



Department
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*Draft Final Environmental
Assessment*

Construction, Operation, and Maintenance of the RV Park Expansion

Fort Irwin, CA

Notice: Reviewers should provide the Department of the Army (DA) with their comments during the review period of the Environmental Assessment (EA). This will enable the DA to analyze and respond to the comments at one time and to use information acquired in the preparation of the EA, thus avoiding undue delay in the decision-making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions (*Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553, 1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the Final Environmental Impact Statement (*City of Angoon v. Hodel*, 9th Cir, 1986; and *Wisconsin Heritages Inc., v. Harris*, 490F. Supp. 1334, 1338, E.D. Wis. 1980). Comments on the EA should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (*40 Code of Federal Regulations* [CFR] 1503.3).

Comments received in response to this document, including names and addresses of those who comment, will be considered part of the public record on this Proposed Action and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit anonymous comments will not have standing to appeal the subsequent decision under 36 CFR Parts 215 or 217. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The DA will inform the requester of the agency's decision regarding the request for confidentiality, and where the request is denied the agency will return the submission and notify the requester that the comments may be resubmitted, with or without name and address.

Additional documentation, reports, and analysis referenced in this document can be found in the administrative record files. These items have not been included in this document due to technical nature, excessive length, or are reference materials used to develop the analysis in this document. All supporting documents in the planning record are located at the Environmental Management Division, Department of Public Works, Fort Irwin, California.

SIGNATURE PAGE

ENVIRONMENTAL ASSESSMENT

Construction, Operation, and Maintenance of the Fort Irwin RV Park Expansion

Proponent: U.S. Army Garrison, Fort Irwin, California

NEPA Lead Agency: U.S. Army Garrison, Fort Irwin, California

APPROVAL

This Environmental Assessment meets the requirements of NEPA, 40 CFR 1500-1508, Army Regulation 200-1, Environmental Protection and Enhancement, dated 13 December 2007 and 32 CFR 651(AR 200-2) Environmental Analysis of Army Actions, dated 29 March 2002.

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Contents

Acronyms and Abbreviations	ix
Executive Summary	ES-1
ES-1 Introduction	ES-1
ES-2 Purpose and Need of the Proposed Action	ES-1
ES-3 Proposed Action and Alternatives	ES-1
ES-3.1 Proposed Action.....	ES-1
ES-3.2 No Action Alternative	ES-2
ES-4 Summary of Impacts	ES-2
ES-4.1 Direct Impacts.....	ES-2
ES-4.2 Cumulative Impacts	ES-4
ES-5 Summary of Project Design Measures.....	ES-4
1 Purpose and Need	1-1
1.1 Introduction	1-1
1.2 Purpose and Need for the Proposed Action	1-1
1.2.1 Project Objectives	1-3
1.3 Scope of Analysis	1-3
1.3.1 Resource Areas Eliminated from Analysis	1-3
1.3.2 Resource Areas Analyzed.....	1-4
1.4 Framework for Decision Making	1-4
1.5 Permits, Approvals, and Agreements Required by Other Agencies	1-5
1.6 Relevant Statutes, Regulations, and Executive Orders.....	1-7
1.7 Agency and Public Participation	1-9
2 Description of Proposed Action and Alternatives	2-1
2.1 Proposed Action.....	2-1
2.2 No Action Alternative	2-1
2.3 Alternatives Considered but Not Carried Forward	2-2
3 Affected Environment	3-1
3.1 Soils	3-1
3.2 Biological Resources	3-1
3.2.1 Regulatory Considerations.....	3-2
3.2.2 Biological Resources Survey.....	3-2
3.2.3 Flora	3-2
3.2.4 Fauna	3-4
3.3 Water Resources.....	3-11
3.3.1 Surface Water	3-11
3.3.2 Groundwater.....	3-12
3.4 Air Quality	3-12
3.4.1 Regulatory Setting	3-12
3.4.2 Existing Conditions.....	3-15
3.4.3 Climate Change and Greenhouse Gases.....	3-16
3.5 Cultural Resources	3-17
3.5.1 Regulatory Considerations.....	3-17
3.5.2 Project Area Conditions	3-18
3.6 Noise	3-19
3.6.1 Regional Noise Environment	3-19

3.6.2	Local Environment	3-19
3.6.3	Sensitive Receptors.....	3-19
3.6.4	Noise Policies	3-19
3.7	Utilities.....	3-20
3.7.1	Water Treatment and Distribution	3-21
3.7.2	Wastewater.....	3-21
3.7.3	Stormwater	3-21
3.7.4	Energy	3-21
3.7.5	Solid Waste Management.....	3-22
3.8	Hazardous Materials	3-22
3.9	Health and Safety.....	3-22
3.10	Aesthetics.....	3-23
3.11	Transportation	3-23
3.11.1	Local Transportation Roads and Conditions	3-23
3.11.2	Regional Roads and Conditions	3-23
3.11.3	Traffic Flow and Safety at Fort Irwin and the Cantonment Area.....	3-24
3.11.4	Aircraft Facilities	3-24
3.12	Recreation.....	3-24
4	Environmental Consequences	4-1
4.1	Soils	4-1
4.1.1	Proposed Action.....	4-1
4.1.2	No Action Alternative	4-2
4.1.3	Cumulative Impacts	4-2
4.1.4	Project Design Measures	4-2
4.2	Biological Resources	4-2
4.2.1	Proposed Action.....	4-3
4.2.2	No Action Alternative	4-6
4.2.3	Cumulative Impacts	4-6
4.2.4	Project Design Measures	4-6
4.3	Water Resources.....	4-8
4.3.1	Proposed Action.....	4-8
4.3.2	No Action Alternative	4-9
4.3.3	Cumulative Impacts	4-9
4.3.4	Project Design Measures	4-9
4.4	Air Quality	4-10
4.4.1	Significance Criteria	4-10
4.4.2	Proposed Action.....	4-10
4.4.3	No Action Alternative	4-11
4.4.4	Cumulative Impact.....	4-12
4.4.5	Project Design Measures	4-12
4.4.6	Climate Change and Greenhouse Gases.....	4-12
4.5	Cultural Resources	4-12
4.5.1	Proposed Action.....	4-12
4.5.2	No Action Alternative	4-13
4.5.3	Cumulative Impacts	4-13
4.6	Noise	4-13
4.6.1	Proposed Action.....	4-13
4.6.2	No Action Alternative	4-15
4.6.3	Cumulative Impacts	4-15
4.6.4	Project Design Measures	4-15

4.7	Utilities	4-15
4.7.1	Proposed Action.....	4-15
4.7.2	No Action Alternative	4-17
4.7.3	Cumulative Impacts	4-17
4.8	Hazardous Materials	4-18
4.8.1	Proposed Action.....	4-18
4.8.2	No Action Alternative	4-18
4.8.3	Cumulative Impacts	4-18
4.8.4	Project Design Measures	4-18
4.9	Health and Human Safety	4-19
4.9.1	Proposed Action.....	4-19
4.9.2	No Action Alternative	4-19
4.9.3	Cumulative Impacts	4-19
4.9.4	Project Design Measures	4-19
4.10	Aesthetics.....	4-20
4.10.1	Proposed Action.....	4-20
4.10.2	No Action Alternative	4-20
4.10.3	Cumulative Impacts	4-20
4.11	Transportation	4-20
4.11.1	Proposed Action.....	4-21
4.11.2	No Action Alternative	4-21
4.11.3	Cumulative Impacts	4-21
4.11.4	Project Design Measures	4-21
4.12	Recreation.....	4-22
4.12.1	Proposed Action.....	4-22
4.12.2	No Action Alternative	4-22
4.12.3	Cumulative Impacts	4-22
4.13	Summary of Impacts and Project Design Measures	4-22
5	List of Preparers	5-1
6	References.....	6-1
7	Distribution List	7-1

Appendices

A	Correspondence
B	Natural Resources Survey Report
C	Cultural Resources Inventory Report
D	Record of Non-applicability and Air Quality Emissions Calculations

Tables

ES-1	Summary of Impacts	ES-2
ES-2	Summary of Project Design Measures.....	ES-5
1-1	Permits and Approvals.....	1-5
3-1	Special-status Species that May Occur in the Project Vicinity.....	3-10
3-2	Ambient Air Quality Standards	3-13
3-3	Noise Compatibility Zones	3-20
4-1	Proposed Action Construction Emissions	4-11
4-2	Noise Levels of Construction Equipment at 50 and 100 Feet.....	4-14

