may provide roosting and nesting sites for migratory bird species above those provided by the nearby spring located west of the site. Nesting activities may impact radar operations. Problem nests may require removal. Because of the presence of the spring, burro activity was readily evident at this site. No biotic impacts would result from implementation of this alternative because of the nature of the site's disturbance.	No impacts are anticipated. There were no threatened or endangered species found at this site.	The affected area is not located within protected wilderness areas.

Table 4-7 (Concluded). Biological Resources Impacts		
Biotic Impacts	**Impacts on Threatened and Endangered Species**	**Conformity With Resource Plans**
Alternative E (Keyes Canyon North Beacon Radar Alternative)		
This site and the proposed access route are relatively undisturbed. Vegetation is creosote bush scrub. Because there is no existing route from Saline Valley Road, a 750-foot access route that follows the contour of the topography would be utilized for construction and maintenance activities. The proposed facility may provide roosting and nesting sites for migratory bird species above those provided by the nearby spring located south of the site. Nesting activities may impact radar operations. Problem nests may require removal.	No impacts are anticipated. There were no threatened or endangered species found at this site.	The affected area is not located within protected wilderness areas.
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Biological Resources Mitigation Measures (Alternatives A through E)		
Imported fill materials for the NPS sites would be approved by the Park Botanist for invasive species protection. Removal of active nests would only be accomplished with a depredation permit from the U. S. Fish and Wildlife Service. During construction, the Air Force will be responsible for obtaining a depredation permit, if needed. The FAA will be responsible for obtaining annual depredation permits for long-term maintenance of the facility. Passive, nonlethal preventive measures may be used to discourage nesting and roosting. To the maximum extent possible, existing access routes and disturbed areas will be used for equipment staging.	No mitigatable impacts were identified.	No mitigatable impacts were identified.

4.6 Noise Impacts of the Proposed Project

Potential noise impacts are identical for all alternatives, therefore, a generic table has been developed, Table 4-8. The issues analyzed include the following:

- The proposed project's potential for creating short-term (construction-related) noise impacts;
- The project's potential for generating long-term construction noise impacts associated with the facility's operation; and
- The proposed project's potential for impacting sensitive receptors.

4.7 Cultural Resources Impacts of the Proposed Project

The five beacon radar alternatives would involve limited grading and excavation. Two of the five beacon radar site alternatives exhibited considerable disturbance associated with the routes and other activities in the immediate area. One of the microwave repeater sites has also undergone considerable disturbance. No archaeological or historic resources have been identified within the potentially affected areas. American Indian consultations have been initiated and no issues have been raised (Appendix E).

Field surveys were conducted of the access routes and the development sites to assess the impacts on cultural resources. The survey included approximately a 3-acre plot around each location and a strip along each access route (Appendix B).

Table 4-9 summarizes potential impacts associated with the proposed beacon radar alternatives. The analysis considered the following issues:

- Potential impacts upon archaeological resources;
- Potential impacts upon historic resources; and
- Potential impacts upon American Indian values.

4.8 Traffic Impacts of the Proposed Project

Environmental effects of construction and maintenance traffic on the individual alternatives are discussed in this section. Access was a primary consideration in the identification of potential candidate sites for the beacon radar alternatives. All of the beacon radar alternatives are located near the Saline Valley Road or an unimproved route.

The distance to the sites located in the Saline Valley is nearly identical (approximately 2 hours of travel time each way) from the nearest construction support center (Bishop, California). Because the sites have identical development requirements, the actual trip generation for the five beacon radar alternatives would be the same. Construction-related travel is associated with the transport of equipment, modular buildings, and workers. Once operational, trips to the facility would be limited to routine maintenance and refueling of the propane fuel storage tank. Preliminary discussion with local contractors indicated that once construction starts, they would maintain a presence on site until their phase of construction is completed.

They indicated that no more than one round-trip per day would be made out of the Saline Valley for parts and supplies. Long-term maintenance and refueling activities would average approximately one to two trips per month.

Inyo County maintains the Saline Valley Road. Access would generally be available year-round, though temporary closures following snowstorms and washouts may occur. There are no expected operational constraints caused from access limitations. Table 4-10 summarizes the impacts of the various alternatives based on:

- Impact related to site access;
- Short-term traffic impacts; and
- Long-term traffic impacts.