4-3 Summary of Project Design Measures..... 4-22
5-1 List of Preparers 5-1

Figures

1-1 Vicinity Map 1-2
2-1 Project Area 2-3

Acronyms and Abbreviations

°F	degrees Fahrenheit
ADNL	A-weighted day-night level
AB 32	Global Warming Solutions Act of 2006
APE	area of potential effect
AR	Army Regulation
ARB	[California] Air Resources Board
Army	U.S. Army
BLM	Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emission Estimator Model
CDFW	California Department of Fish and Wildlife
CDMG	California Division of Mines and Geology
CDNL	C-weighted day-night level
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	<i>Code of Federal Regulations</i>
CH ₄	methane
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CWA	Clean Water Act
DAR	defense access road
dB	decibel
dBA	decibel (A-weighted scale)
dBC	decibel (C-weighted scale)
DDW	[California] Division of Drinking Water
DTSC	[California] Department of Toxic Substances Control
EA	Environmental Assessment

EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FNSI	Finding of No Significant Impact
Fort Irwin	U.S. Army National Training Center at Fort Irwin
FY	fiscal year
GHG	greenhouse gas
GIS	geographic information system
gpd	gallons per day
HFC	hydrofluorocarbon
I-15	Interstate 15
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
kV	kilovolt
LEED	Leadership in Energy and Environmental Design
LRWQCB	Lahontan Regional Water Quality Control Board
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District
MDPA	Mojave Desert Planning Area
MEC	munitions or explosives of concern
mgd	million gallons per day
mph	miles per hour
mWh	megawatts per hour
MWR	Morale, Welfare, and Recreation
N_2O	nitrous oxide
NA	not applicable
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NAWS	Naval Air Weapons Station
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxide

NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O ₃	ozone
O&M	operation and maintenance
PFC	perfluorocarbon
PM ₁₀	particulate matter less than 10 microns in aerodynamic diameter
PM _{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
ppm	parts per million, by volume
RONA	Record of Non-applicability
RV	recreational vehicle
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SO _x	sulfur oxide
SSC	[California] Species of Special Concern
SWPPP	Stormwater Pollution Prevention Plan
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
UXO	unexploded ordnance
VOC	volatile organic compound
WWTP	wastewater treatment plant

Executive Summary

ES-1 Introduction

The Recreational Vehicle (RV) Park at Fort Irwin serves soldiers and civilian contractors associated with training rotations, retired military patrons, permanent change of station personnel, temporary duty personnel, temporary additional duty personnel, and families of those residing at Fort Irwin. In addition to soldiers and civilians residing at Fort Irwin, training rotation support is provided by 75 contractor firms that provide a variety of services. There is a high utilization rate of the RV Park by civilian contractors during these periods, who often stay at the RV Park for extended time periods of longer than one month.

The current capacity for camp sites, services, and resources is less than adequate. The RV Park provides 50 RV sites, each with 30-amp electrical service. Water is provided to each site; however, there is no at-site wastewater service provided. The wastewater service is provided through two means, either pumping via truck service several times per month or use of a nearby vault latrine dump point. Long-term stays and overcrowding are also challenges that the RV Park faces. RV sites often contain two RVs parked in one site with equipment to splice the electrical service for two units. In addition, the RV Park operates an informal overflow lot located at one end of the site. The overflow lot does not provide electrical or water service and is used as a parking area and for guests awaiting a formal site assignment. The overflow lot often has several occupants. Fort Irwin proposes to expand, renovate, and modernize the existing RV Park.

ES-2 Purpose and Need of the Proposed Action

The Proposed Action is to expand, renovate, and modernize the existing RV Park to meet the growing demand of soldiers and contractors associated with training rotations, retired military patrons, and their families. The current capacity for camp sites, services, and resources is less than adequate.

ES-3 Proposed Action and Alternatives

Alternatives were screened based on the following evaluation criteria:

- Effects on environmental resources
- Feasibility
- Construction and life-cycle costs (capital plus operation and maintenance [O&M] costs)

From this process, two alternatives were selected for detailed and equal analysis: the Proposed Action and the No Action Alternative. One additional alternative was considered but was eliminated as it did not provide additional cost benefits.

ES-3.1 Proposed Action

The Proposed Action consists of constructing the following components:

- Existing 50 RV sites would be provided with concrete parking pads and a 200-square-foot area of pavers to the right of the concrete pad that would be used for outdoor living or to park a towed vehicle.
- Fifty-nine (59) additional RV parking sites would be constructed and would include concrete parking pads, utility connections, a combination fire ring/grill, and individual picnic tables.
- Allowances would be made for an underground utility connection to utility primaries designed to accommodate peak season as follows: potable water including fire water distribution (500 linear

feet), a sanitary sewer line (5,000 linear feet), electrical line (3,000 linear feet) with appropriate transformers, and fiber optic (2,000 linear feet) communications line.

- Improvements would be made to the expansion area to include enclosed dumpsters, xeriscaping, chain-link fencing, and construction of a comfort station with showers, restrooms, a game room, kitchen/dining room, meeting room, and maintenance storage.
- A propane filling station would be installed.
- An RV Park registration booth would be installed.

ES-3.2 No Action Alternative

Under the No Action Alternative, the proposed RV Park expansion would not be implemented and current conditions would continue into the future. There would be no impacts from construction and operation of the expanded RV Park. Under the No Action Alternative, continuation of current conditions would not meet the demand for capacity of RV spaces for soldiers, retirees, and their families. Increased revenue that would result from an expanded RV Park, which would help support the entire Morale, Welfare, and Recreation (MWR) program, would not result. Furthermore, existing patrons would continue to receive less than adequate services than are expected at facilities of this nature. The No Action Alternative is carried forward as a baseline for comparison with the Proposed Action.

ES-4 Summary of Impacts

ES-4.1 Direct Impacts

The effects on environmental and socioeconomic resources resulting from implementation of the Proposed Action and the No Action Alternative are summarized in Table ES-1.

TABLE ES-1
Summary of Impacts
RV Park Expansion Plan EA, Fort Irwin, California

Resource	Proposed Action Environmental Consequences	No Action Alternative Environmental Consequences
Land Use Planning		
Project Area	No effect.	No effect.
Surrounding Area	No effect.	No effect.
Geology, Soils, and Mineral Resources		
Geology and Mineral Resources	No effect.	No effect.
Soils	Short-term potential for soil erosion effects on disturbed soils during construction.	No effect.
Seismicity	No effect.	No effect.
Biological Resources		
Flora	Negligible effects from construction in degraded habitat. No effect once in operation.	No effect.
Fauna	Temporary, negligible effect to common wildlife during construction due to disturbances in degraded habitat. No effect once in operation.	No effect.
Special-status Species	Temporary, minor effects to desert tortoise during construction with mitigation measures implemented. Temporary, negligible effects to	No effect.

TABLE ES-1
Summary of Impacts
RV Park Expansion Plan EA, Fort Irwin, California

Resource	Proposed Action Environmental Consequences	No Action Alternative Environmental Consequences
	desert tortoise during maintenance activities with mitigation measures implemented.	
Water Resources		
Surface Water	Long-term negligible impacts from increase in impervious surface.	No effect.
Groundwater	Long-term negligible impact from increase in water usage.	No effect.
Air Quality		
	Potential for short-term fugitive dust emissions from soil disturbance during construction.	No effect.
	Short-term vehicle and equipment exhaust emissions during construction. No effects once in operation.	
Noise		
	Short-term minor impact due to increase in noise level from construction activities to users of existing RV Park. No effect once in operation.	No effect.
Cultural Resources		
	No effect.	No effect.
Socioeconomics		
	Short-term beneficial effects on regional economic activity from construction.	No effect.
	No Environmental Justice and Protection of Children effects.	
Recreation		
	Long-term beneficial effects.	Long-term adverse effect by not meeting RV Park capacity needs.
Health and Human Safety		
	No effect.	No effect.
Transportation		
	Negligible effects on traffic in the cantonment area during construction with use of traffic control plan. No effects once in operation.	No effect.
Utilities		
Water Distribution	No effect.	No effect.
Water Treatment	Long-term negligible effect from increase in water usage.	No effect.
Wastewater Treatment	Long-term negligible effect from increase in wastewater.	No effect.
Stormwater	Long-term negligible effect from increased impervious surface.	No effect.
Energy	Long-term negligible effect from increased energy consumption.	No effect.
Solid Waste		
	Negligible short-term effects from generation of construction waste.	No effect.