Table 4-11 presents a summary comparison of the six alternatives, using eight attributes analyzed in the EA.

Table 4-8. Noise Impacts		
Short-Term (Construction-Related) Noise Impacts	**Long-Term Noise Impacts**	**Impacts on Sensitive Receptors**
Alternative A through E		
Sources of noise would be largely associated with construction equipment used during site preparation and modular building erection. Equipment use would be limited to approximately 3 months and relatively small-scale in nature. Heavy equipment (e.g., wheeled graders) may generate noise levels up to 90 to 110 decibels (dBA) 50 feet from the source.	Operational noise would include both mobile and stationary sources. Mobile noise sources would be limited to occasional visits to the facility by maintenance personnel, and propane fuel deliveries. Vehicles associated with these activities would consist of common commercial and personal types of vehicles, and would not involve any significant levels of noise. Operational stationary noise is related to the occasional use of the propane-powered generator used for emergency back-up power, and building air conditioning units. The generator and air conditioning units' noise levels would be less than 45 dBA at 50 feet from the noise sources.	There are no sensitive noise receptors within 0.5 mile of any of the sites.
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Noise Mitigation Measures (Alternatives A through E)		
No mitigation is planned for construction-related noise impacts.	The generator would be enclosed, thus reducing the effects of potential noise.	No mitigatable impacts were identified.

Table 4-9. Cultural Resources Impacts		
Impacts on Archaeological Resources	**Impacts on Historic Resources**	**Impacts on American Indian Values**
Alternative A (Central Saline Beacon Radar Alternative)		
According to archival research, no archaeological sites are recorded within the property or in the adjacent areas. No surface artifacts were found either on the site or along the access route during field surveys conducted by National Park Service (NPS) and U.S. Air Force contract archaeologists.	This site is located adjacent to two unimproved routes. Fences and a cattle guard (to protect the nearby man-made artesian well from the feral burro population) are found nearby. The proposed project site does not contain any existing historic structures.	No adverse impacts on American Indian values have been identified.
Alternative B (McElvoy Canyon Radar Beacon Alternative)		
According to archival research, no archaeological sites are recorded within the property or less than 0.25 mile from the project location. No surface artifacts were found during the field survey conducted by a U.S. Air Force contract archaeologist.	No historic resources were identified during the records search or field survey.	No adverse impacts on American Indian values have been identified.
Alternative C (Grey Eagle Mine Beacon Radar Alternative)		
According to archival research, no archaeological sites are recorded within the property or in the adjacent areas. No surface artifacts were found during a field survey conducted by a U.S. Air Force contract archaeologist.	The proposed project site is located within a largely undeveloped area containing no existing structures. No man-made features, other than the access route, are located in the Area of Potential Effect (APE). The site is relatively undisturbed.	No adverse impacts on American Indian values have been identified.
Alternative D (Keyes Canyon Beacon Radar Alternative)		
According to archival research, no archaeological sites are recorded within the property or in the adjacent areas. The site has been disturbed from utilization of the existing unimproved access route. No surface artifacts were found during a field survey conducted by a U.S. Air Force contract archaeologist.	A survey was undertaken to assess the site's significance. The site included remnants of relatively modern shelter structures and was littered with refuse.	No adverse impacts on American Indian values have been identified.

Table 4-9 (Concluded). Cultural Resources Impacts		
Impacts on Archaeological Resources	**Impacts on Historic Resources**	**Impacts on American Indian Values**
Alternative E (Keyes Canyon North Beacon Radar Alternatives)		
According to archival research, no archaeological sites are recorded within the property or in the vicinity. No surface artifacts were found during the field survey conducted by a U.S. Air Force contract archaeologist.	No historic resources were identified during the records search or field survey.	No adverse impacts on American Indian values have been identified.
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Cultural Resources Mitigation Measures (Alternatives A through E)		
If archaeological artifacts are discovered in the APE during the course of excavation and grading, these activities will be halted and a qualified agency archaeologist will be consulted to determine the appropriate action.	If historic artifacts are discovered during the course of excavation and grading, activities will be halted and a qualified agency expert will be consulted to determine the appropriate action.	A Timbisha Shoshone archaeological monitor will be notified and invited to be present during all construction activities on Timbisha Homeland areas.