TABLE ES-1

Summary of Impacts*RV Park Expansion Plan EA, Fort Irwin, California*

Resource	Proposed Action Environmental Consequences	No Action Alternative Environmental Consequences
Aesthetics	Negligible long-term effect from change to view shed due to expanded RV Park.	No effect.
Hazardous and Toxic Substances	Use of small quantities of potentially hazardous materials (e.g., oils and grease) during construction. Waste would be characterized and disposed of in an appropriate manner.	No effect.

ES-4.2 Cumulative Impacts

Constructing new facilities, as well as modifying existing facilities and infrastructure, are ongoing at Fort Irwin. Recently completed projects include the construction of a new hospital and new water treatment plant (Irwin Water Works). Multiple other construction projects could occur on Fort Irwin simultaneously and could include wastewater and water infrastructure improvements, construction related to an Energy Savings Performance Contract at the Fort Irwin landfill, facilities to support the operation of a new Unmanned Aircraft Systems hangar and maintenance facility, a solar facility, and stormwater controls in the cantonment and the Tiefert City training area. Cumulative effects on soils, biological resources, traffic, and air quality from the Proposed Action could occur, but would be temporary and minimal with the use of project design measures. No long-term cumulative effects would result from the Proposed Action.

ES-5 Summary of Project Design Measures

Measures would be implemented to ensure that adverse environmental effects from construction and operation of the Proposed Action would be avoided or minimized. These measures would be incorporated into the final design, implemented by the construction contractor, and included in the contract documents. These measures are presented in Table ES-2.

TABLE ES-2
Summary of Project Design Measures
RV Park Expansion Plan EA, Fort Irwin, California

Resource	Potential Effect	Construction and O&M Design Measures
Geology, Soils, and Mineral Resources		
	Soil erosion	<p>Construction Phase: Employ BMPs for control of erosion and sediment. Prepare and implement SWPPP.</p>
Biological Resources		
	Desert tortoise (may affect, but not likely to adversely affect)	<p>Construction Phase: Before construction begins, personnel working on the site would be given a briefing on the desert tortoise, detailing its life history as well as the protocol to follow if a tortoise is encountered.</p> <p>Within two weeks of the onset of construction, 100 percent coverage ground surveys would be conducted of the project area for tortoises, signs of use, or burrows. If no tortoises or active burrows are identified, then construction would proceed without interruption.</p> <p>During land clearing and construction, a biological monitor would be available to observe construction activities and to verify that no tortoises wander into the construction area. If a tortoise is present, construction in the immediate vicinity would be halted while the tortoise is relocated out of the construction area.</p> <p>Desert tortoise exclusion fencing would be placed at staging and parking areas. Desert tortoise guards would be placed at entrances to the staging and parking areas. Fence installation would be overseen by an authorized biologist.</p> <p>Desert tortoise burrows located within 100 feet of the limits of construction would be marked and protected by conducting additional briefings on their locations to insure avoidance. Desert tortoise burrows that cannot be avoided would be excavated by hand either by an authorized biologist or under his/her direct supervision. Burrow excavation and subsequent handling of any desert tortoise would follow the most up-to-date guidelines that are acceptable to USFWS.</p> <p>Workers will be required to inspect the underside of all onsite parked vehicles before moving them (unless parked in a staging or parking area protected by exclusion fencing). If a desert tortoise is detected, then an authorized biologist will remove the animal to a safe place or wait until the animal moves to safety on its own.</p> <p>O&M Phase: Channels and basins would be designed so that desert tortoise can pass through these features unimpeded and so that desert tortoise would not be constrained in these features.</p> <p>Speed limits in and around the project area will be enforced throughout construction and maintenance activities. Vehicles shall not exceed 15 mph on unpaved roads and the right-of-way accessing the construction sites or 10 mph during the night.</p>

TABLE ES-2
Summary of Project Design Measures
RV Park Expansion Plan EA, Fort Irwin, California

Resource	Potential Effect	Construction and O&M Design Measures
	<p>Special-status species and avian species (potential disturbance)</p> <p>Pest species</p>	<p>Construction Phase: Land and vegetation clearing would occur outside the breeding season for birds of concern, defined as February 15 to August 31, where practicable.</p> <p>If vegetation clearing is required during the breeding season, then preconstruction surveys of breeding birds would be conducted. If active nests are identified, they would be protected from disturbance by a 500-foot nesting buffer, which would remain in place until the young have fledged from the nest, and no new nests would be initiated for the season.</p> <p>If a kit fox burrow is identified on or adjacent to the project area during the preconstruction survey, Fort Irwin natural resources staff will be contacted. Fort Irwin staff would determine the status of the burrow and establish an exclusion zone if necessary. Fort Irwin would decide if fencing or flagging would suffice to delineate the exclusion zone.</p> <p>Construction Phase: During construction, all trash and debris would be placed in receptacles for delivery to approved landfill facilities. Site cleanup of trash and debris would be required on a daily basis, including emptying and disposing of trash receptacles.</p> <p>O&M Phase: Proper waste management on the RV Park grounds would limit the potential for pest species to occur.</p>
Water Resources		
Surface Water	Soil erosion, runoff, and sedimentation impacts	<p>Construction Phase: Proper BMPs would be implemented before land grading begins. Natural vegetation would be preserved when possible. Erosion, runoff, and sediment control measures would be implemented in case of a stormwater event. Erosion control measures such as compost blankets, mulching, watering, riprap, seeding and sodding, geotextiles, and slope drains could be used to protect exposed soil and minimize erosion. BMPs such as check dams, slope diversions, and temporary diversion dikes could be implemented for runoff control. Sediment control measures that could be implemented include compost filter berms and socks; fiber rolls or berms; sediment basins, rock dams, filters, chambers, or traps; silt fences; storm drain inlet protection; and hay bales. Good housekeeping measures would be practiced during construction. Site-specific stormwater BMPs would be detailed in a construction SWPPP that would be prepared by the contracted construction company prior to breaking ground.</p> <p>O&M Phase: During operation of the Proposed Action, potential impacts on surface waters would be minimized by practicing good housekeeping at the facility to prevent any unwanted materials from being washed away during storm events. Examples of good housekeeping practices could include proper materials storage and keeping the site free of spills. Post-construction BMPs, consisting of detention ponds, would maintain pre-development runoff flows for 10-year floods and attenuate larger storm events.</p>

TABLE ES-2
Summary of Project Design Measures
RV Park Expansion Plan EA, Fort Irwin, California

Resource	Potential Effect	Construction and O&M Design Measures
Water Supply	Increase in water usage	<p>Construction Phase: Recycled water would be used for dust suppression during construction and maintenance activities instead of treated groundwater.</p> <p>O&M Phase: Use of xeriscaping is planned for the Proposed Action. Continuing current education and conservation programs could reduce water demand by as much as 5 percent.</p>
Air Quality	Fugitive dust impacts	<p>BMPs such as dust suppression techniques that could include spraying the ground with water would be implemented for construction and maintenance activities. Fort Irwin implements dust abatement programs that address problems associated with wind erosion and suspension of particles, including chemical stabilization and revegetation. Additionally, the requirements set forth in Rule 403.2, Fugitive Dust Control for the MDPA, would be adhered to, and would include implementation of a dust control plan.</p>
Noise	Noise impacts during construction	<p>Construction Phase: Construction would only occur during normal daytime working hours.</p> <p>Noise abatement barriers may be employed if necessary.</p>
Hazard Materials	Explosion from impact to propane filling station	<p>Construction of a shaded awning and protective bollards around the perimeter of the tank would prevent potential vehicle collision with the propane tank.</p>
Health and Human Safety	Potential exposure to valley fever	<p>Construction Phase: Use of dust suppression measures would be implemented to reduce potential exposure to valley fever.</p> <p>A brochure detailing valley fever, its cause, and symptoms would be made available to those working in the project area. The brochure would include information on how to control the spread of the illness, such as changing clothes daily, using respiratory protection, applying water to the soil, and cleaning equipment and materials.</p> <p>Breathing protection gear would be made available to all workers, at their request and at no cost to the worker.</p> <p>Workers would be educated through briefings to recognize the symptoms of valley fever, and to quickly report suspected symptoms of work-related valley fever.</p> <p>Signs would be posted at the project site notifying visitors and workers to the threat of valley fever.</p>

Notes:

BMP = best management practice

MDPA = Mojave Desert Planning Area

mph = miles per hour

O&M = operation and maintenance

SWPPP = Stormwater Pollution Prevention Plan

USFWS = U.S. Fish and Wildlife Service

2014 USFWS BO = *Biological Opinion for Operations and Activities at Fort Irwin, San Bernardino County, California* (USFWS, 2014)

Purpose and Need

1.1 Introduction

Fort Irwin is approximately 37 miles northeast of Barstow, California, in the north-central part of the High Mojave Desert, as shown on Figure 1-1. Fort Irwin encompasses approximately 1,190 square miles (761,405 acres). Approximately 80 percent of Fort Irwin's land area is used for military training. A cantonment area occupies approximately three square miles, and provides temporary and permanent living quarters for soldiers and their families along with support facilities. Fort Irwin's population includes approximately 4,450 assigned military members; 5,630 rotational soldiers; 7,200 civilian workforce; and 7,700 family members (Fort Irwin, 2015a). Training rotations occur approximately 10 times each year.

The Recreational Vehicle (RV) Park at Fort Irwin is approximately 2.75 miles north-northeast of the Fort Irwin main gate and 0.5-mile west of North Loop Road and the main cantonment area. The primary users of the RV Park are soldiers and civilian contractors associated with training rotations, retired military patrons, permanent change of station personnel, temporary duty personnel, temporary additional duty personnel, and families of those residing at Fort Irwin. In addition to soldiers and civilians residing at Fort Irwin, training rotation support is provided by 75 contractor firms that provide a variety of services. The contractor population at Fort Irwin is estimated to be several hundred during training periods. There is a high utilization rate of the RV Park by civilian contractors during these periods. Contractors often stay at the RV Park for extended time periods of longer than one month.

The RV Park provides 50 RV sites, each with 30-amp electrical service. Water is provided; however, there are no wastewater utilities provided. Each RV site has a small picnic table and an outdoor grill. The configuration of the campground is one long row of 50 back-in sites. Wastewater service is provided through two primary means, either pumping via truck service several times per month or use of a nearby vault latrine dump point. Long-term stays and overcrowding are challenges the RV Park faces. The RV sites often contain two RVs parked in one site with equipment to splice the electrical service for two units. Many individuals renting RV sites have constructed makeshift stands for television and satellite dishes. In addition, the RV Park operates an informal overflow lot located at one end of the site. The overflow lot does not provide electric or water service and is used as a parking area and for guests awaiting a formal site assignment. The overflow lot often has several occupants (Mason Norris and Associates, 2015).

1.2 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to provide adequate RV Park facilities to meet the demand for use at Fort Irwin.

Use of the Fort Irwin RV Park has steadily increased between fiscal year (FY) 2011 and FY 2014 and is likely to continue with the consistency of rotational training exercises. The RV Park does not meet the growing demand of soldiers and contractors associated with training rotations, retired military patrons, and their families. The capacity for camp sites, services, and resources are less than adequate. Currently, many guests are turned away; two RVs are parked in a single lot and electrical power is spliced, or RVs are parked in an overflow lot without power until spaces become available. Expansion of the RV Park would address demand while providing additional potential revenue to help support the Morale, Welfare, and Recreation (MWR) program.



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

□ Fort Irwin Boundary

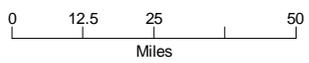


FIGURE 1-1
Vicinity Map
 RV Park Expansion EA
 Fort Irwin, CA

1.2.1 Project Objectives

The Proposed Action would achieve the following objectives:

- Meet the increased demand for use of the RV Park by soldiers and contractors associated with training rotations, retired military patrons, and their families
- Meet the service and resource needs of guests using the Fort Irwin RV Park
- Increase potential revenue from the RV Park that would support the MWR program

1.3 Scope of Analysis

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and implementing regulations specified in 40 *Code of Federal Regulations* (CFR) Part 1500 through Part 1508 and 32 CFR Part 651. The purpose of this EA is to describe the current environmental resources on and adjacent to the location of the proposed RV Park expansion plan and inform decision makers and the public of the potential environmental consequences of implementing the Proposed Action, while presenting the rationale used for evaluating and determining impacts. Mitigation measures are identified and described where warranted.

This EA identifies, documents, and evaluates the potential environmental and socioeconomic effects of the Proposed Action and seeks to ensure that appropriate consideration has been given to environmental resources. It includes a thorough evaluation of direct, indirect, and cumulative impacts, both temporary and permanent, that could occur as a result of implementing the Proposed Action. Reasonably foreseeable future actions that may contribute to cumulative effects are identified in Section 4, *Environmental Consequences*. Any additional requirements stemming from other unrelated military actions would undergo separate NEPA analysis and evaluation.

This EA also considers the potential impacts of the No Action Alternative, as required by NEPA. The No Action Alternative provides a baseline against which the potential impacts of the Proposed Action and the alternatives can be compared.

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, and military technicians has analyzed the Proposed Action and alternatives in light of existing conditions and has identified relevant beneficial and adverse effects associated with the action and alternatives.

1.3.1 Resource Areas Eliminated from Analysis

The following resource areas have been eliminated from analysis in the EA because there is no potential for impacts from the Proposed Action. These resource areas will not be discussed further in the EA.

1.3.1.1 Land Use

The Proposed Action would occur within the cantonment on land currently designated for community and training/ranges. No modifications to existing uses would occur as a result of the Proposed Action, and no changes in use of the adjacent land would occur. There would be no changes to land use as a result of the Proposed Action.

1.3.1.2 Geology, Mineral Resources, and Seismicity

The Proposed Action would not affect underlying geology or mineral resources, as disturbance would generally be limited to surface grading. Mineral resources, such as iron, gold, and potentially silver, are within the boundaries of Fort Irwin; however, no mining or exploration is carried out within the original boundaries of Fort Irwin due to an exclusion signed by President Franklin D. Roosevelt in the 1940s (U.S. Army [Army], 2006). No known mineral resources are in the project area. Seismicity would not be affected by the Proposed Action, as the project area is not underlain by a seismically active fault. The California Division of Mines and Geology (CDMG) has not identified any Alquist-Priolo Fault-Rupture

Hazard Zones in the project area (CDMG, 1999). Several Quaternary faults, which indicate evidence of seismic activity in the past 1.6 million years, occur in the Irwin Basin. The faults that show displacement include Bicycle Lake Fault, Garlic Spring Fault (which trends southeast from the cantonment), a concealed fault that parallels Garlic Spring Fault about 1,300 feet to the south, and an unnamed fault that trends approximately east-west from south of Bicycle Lake across the cantonment. However, these faults have not been active in the past 11,000 years (Army, 2006; Montgomery Watson Harza, 2003). The Proposed Action would have no effects related to the exposure of people or structures to the risk of loss, injury, or death from seismic activity as the design of any overhead structures would be based on current building codes, standards, and regulations that take into account seismic engineering provisions. The design would also satisfy the requirements of California Senate Bill 1953 (SB 1953), *Seismic Compliance Program*.

1.3.1.3 Socioeconomic Resources

Socioeconomics would not be adversely affected by the Proposed Action. The Proposed Action could be constructed and maintained by either Army personnel training at Fort Irwin or a private contractor. Depending upon who constructs the Proposed Action, there could be minor short-term beneficial effects on the local economy as a result of the construction effort.

1.3.1.4 Environmental Justice and Protection of Children

There are no populations of low-income residents, minorities, or children on or near the project area. Executive Order (EO) 13045 seeks to protect children from disproportionate environmental health or safety risks that might arise as a result of federal policies, programs, activities, and standards. The only children at Fort Irwin are associated with family housing and community facilities in the cantonment area. No impacts to environmental justice populations or children would occur as a result of the Proposed Action.

1.3.2 Resource Areas Analyzed

This EA includes an analysis of all other resource areas that could be impacted by the Proposed Action. These include the following, which are discussed in Section 3, *Affected Environment*, and Section 4, *Environmental Consequences*:

- Soils
- Biological Resources
- Water Resources
- Air Quality
- Cultural Resources
- Noise
- Utilities
- Hazardous Materials
- Health and Safety
- Aesthetics
- Recreation
- Transportation

1.4 Framework for Decision Making

The Army is the lead agency for completing a NEPA analysis for the Proposed Action. The EA will be used to identify any potentially significant effects of the Proposed Action, to identify environmental concerns in advance of project implementation, and to discuss any appropriate mitigation measures for those concerns. Agencies could use the EA to support their decision to issue approvals and/or permits for the Proposed Action.