Table 4-10. Traffic Impacts		
Impacts Related to Site Access	**Short-Term Traffic Impacts**	**Long-Term Traffic Impacts**
Alternatives A through E		
Development of a radar site anywhere in the Saline Valley will result in near identical impacts. Maintenance site visits and material deliveries are identical. All traffic would use the Saline Valley Road and an unimproved route to access the site. There are no planned improvements to the Saline Valley Road required for the project. Access to each alternative would be over an unimproved route. Portions of the route would require minimal development to accommodate trucks and other construction-related equipment.	Construction equipment (i.e., graders, front-end loaders), concrete delivery trucks, and personnel vehicles for construction crews would be required for each alternative. Because of the minimal number of vehicles and trips needed for construction-related activities, no traffic conflicts are anticipated.	The proposed project would involve minimal additional long-term traffic into the Saline Valley associated with periodic maintenance. Propane fuel required for the back-up generators would be delivered approximately once every 6 months. There are minimal maintenance requirements because of the beacon radar technology and the facility would supply its own source of power using solar technology. Potable water would be transported to the site and portable toilets would be installed.
Alternative F (No Action Alternative)		
No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.	No impacts would result. The status quo would be maintained.
Traffic Mitigation Measures (Alternatives A through E)		
Existing routes will be used to the maximum extent. New required access routes will follow the topography with minimal developments (i.e., filling in ruts, moving large rocks or other obstructing debris).	No mitigatable impacts were identified.	No septic tank systems would be used. No utility extensions would be required to provide service.

Table 4-11. Comparison of Alternatives						
Environmental Impacts	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**	**Alternative F**
Land Use	Moderate	None	None	None	None	None
Visual/Recreational Resources	Minor	Moderate	Minor	Moderate	Moderate	None
Geology and Soils	Minimal	Minimal	Minimal	Minimal	Minimal	None
Water and Hydrology	None	None	None	None	None	None
Air Quality	Minimal	Minimal	Minimal	Minimal	Minimal	None
Biological Resources	Moderate	Minor	Minor	Minimal	Minor	None
Noise	Minimal	Minimal	Minimal	Minimal	Minimal	None
Cultural Resources	None	None	None	None	None	None
Traffic	Minimal	Minimal	Minimal	Minimal	Minimal	None

Note: Rating scale is used within the attribute table only. Rating scale for Alternatives A through F is based upon the following system.

Minimal	Impacts that are not expected to be measurable or that are measurable but are too small to cause any change in the environment.
Minor	Potentially adverse impacts that are measurable, but are within the capacity of the impacted system to absorb the change or the impacts can be easily mitigated with little effort and resources so that they are not significant as defined by 40 CFR 1500–1508.
Moderate	Potentially adverse impacts that are measurable, but do not violate any laws or regulations and are within the capacity of the impacted system to absorb the change or the impacts can be mitigated with effort and resources so that they are not significant as defined by 40 CFR 1500–1508.
Major	Potentially adverse impacts that individually or cumulatively could be significant as defined by 40 CFR 1500–1508.
None	No impacts expected.

4.9 Microwave Repeater Impacts

The Galena Ridge Repeater Site antenna tower would be located on nonwilderness land near a cherry-stemmed mining road leading to the Santa Rosa Mine. The repeater site is at the end of a rough, four-wheel-drive access road, and the 20- to 40-foot tower would not be visible from Saline Valley. Development at this site would have a minor impact on visual resources because of its distance from Saline Valley and any other key observation points and because the site is located in a heavily disturbed mining area. Visual resource impacts would be reduced through design that incorporates colors compatible with the desert environment. Minor site development work would be required for the construction of the tower. The proposed site would require minimal vegetation removal. The access road will not require improvements. Long-term semiannual maintenance for the repeater would be required.

The Lead Canyon North Repeater Site antenna tower would be located on nonwilderness land within 50 feet of the centerline of the Saline Valley Road. No access route is required to the repeater site. The 20- to 40-foot tower would be visible from the Saline Valley Road. Minor site development work would be required for the construction of the tower. No improvements to the Saline Valley Road would be required. The proposed site is located in a relatively undisturbed area and would require minimal vegetation removal. Long-term semiannual maintenance for the repeater would be required.