1.5 Permits, Approvals, and Agreements Required by Other Agencies

This section lists and summarizes some of the permits and approvals that may be needed to implement the Proposed Action. This section provides the reader with a general understanding of the regulatory requirements that may need to be met before the Proposed Action is implemented. Discussions with those agencies would be required to determine the specific nature of any future permits or approvals that might be required from those agencies. Their inclusion in this document is intended to acknowledge the potential role of these agencies and ensure their notification and subsequent inclusion of any comments from them. This list is not intended to be all-inclusive; for example, a variety of permits and approvals might be needed from local and regional agencies that are not reflected in the table. In addition, the permits and approvals required would vary depending on the implementing agency.

This EA could be used to support obtaining permits and approvals from other agencies, such as the Mojave Desert Air Quality Management District (MDAQMD), which may require a permit to construct. Agency discussions and coordination would be needed to determine the specifics of any future permit or approval that may be required. MDAQMD is included in this document to acknowledge the potential role of this agency and to notify MDAQMD of the availability of this document so that their comments and concerns can be included and given due consideration.

TABLE 1-1

Permits and Approvals

RV Park Expansion Plan EA, Fort Irwin, California

Permitting or Approval Agency	Permit or Approval	Requirement	Comments
California Department of Toxic Substances Control	Various permits and approvals related to hazardous materials	The storage, transport, and disposal of hazardous materials are primarily regulated by DTSC under various federal and state regulations.	Applies to any implementing agency.
California Department of Transportation or Federal Highway Administration	Encroachment and Transportation Permits	Encroachment permits would be needed for any activities in a federal, state, or county road or highway right-of-way. Transportation permits would be needed for oversized vehicles or extralegal loads.	Applies to any implementing agency.
Lahontan Regional Water Quality Control Board	CWA Section 401 Water Quality Certification	Section 401 of the CWA requires that federally authorized discharges into Waters of the United States not violate state water quality standards.	Required if a CWA Section 402 or 404 Permit is required.
	CWA Section 402 NPDES Permit	Section 402 of the CWA authorizes states to issue NPDES permits for discharges to surface water both from point sources and non-point sources. Compliance is required for all discharges into Waters of the United States, or for construction projects that would disturb one acre or more.	Applies to any implementing agency.
	Waste Discharge Requirements, Porter-Cologne Water Quality Control Act	Waste discharge requirements are required for activities that may discharge waste in a diffuse manner (such as from soil erosion or waste discharges to land), including the discharge of waste from construction operations, and dredge and fill activities.	Activities undertaken by a federal agency are not subject to waste discharge requirements.

TABLE 1-1

Permits and Approvals*RV Park Expansion Plan EA, Fort Irwin, California*

Permitting or Approval Agency	Permit or Approval	Requirement	Comments
	Water Quality Control Plan Amendment	In accordance with the Porter-Cologne Water Quality Control Act, LRWQCB has prepared a Water Quality Control Plan that identifies the beneficial uses of water that should be protected, establishes water quality objectives (limits or levels of water constituents based on both federal and state laws), and defines an implementation program to meet water quality objectives. An amendment may be required for any alternative that is not consistent with the LRWQCB Water Quality Control Plan.	Applies to any implementing agency.
Project Lead Agency (implementing agency) and all Responsible Agencies	Project-level CEQA Compliance	CEQA applies to all discretionary activities proposed to be carried out or approved by public agencies, including state, regional, county, and local agencies in the State of California. CEQA also applies to private activities that require discretionary approval by a public agency.	CEQA does not apply to federal activities, unless such activities require a discretionary action from a public agency in California.
Project Lead Agency (federal), all Federal Cooperating Agencies, and the Advisory Council on Historic Preservation	Section 106 of the NHPA	Section 106 requires federal agencies to evaluate the effects of federal undertakings on historical, archaeological, and cultural resources. An agency is required to coordinate with the SHPO or Tribal Historic Preservation Officer and other interested parties on effects on historical, cultural, and tribal resources.	Applies to all actions on federal lands, sponsored or permitted by a federal agency, or funded with federal monies.
Project Lead Agency (implementing agency) and Various Federal, State, and Local Agencies	Land acquisition, land leases, and right-of-way acquisitions	Depending on the implementing agency, the following land acquisition, land leases, and right-of-way acquisitions may be needed: <ul style="list-style-type: none"> Federal approvals for use of federal lands Encroachment permits and approvals by public agencies for activities on public lands or public right-of-ways (approval agencies could include the California State Parks or San Bernardino County) State Lands Commission Land Use Lease for any activities on state sovereign lands Land acquisition where appropriate 	Extent and requirements for land acquisition, land leases, and right-of-way acquisitions will vary greatly depending on the final implementing agency.
Mojave Desert Air Quality Management District	CAA General Conformity Determination	The CAA Section 176(c) requires federal actions to conform to applicable federal or SIPs to ensure that the actions do not interfere with strategies employed to attain the NAAQS.	Applicable to federal actions. May require modification of the SIP emission budgets for nitrogen oxide and respirable PM ₁₀ .

TABLE 1-1
Permits and Approvals
RV Park Expansion Plan EA, Fort Irwin, California

Permitting or Approval Agency	Permit or Approval	Requirement	Comments
Mojave Desert Air Quality Management District	Permits to Construct and Operate Stationary Sources	Various air quality permits would be needed for the construction, operation, and maintenance of stationary sources such as generators, pumping plants, and treatment facilities.	Applies to any implementing agency.
Mojave Desert Air Quality Management District	Approval of Large Operation Notification (Dust Control Plan)	The purpose is to reduce the amount of particulate matter entrained in the ambient air as a result of manmade fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Compliance with this regulation would be required for a variety of alternative activities.	Applies to any implementing agency.
U.S. Army Corps of Engineers	CWA Section 404 Permit	Section 404 of the CWA requires that a permit be obtained from USACE before discharging dredge or fill material into Waters of the United States, their tributaries, and associated wetlands. Activities regulated by 404 permits include, but are not limited to, dredging, construction activities in waterways, and flood control actions.	There are no waters considered as Waters of the United States within the boundaries of Fort Irwin.
U.S. Fish and Wildlife Service	ESA Section 7 Incidental Take Statement, or Section 10 Incidental Take Permit	The ESA requires USFWS to maintain lists of threatened and endangered species and protects these listed species (and any designated critical habitat) from unauthorized take. Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. Section 10 describes how USFWS may authorize take of a listed species by non-federal agencies.	The ESA applies to any action that may result in a "may affect" determination for a federally listed species, regardless of the implementing agency.

Notes:

CAA = Clean Air Act

CEQA = California Environmental Quality Act

CWA = Clean Water Act

DTSC = California Department of Toxic Substances Control

ESA = Endangered Species Act of 1973

LRWQCB = Lahontan Regional Water Quality Control Board

NAAQS = National Ambient Air Quality Standards

NHPA = National Historic Preservation Act

NPDES = National Pollutant Discharge Elimination System

PM₁₀ = particulate matter less than 10 microns in aerodynamic diameter

SHPO = State Historic Preservation Office

SIP = State Implementation Plan

USACE = U.S. Army Corps of Engineers

USFWS = U.S. Fish and Wildlife Service

1.6 Relevant Statutes, Regulations, and Executive Orders

A decision on whether to proceed with the Proposed Action depends on numerous factors, including mission requirements, regulatory requirements, and environmental considerations. In addressing environmental considerations, Fort Irwin was guided by relevant statutes (and their implementing

regulations) and EOs that establish standards and provide guidance on environmental and natural resources management and planning.