The Lead Canyon South Repeater Site antenna tower would be located on nonwilderness land within 50 feet of the centerline of the Saline Valley Road. No access route is required to the repeater site. The 20- to 40-foot tower would be visible from the Saline Valley Road. Minor site development work would be required for the construction of the tower. No improvements to the Saline Valley Road would be required. The proposed site is located in a relatively undisturbed area and would require minimal vegetation removal. Long-term semiannual maintenance for the repeater would be required.

Table 4-12 presents a summary comparison of the three repeater site alternatives.

Table 4-12 Summary Comparison of the Three Repeater Sites[1]			
Environmental Impacts	**Galena Ridge Repeater Site (NPS)[2,3]**	**Lead Canyon South Repeater Site (NPS)**	**Lead Canyon North Repeater Site (NPS)[2]**
Land Use	Minimal	Moderate	Moderate
Visual/Recreational Resources	Minor	Moderate	Moderate
Geology and Soils	Minimal	Minimal	Minimal
Water and Hydrology	None	None	None
Air Quality	None	None	None
Biological Resources	Minimal	Minimal	Minimal
Noise	None	None	None
Cultural Resources	None	None	None
Traffic	Minimal	Minimal	Minimal

[1]For all repeater sites considered, visual and recreational resource impacts would be reduced through design that incorporates colors compatible with the desert environment.
[2]Based on comments from the public and agency review, the NPS sites would not be selected unless there is no reasonable and feasible alternative.
[3]The Galena Ridge site has been identified for possible inclusion into the Timbisha Shoshone Homeland.

Note: Rating scale is used within the attribute table only. Rating scale for the three repeater sites is based upon the following system.

Minimal	Impacts that are not expected to be measurable or that are measurable but are too small to cause any change in the environment.
Minor	Potentially adverse impacts that are measurable, but are within the capacity of the impacted system to absorb the change or the impacts can be easily mitigated with little effort and resources so that they are not significant as defined by CEQ[3].
Moderate	Potentially adverse impacts that are measurable, but do not violate any laws or regulations and are within the capacity of the impacted system to absorb the change or the impacts can be mitigated with effort and resources so that they are not significant as defined by 40 CFR 1500–1508.
Major	Potentially adverse impacts that individually or cumulatively could be significant as defined by 40 CFR 1500–1508.
None	No impacts expected.

5.0 CUMULATIVE IMPACTS

5.1 Introduction to Cumulative Impacts

Although the impacts of an individual project may be insignificant, the purpose of this assessment is to consider whether a proposed action, if carried out simultaneously with other approved or proposed projects in the immediate area, would have an adverse cumulative effect. In general, effects of a particular action or group of actions typically meet all of the following criteria to be considered a cumulative impact. The potential effects of an action or project typically:

- Occur in a similar locale or region;
- Are not localized (i.e., can contribute to effects of an action in a different location);
- Have a measurable impact on a particular resource; and
- Are long-term in nature (short-term construction impacts would dissipate over time and cease to contribute to cumulative impacts).

Section 5.2 outlines the proposed actions within the proposed project area that may represent a cumulative impact.

5.2 Cumulative Projects

The FAA and DOD have plans to upgrade the existing six R-2508 Airport Surveillance Radar (ASR)-8 with updated systems. This is an approved and funded project that is planned to occur over the next three to eight years. This project is independent of the Saline Valley project. The proposed project consists of a radar facility and a repeater site. Approximately one acre would be needed for both facilities. The facility is unmanned and no utilities are required.

China Lake NAWS is in the process of publishing a document, *Environmental Impact Statement for Proposed Military Operational Increases and Implementation of Associated Comprehensive Land Use and Integrated Natural Resources Management Plans.* The preferred alternative is the Moderate Expansion Alternative and proposes a 25% increase in type and tempo of some test and evaluation operations and training activities. The proposed changes in flight operations are focused on Armitage Airfield and the north and south weapons ranges in restricted areas R-2505 and R-2524 with flight activity in the Saline Valley remaining at historic levels. No cumulative impacts will result from the combination of these two proposed actions.

Government and commercial communications facilities that serve the region are sited on surrounding peaks. These types of facilities have a history of growth. No additional communication or radar facility projects for the Saline Valley have been identified.

5.3 Potential Cumulative Impacts

Based on the considerations outlined in this section, the proposed project would not be likely to result in significant cumulative impacts. While not required, implementation of the mitigation measures identified in this document, as well as adherence to the best management practices, would reduce any potential cumulative impacts. Key considerations related to the identification of cumulative effects include the following:

- The majority of the physical environmental impacts associated with the proposed project's implementation are not cumulative because they are short-term (construction-related). These short-term impacts include noise and air quality impacts from construction equipment and would cease once construction is completed. Long-term physical environmental impacts include those to visual and recreational resources. Best management practices will be applied in designing the facility to blend into the background to reduce visual and recreational resource impacts as much as feasible.
- The operational impacts related to noise, traffic, and air quality would be comparable to those that exist, since the proposed facility would be unmanned. Vehicle trips into the Saline Valley would be limited to infrequent maintenance activities.
- It is not anticipated that the proposed project would result in the take of any threatened or endangered species.

- Analysis determined that no cultural resources have been identified or found on any of the proposed sites. Nevertheless, best management practices would be used to mitigate any potential impacts to cultural resources encountered during construction.
- The proposed beacon radar facility would not impact low-income and/or minority populations. There are no permanent residences at or near any of the beacon radar and microwave repeater sites.
- Consultation with the Timbisha Shoshone Tribe is ongoing. The Timbisha Shoshone Tribe is a cooperating agency on the EA for this project. No issues have been identified.
- Plot size and solar design will not support additional systems of a substantial nature, thereby limiting future operational activities.

6.0 OTHER NEPA CONSIDERATIONS

6.1 Irreversible or Irretrievable Commitment of Resources

Resources that are irreversibly or irretrievably committed to a project or action include those that are typically used on a long-term or permanent basis. However, some resources used on a short-term basis that cannot be recovered are also considered to be irretrievable. Resources are also considered irretrievable when they are used for one project and thus become unavailable for other uses. An impact that falls under the category of the irreversible or irretrievable commitment of resources involves the destruction of natural resources that could limit the range of potential uses of that resource. Potential resources that would be irretrievably committed to the proposed project include the following:

- Implementation of the proposed project would involve the commitment of nonrenewable resources such as water, energy, sand and gravel, and metals. Use of these resources would represent a minimal increase in the regional consumption of these commodities.
- The proposed project would result in the installation of a beacon radar and associated microwave repeater that, combined, would occupy approximately 1.0 acre of land area. These facilities would represent a long-term commitment in terms of operation and maintenance that would continue over the life of the project. However, the facilities would be modular in nature and installed on pylons. As a result, they may be removed in the future and the land restored to a natural state.

6.2 Growth-Inducing Impacts

Growth-inducing impacts are generally associated with the provision of urban services (e.g., utilities, improved routes, and expanded public services) to an undeveloped or rural area. Rather, the proposed beacon radar facility is in response to safety concerns regarding the lack of available radar coverage within the Saline Valley portion of the R-2508 Complex. Any increase in DOD usage above historic levels would require additional NEPA analysis that would include an opportunity for public review and comment. The proposed project is not considered to be growth inducing based on the factors presented in Table 6-1.

6.3 Conclusions

Overall, no potentially significant issues have been identified at any of the five alternative beacon radar sites or any of the three repeater sites considered for the proposed project. A careful review of the environmental issues that have been brought forward to date has not identified any potentially significant issues. This EA concludes that the implementation of the proposed action will not have a significant impact on the existing natural or human environment.

6.3.1 Beacon Radar Alternatives

Alternative A (Central Saline)—No significant environmental issues were identified. Alternative A is located on NPS land and is immediately adjacent to designated NPS wilderness. Of the five alternatives considered, this alternative has the least impact on visual and recreational resources because it is largely shielded from key observation points by existing vegetation. In addition, it has reduced visibility because of its distance from key observation points along Saline Valley Road and the Warm Spring area. However, there are additional construction costs and difficulties associated with this site. Also, while this is the technically preferred alternative for radar (95%) and communication coverage, it would require a DOT 4(f) finding. This finding would require a determination that there are no other feasible and prudent alternatives. A 4(f) finding is required for this alternative because of its location on NPS land. A 4(f) finding is not in itself a significant issue. These types of findings are routinely done throughout the United States when required due to a lack of feasible and prudent options.