These include, but are not necessarily limited to, the following:

Federal Statutes

- Archaeological Resources Protection Act of 1979 (16 U.S. Code [U.S.C.] 470)
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996, as amended)
- CAA (42 U.S.C. 7401 et seq., as amended)
- CWA of 1977 and the Water Quality Act of 1987 (33 U.S.C. 1251 et seq., as amended)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended by the Superfund Amendments and Reauthorization Act of 1986 [42 U.S.C. 9601 et seq.]
- ESA (16 U.S.C. 1531-1543)
- Energy Policy Act of 2005 (42 U.S.C. 15801)
- Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.)
- Migratory Bird Treaty Act (MBTA; 16 U.S.C. 701, et seq.)
- National Energy Conservation Policy Act (42 U.S.C. 8251)
- NEPA (42 U.S.C. 4321-4370)
- Noise Control Act of 1972 (42 U.S.C. 4901 - 4918)
- Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901)
- Toxic Substances Control Act (15 U.S.C. 2601 et seq., as amended)

Regulations

- Army Regulation (AR) 190-13, The Army Physical Security Program
- AR 200-1, Environmental Protection and Enhancement
- AR 210-20, Installation Master Planning
- AR 385-10, The Army Safety Program
- AR 525-13, Antiterrorism
- Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (Title 40 CFR, Parts 1500-1508 [40 CFR 1500-1508])
- Protection of Historic Properties (36 CFR Part 800)
- Environmental Analysis of Army Actions (32 CFR 651)
- Energy Independence and Security Act of 2007

Executive Orders

- EO 11514, Protection and Enhancement of Environmental Quality (amended by EO 11991)
- EO 11988, Floodplain Management
- EO 11990, Protection of Wetlands
- EO 12088, Federal Compliance with Pollution Control Standards

- EO 12372, Intergovernmental Review of Federal Programs
- EO 12580, Superfund Implementation
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 12902, Energy Efficiency and Water Conservation at Federal Facilities
- EO, 13007 Protection of Indian Sacred Sites
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risk
- EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition
- EO 13123, Greening the Government Through Efficient Energy Management
- EO 13149, Greening the Government Through Federal Fleet and Transportation Efficiency
- EO 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds
- EO 13327, Federal Real Property Asset Management (amended by EO 13423)
- EO 13693, Planning for Federal Sustainability in the Next Decade

1.7 Agency and Public Participation

The Army invites public participation in the proposed federal action. Considering the views and information of all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the decision-making process.

Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR Part 651. Upon completion of the EA, the Final EA and Draft Finding of No Significant Impact (FNSI) will be made available to the public for comment for a period of 30 days. At the end of the 30-day public review, the Army will consider all comments submitted by individuals, agencies, and organizations (Appendix A). As appropriate, the Army may then execute the FNSI and proceed with implementation of the Proposed Action. If implementing the Proposed Action was determined to result in significant effects, then the Army would publish a Notice of Intent in the *Federal Register* to prepare an environmental impact statement or would not take the action.

Throughout this process, the public may obtain information on the status and progress of the Proposed Action and the EA through Mr. Clarence Everly, Fort Irwin Directorate of Public Works, Environmental Division, Building 602, P.O. Box 105085, Fort Irwin, California, 92310-5085 or via e-mail at clarence.a.everly.civ@mail.mil.

SECTION 2

Description of Proposed Action and Alternatives

This section describes the Proposed Action and alternatives for implementing the design elements of the construction and operation of an expanded RV Park at Fort Irwin that meet the project purpose and need as described in Section 1.2. Two alternatives (the Proposed Action and the No Action Alternative) were selected for detailed analysis. No additional alternatives were considered for detailed analysis.

2.1 Proposed Action

The Proposed Action is to expand, renovate, and modernize the existing RV Park. The Proposed Action is the Preferred Alternative and includes the construction and operation of an RV Park expansion with the following components:

- The existing 50 RV sites would be provided with 20-foot by 40-foot concrete parking pads in addition to a 200-square-foot area of pavers to the right of the concrete pad that could be used for outdoor living or to park a towed vehicle.
- Construction of 59 additional RV parking sites that would include concrete parking pads, utility connections, a combination fire ring/grill, and individual picnic tables.
- Allowances for underground utility connection from the additional sites to utility primaries designed to accommodate peak season would be included as follows: potable water, including fire water distribution (500 linear feet); a sanitary sewer line (5,000 linear feet); an electrical line (3,000 linear feet) with appropriate transformers; and a fiber optic communications line (2,000 linear feet).
- Improvements to the expansion area would include enclosed dumpsters, xeriscaping, chain-link fencing, and construction of a Leadership in Energy and Environmental Design (LEED)-certified 3,665-square-foot comfort station with showers, restrooms, a game room, kitchen/dining room, meeting room, and maintenance storage.
- Installation of a 1,000-gallon-capacity propane filling station and a 25-foot by 40-foot covered concrete pad with six concrete-filled pipe bollards.
- Installation of an approximately 200-square-foot pre-manufactured RV Park registration booth that would provide check-in, information, video surveillance, general paperwork, and cashiering services.

Sustainable features on the RV Park expansion would include a silver LEED-certified comfort station building, high-efficiency lighting controls, window films/shading structures, and high-efficiency chiller. Approximately 15 acres of land would be disturbed for expansion of the RV Park. The area of disturbance, also referred to as the project area, is shown on Figure 2-1. Cement trucks and earth-moving equipment, such as bulldozers and dump trucks, would be used for construction.

2.2 No Action Alternative

Under the No Action Alternative, the proposed RV Park expansion would not be implemented and current conditions would continue into the future. There would be no impacts from construction and operation of the expanded RV Park. Under the No Action Alternative, continuation of current conditions would not meet the demand for capacity of RV spaces for soldiers, retirees, and their families. Increased revenue that would result from an expanded RV Park, which would help support the entire MWR program, would not result. Furthermore, existing patrons would continue to receive less than adequate services that are expected at facilities of this nature. The No Action Alternative is carried forward as a baseline for comparison with the Proposed Action.

2.3 Alternatives Considered but Not Carried Forward

One additional alternative for expansion of the RV Park was initially considered. This alternative included a variation on the site layout compared to the Proposed Action. It would not have included construction of a registration booth, and the storage and maintenance building would have been located separate from the comfort station. This alternative would not have resulted in less of an impact than the Proposed Action and would have been less capable of meeting the projected needs of the Fort Irwin RV Park. Because it would be less capable of meeting the purpose and need for the project, and because it would not result in reduced environmental impacts as compared with the Proposed Action, this alternative was eliminated from consideration.



- RV Expansion Area
- Proposed Sewage Line
- Existing Water Lines

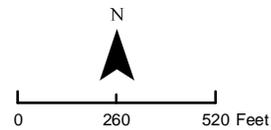


Figure 2-1
 Project Area
 RV Park Expansion EA
 Fort Irwin, CA



SECTION 3

Affected Environment

This section describes the existing environmental conditions of the Preferred Alternative area that could be affected by implementing the Proposed Action. These resources include soils, biological resources, water resources, air quality, cultural resources, noise, utilities, hazardous materials, health and safety, aesthetics, recreation, and transportation. Resources that would not be affected include land use; geology, mineral resources, and seismicity; socioeconomic resources; and environmental justice and protection of children. These resource areas are not discussed in detail because they would not be adversely affected by the Proposed Action.

3.1 Soils

The landscape near Fort Irwin is dominated by alluvial basins between mountain ranges. Mountain tops in the region have been eroded, exposing outcrops of bedrock, while the land between consists of a variety of coarse and fine sediment materials.

Soils commonly occurring in the region include coarse materials derived from mountainous rock and finer materials located on the valley floors. Soils on the alluvial fans along the bases of mountain ranges (upper bajadas) consist of coarse gravels that change to loamy gravels toward the toe of alluvial fans. Soils on the lower bajadas include sandy loams and finer loamy materials. Dry lakes (playas) at the bottom of basins have soils of silts and clays, and typically develop salt pans (USACE, 2003; Army, 2006).

Desert soils develop slowly and are fragile, becoming highly susceptible to wind and water erosion if disturbed. In addition, desert soils are highly vulnerable to compaction from activities, such as vehicle movement, that disturb the soil crusts, leaving the underlying soils vulnerable to erosion by wind and water (Army, 2006).

Desert pavement is another characteristic of the region. Desert pavement consists of a surface crust of pebbles and rocks that have developed a coating of manganese oxide due to sun exposure, rendering the surface dark and shiny. Desert pavement protects fragile soils from further erosion. Once desert pavement is removed or disturbed, reestablishment could take several thousand years (Army, 2006).

The Fort Irwin cantonment area is within a transitional area between bajadas and playas that is underlain by alluvium. The cantonment area is built on disturbed soils, so the natural structure and profile of the soil are no longer intact. The project area is slightly outside the cantonment and is located on disturbed soils.