Alternative B (McElvoy Canyon)—No significant environmental issues were identified. Alternative B is located on BLM land and has been identified as the preferred alternative. This alternative has a moderate impact on visual and recreational resources because of its proximity to the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors and textures compatible with the desert environment. This site has the best radar (85%) and communication coverage of all the BLM alternatives.

Table 6-1. Potential Growth-Inducing Impacts		
Factors Contributing to Growth Inducement	**Project's Potential Contribution**	**Basis for Determination**
New development in an area presently undeveloped and economic factors that may influence development.	No potential for growth inducement in the vicinity of the project site.	The proposed unmanned beacon radar facility is not likely to increase commerce within Saline Valley.
Extension of roadways and other transportation facilities.	No potential for growth-inducing impacts anticipated.	Based on site visits, Saline Valley Road is adequate to support the construction project. No major road improvements are planned; minor improvements off Saline Valley Road may be needed to provide access.
Extension of infrastructure and other improvements.	No potential for growth-inducing impacts anticipated.	Utilities would not be required to accommodate the proposed beacon radar facility because it would be self-contained.
Major offsite public projects (e.g., treatment plants).	No potential for growth-inducing impacts anticipated.	The proposed unmanned, self-contained beacon radar facility does not require offsite project support.
Removal of housing requiring replacement of housing elsewhere.	No potential for growth-inducing impacts anticipated.	No housing is located in or near any of the alternative sites.
Additional population growth leading to increased demand for goods and services.	No potential growth-inducing impacts on the population would result.	The projected temporary (2 to 3 months) employment is not anticipated to increase the demand for goods and services in the area.
Short-term growth-inducing impacts related to the project's construction.	No potential for growth-inducing impacts anticipated.	Short-term construction employment is not anticipated to result in growth-inducing impacts.

Alternative C (Grey Eagle Mine)—No significant environmental issues were identified. Alternative C is located on BLM land. This alternative has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be further reduced through design that incorporates colors and textures compatible with the desert environment. This site has adequate radar (80%) and communication coverage.

Alternative D (Keyes Canyon)—No significant environmental issues were identified. Alternative D is located on BLM land. This alternative has a minor impact on visual and recreational resources because of its proximity to the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors and textures compatible with the desert environment. This site has adequate radar (80%) and communication coverage.

Alternative E (Keyes Canyon North)—No significant environmental issues were identified. Alternative E is located on BLM land. This alternative has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road, a key observation point. Visual and recreational resource impacts would be further reduced through design that incorporates colors and textures compatible with the desert environment. This site has adequate radar (80%) and communication coverage.

Alternative F (No Action Alternative)—Generally, for construction projects, the environmentally preferred alternative is no action. This typically means the alternative that causes the least damage to the biological and physical environment. However, this alternative has major negative impacts with respect to air traffic safety.

6.3.2 Microwave Repeater Site Options

Lead Canyon South—This site is on NPS land and is immediately adjacent to designated BLM wilderness. This is the preferred location for the microwave repeater. The repeater tower is expected to be from 20 to 40 feet in height, with a 6- by 6- by 6-foot triangular concrete pad. This site has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road (within 50 feet of the centerline), a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors compatible with the desert environment. This site has adequate communications with Keeler Peak. This site would require a DOT 4(f) finding.

Lead Canyon North—This site is on NPS land and is immediately adjacent to designated NPS wilderness. The repeater tower is expected to be from 20 to 40 feet in height, with a 6- by 6- by 6-foot triangular concrete pad. This site has a moderate impact on visual and recreational resources because of its distance from the Saline Valley Road (within 50 feet of the centerline), a key observation point. Visual and recreational resource impacts would be reduced through design that incorporates colors compatible with the desert environment. This site has adequate communications with Keeler Peak. The site would require a DOT 4(f) finding.

Galena Ridge—This site is on NPS land and is immediately adjacent to designated NPS wilderness. The repeater tower is expected to be from 20 to 40 feet in height, with a 6- by 6- by 6-foot triangular concrete pad. This site has a minor impact on visual and recreational resources because of its distance from Saline Valley and any other key observation points. Visual and recreational resource impacts would be reduced through design that incorporates colors compatible with the desert environment and placement (AFFTC 2003) (Appendix F). This site has the best communications with Keeler Peak. The site would require a DOT 4(f) finding.

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