The Natural Resources Conservation Service (NRCS) has mapped approximately 95 percent of Fort Irwin, including the Proposed Action site. The predominant soil type within the project area consists of a Fortirwin-Golddivide-Arizo complex soils. Fortirwin-Golddivide-Arizo complex soils typically occur on fan remnants derived from mixed alluvium. These soils are moderately susceptible to erosion from precipitation and moderately susceptible to wind erosion. Fortirwin-Golddivide-Arizo complex soils are highly permeable with no layers that would restrict or impede water movement (NRCS, 2015).

3.2 Biological Resources

Biological resources include plants (flora) and animals (fauna) and the habitats in which they occur. Major vegetation communities are described in terms of the representative species present, with special attention placed on special-status species afforded some level of federal, state, or local protection. General wildlife species expected to occur are described, with emphasis placed on special-status species.

3.2.1 Regulatory Considerations

Regulations concerning biological resources are discussed in Sections 3.2.1.1 through 3.2.1.3.

3.2.1.1 Endangered Species Act of 1973

The ESA (16 U.S.C. Sections 1531 et. seq.) was established to protect and allow for recovery of species in danger of extinction and their associated habitat. Under the ESA, species may be listed as endangered or threatened. Endangered species includes those in danger of extinction throughout all or a part of its range. The Threatened category includes species likely to become endangered within the foreseeable future. The ESA also protects habitat considered critical to the existence and recovery of listed species. Section 7 of the ESA specifies that any agency that proposes a federal action that could jeopardize a listed species or result in destruction or adverse modification of its habitat must participate in an interagency cooperation and consultation process with USFWS or the National Oceanic and Atmospheric Administration.

3.2.1.2 California Endangered Species Act

The purpose of the California Endangered Species Act (CESA) is to ensure all native species of flora and fauna, including their associated habitat, threatened by extinction, and/or significantly declining populations that could lead to a threatened or endangered designation, are protected. The CESA delegates the responsibility of maintaining a list of state threatened and endangered species to the California Department of Fish and Wildlife (CDFW). The CESA encourages consultation with CDFW if a proposed action may affect a state-listed species.

3.2.1.3 Migratory Bird Treaty Act

The purpose of the MBTA (16 U.S.C. Section 703 et. seq.) is to allow for protection of bird species that migrate between the United States and other countries. The MBTA states that it is unlawful to pursue, hunt, take, capture, wound, or kill a migratory bird by any means, including any part, egg, or nest unless otherwise authorized, such as within legal hunting seasons. The list of bird species protected by the MBTA is included in 50 CFR Section 10.13.

3.2.2 Biological Resources Survey

The proposed project area was surveyed for biological resources on October 29, 2015. The survey was conducted in accordance with the *Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats* (USFWS, 2010) by walking designated transects throughout all accessible and appropriate habitat within the proposed project area. Additionally, three Mohave ground squirrel/incidental wildlife camera surveys were conducted. Two were conducted by CH2M, on behalf of Fort Irwin, from March 21 through 25, 2016 and April 4 through 9, 2016, and is included in the *Natural Resources Report for the Recreational Vehicle Park at Fort Irwin, San Bernardino, California* (see Appendix B of this EA; Fort Irwin, 2016a). The Fort Irwin Environmental Division conducted a camera trapping survey from June 2 through 7, 2016 at the proposed site (Fort Irwin, 2016b).

3.2.3 Flora

The RV Park expansion area has a moderate cover and diversity of plant species (see Appendix B). The project area consists of a creosote bush (*Larrea tridentata*)-white bursage (*Ambrosia dumosa*) series vegetation community (Sawyer and Keeler-Wolf, 1995). Creosote bush and white bursage are the most common plant species throughout the site, with cheesebush (*Ambrosia salsola*) and paper bag bush (*Scutellaria mexicana*) found to be relatively common on the site. Understory, consisting primarily of Mediterranean grass (*Schismus barbatus*) and redstem filaree (*Erodium cicutarium*), was found to have very little diversity and to not provide valuable wildlife ground forage. Four non-native plant species were observed (Appendix B), and occurred in small, disparate patches primarily where there is more vehicular traffic. All plant species observed are identified in Appendix B of this EA.

3.2.3.1 Special-status Flora

Special-status flora species of interest include the following:

- Species listed as threatened, endangered, proposed for listing, or candidate for listing under the ESA
- Species designated by the Bureau of Land Management (BLM) as sensitive that require special management consideration
- Species designated by USFWS as Species of Concern, representing those species formerly designated as candidates for listing as endangered or threatened, but for which information is insufficient to make a determination
- Species listed as threatened or endangered under the CESA by CDFW
- Species designated by the California Native Plant Society (CNPS) as Category 1B (rare, threatened, or endangered in California and elsewhere) or Category 2 (rare, threatened, or endangered in California, but more common elsewhere)

3.2.3.2 Special-status Species Descriptions

One federally endangered plant species has been identified on Fort Irwin. USFWS listed the Lane Mountain milkvetch as endangered on October 6, 1998. The species also is designated as CNPS Category 1B. Lane Mountain milkvetch occurs in Joshua tree woodland, mixed Mojave scrub, and creosote bush scrub in poorly developed sandy or granitic gravelly soils. Known populations of Lane Mountain milkvetch typically occur at elevations ranging from 3,100 to 4,200 feet above mean sea level and generally occur in areas of small ridges, shallow bedrock, and granitic soils. Known occurrences are in Mojave creosote bush scrub and Mojave mixed woody scrub communities with diverse shrub assemblages. Lane Mountain milkvetch is weakly erect and typically uses turpentine broom (*Thamnosma montana*), bursage, Eastern Mojave buckwheat (*Eriogonum fasciculatum*), Cooper's goldenbush (*Ericameria cooperi*), and Nevada jointfir (*Ephedra nevadensis*) for support (Army, 2006).

Three major populations of Lane Mountain milkvetch have been mapped on Fort Irwin within a 21,000-acre area, mostly within the Western Expansion Area, which is in the western portion of Fort Irwin. All three populations are more than four miles from the proposed project area (Army, 2006). The highest elevation within and near the proposed project area is less than 2,700 feet, which is lower than elevations this species typically occurs in. Lane Mountain milkvetch also prefers a diverse assemblage of plants within its habitat, and the plant diversity within or near the proposed project area is low, due to a high level of degradation and sparse vegetation cover (Appendix B). This plant was not observed during the natural resource survey, and is not expected to occur, as the habitat on the site is only marginally suitable.

The alkali mariposa lily (*Calochortus striatus*) is a federal Species of Concern and is a CNPS Category 1B species. The alkali mariposa lily occurs in creosote brush scrub communities in the Mojave Desert and occurs in the California Mojave Desert in small scattered populations in Kern, Los Angeles, and San Bernardino counties. Alkali mariposa lily grows in alkaline meadows and moist creosote bush scrub plant communities where it flowers in the spring from April to June. The alkali mariposa lily has been observed at Two Springs and at Paradise Springs, both outside of the Fort Irwin cantonment and not near the proposed project area (Army, 2006). This plant was not observed during the natural resource survey and is not expected to occur due to the lack of suitable habitat on the site.

Populations of Clokey's cryptantha (*Cryptantha clokeyii*) are uncommon but occur in rocky areas surrounding Superior Valley and Paradise Valley, both outside of Fort Irwin. This species is a small annual in the Boraginaceae family and is designated as CNPS Category 1B. Plants typically occur in gravelly areas of course colluvium substrate, most frequently on upper slopes. This plant was not observed during the natural resource survey, but it has a moderate potential to occur due to the presence of suitable habitat on the site.

The small-flowered androstephium (*Androstephium breviflorum*) is a CNPS Category 2 species. Small-flowered androstephium is a white-flowered perennial herb of the lily family (Liliaceae). In California, small-flowered androstephium primarily occurs in open sandy flats and in bajadas at low to moderate elevations (Army, 2006). This species does not occur on the proposed project area and is not known to occur in the vicinity.

The desert cymopterus (*Cymopterus deserticola*) is BLM-designated as sensitive and a CNPS Category 1B species. This herbaceous perennial in the carrot family (Apiaceae) typically occurs on deep, loose, well-drained sandy soil in alluvial fans and basins. The desert cymopterus also occurs on stabilized low sand dune areas and occasionally on sandy slopes. A population of desert cymopterus has been documented in the Superior Valley, just south of the Naval Air Weapons Station (NAWS) China Lake boundary. Several additional populations, estimated to contain several thousand plants, have been observed in the Superior Valley (Army, 2006). A 346-acre area within the Western Expansion Area has been designated as Desert Cymopterus Conservation Area. This conservation area contains at least 366 individuals of the species and is more than four miles southwest of the proposed project area (Army, 2006). This plant was not observed during the natural resource survey, and is not expected to occur due to the absence of suitable habitat on the site.

The Barstow woolly sunflower (*Eriophyllum mohavense*) is a federal Species of Concern, a BLM-designated sensitive species, and a CNPS Category 1B species. Barstow woolly sunflower is a small annual in the sunflower family (Asteraceae) and typically occurs in creosote bush scrub adjacent to, or within, an overstory of Joshua trees and saltbush scrub. The Barstow woolly sunflower occurs in open, flat, barren sites, most commonly on the sandy margins of alkali depressions distributed among the more common creosote bush plant community. The range of the Barstow woolly sunflower is limited to the west-central Mojave Desert. All known locations of Barstow woolly sunflower are south, southwest, and west of Fort Irwin, with the closest known population on Coolgardie Mesa, approximately 5 miles from Fort Irwin (Army, 2006). This species is not known or expected to occur on or near the proposed project area due to a lack of habitat.

The Mojave monkeyflower (*Mimulus mohavensis*) is a federal Species of Concern and a CNPS Category 1B species. An annual plant, the Mojave monkeyflower is a member historically placed in the figwort family (Scrophulariaceae), although recent evidence indicates it should more correctly be placed in the lopseed family (Phrymaceae). Mojave monkeyflower occurs in Joshua tree woodland and creosote bush scrub, primarily in granitic soils on gravelly banks of desert washes, in sandy openings between creosote bushes and along badland slopes above washes (areas that are not subject to regular water flows). The species range is within the Mojave Desert of California, generally occurring south of Fort Irwin, with the highest density of occurrence in areas just south of Daggett and Barstow. All recorded occurrences of the Mojave monkeyflower are outside the proposed project area, to the south and southwest. This species was not observed within the proposed project area and would not be expected to occur within the proposed project area due to lack of suitable habitat and because the habitat within the proposed project area is degraded.

3.2.3.3 Field Survey Results

None of the rare or endangered plants were observed within the construction limits of the Proposed Action. The construction area of the Proposed Action likely would not provide suitable habitat for any of the rare or endangered species, due to the level of previous disturbance and due to the recurring disturbances from human activity.

3.2.4 Fauna

Wildlife typical of Fort Irwin includes a variety of species adapted to the xeric conditions and the desert scrub habitats that provide little cover. Isolated seeps and springs provide perennial sources of water and support vegetative cover, leading to increased wildlife diversity in these areas. Rocky terrain provides additional cover and habitat for various reptile, rodent, bat, and bird species. Playas may

support seasonal wetlands or pools with brine shrimp (*Artemia* sp.), which in turn may support migratory waterbirds. Lack of specialized aquatic habitat contributes to the absence of native amphibian and fish populations on the installation.

Game species include quail (*Callipepla* sp.), dove (*Zenaida macroura*), chukar (*Alectoris chukar*), desert cottontail rabbit (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*). Larger mammals that may occur in the Fort Irwin area include badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), grey fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), big-horn sheep (*Ovis canadensis nelsoni*) and mountain lion (*Felis concolor*).

Abandoned mines, natural caves, trees, and built structures throughout the installation provide potential roosting habitat for bats. Bats also use the many cliff faces and rocky ledges of mountain ranges as sites for roosting; bats also could use Joshua trees as night roosts. The western pipistrelle (*Pipistrellus hesperus*) and California myotis (*Myotis californicus*) are the most common bat species.

3.2.4.1 General Wildlife

Wildlife Habitat

The proposed project area would provide marginally suitable habitat for wildlife species. The project area is within 0.5-mile of the cantonment area and adjacent to heavily developed areas. Presently, the habitat is degraded compared with habitat further outside of the cantonment area. Several roads including the existing RV Park road and a network of roads connecting a series of previously used earthen bunkers bound the project area. The amount of human activity would likely limit the use of the project area by wildlife, except for those adapted to human activity. No burrows were observed within the project area. Use of the project area by wildlife would likely be limited to foraging and transient wildlife.

Mammals

Small mammals potentially occurring within the cantonment and proposed project area would include common species such as black-tailed jackrabbit, desert cottontail, and white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), kangaroo rats (*Dipodomys* spp.), pocket mice (*Chaetodipus formosus*; *Chaetodipus penicillatus*; *Perognathus* spp.), and field mice (*Peromyscus* spp.). Desert woodrat (*Neotoma lepida*) and Botta's pocket gopher (*Thomomys bottae*) are common on Fort Irwin and could occur in the proposed project area. Wild burros (*Equus asinus*) have been observed near the cantonment and could forage within the project area. Coyote are known to occur near the cantonment, as well as kit fox. Coyote and kit fox that inhabit the area have most likely become acclimated to activities within and around the cantonment. The western pipistrelle and California myotis have been observed foraging at the wastewater treatment plant (WWTP) ponds, and could forage within the proposed project area, but would be unlikely.

Birds

Common bird species potentially occurring in or near the proposed project area include the American robin (*Turdus migratorius*), mourning dove (*Zenaida macroura*), house sparrow (*Passer domesticus*), black-throated sparrow (*Amphispiza bilineata*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), and greater roadrunner (*Geococcyx californianus*). Habitat within and near the project area would provide suitable nesting and foraging habitat for common bird species adapted to arid conditions. Additional species could occur as migrants within the proposed project area. Some common species include the yellow-rumped warbler (*Dendroica coronata*), Hutton's vireo (*Vireo huttoni*), cliff swallow (*Hirundo pyrrhonata*), ruby-crowned kinglet (*Regulus calendula*), and white-crowned sparrow (*Zonotrichia leucophrys*). Raptors that have been observed near the cantonment include red-tailed hawks (*Buteo jamaicensis*), northern harriers (*Circus cyaneus*), golden eagles (*Aquila chrysaetos*), and prairie falcons (*Falco mexicanus*); however, due to the lack of suitable habitat and degree of human presence, use of the project area would likely be limited to foraging

activities. It is unlikely the barn owl (*Tyto alba*) would occur within the proposed project area. One burrowing owl (*Athene cunicularia*) was observed within the project boundary during a camera trapping survey event in April 2016 (Fort Irwin, 2016a). However, no burrows, signs, or activity were observed during the field survey of the project area. No suitable breeding habitat was observed within the project area, so it is likely the burrowing owl was using the site to forage. Burrowing owl could occur within the proposed project area but would likely only occur while foraging.

Reptiles and Amphibians

The project area consists of marginally suitable habitat for most reptile species. Some common species around the cantonment include common lizards, such as zebra-tailed lizards (*Callisaurus draconoides*), side-blotched lizards (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), and western whiptails (*Cnemidophorus tigris*). Lesser common species around the cantonment include the desert horned lizard (*Phrynosoma platyrhinos*), long-nosed leopard lizard (*Gambelia wislizenii*), and desert iguana (*Dipsosaurus dorsalis*).

Common snake species include the coachwhip (*Masticophis flagellum*), gopher snake (*Pituophis melanoleucus*), western patch-nosed snake (*Salvadora hexalepis*), western shovel-nosed snake (*Chionactis occipitalis*), and Mojave sidewinder (*Crotalus cerastes*). Other species that could occur include the blind snake (*Leptotyphlops humulis*), ground snake (*Sonora semiannulata*), southwestern speckled rattlesnake (*Crotalus mitchellii pyrrhus*), and the northern Mojave rattlesnake (*Crotalus scutulatus*). No snake species were observed during the field survey.

The desert tortoise occurs in varying densities throughout Fort Irwin and the surrounding area and has been known to occur within the cantonment on occasion. However, signs of individuals of this species were not observed within the proposed project area during the field survey.

3.2.4.2 Special-status Fauna

Following are special-status faunal species considered:

- Species listed as threatened, endangered, proposed for listing, or candidate for listing under the ESA
- Species designated by the BLM as sensitive that require special management consideration
- Species designated by USFWS as Species of Concern, representing those species formerly designated as candidates for listing as endangered or threatened, but for which information is insufficient to make a determination
- Species listed by the CDFW as threatened or endangered under the CESA
- Species designated by CDFW as Species of Special Concern

The remainder of this section discusses special status species that have potential to occur at Fort Irwin.

Birds

Peregrine Falcon (*Falco peregrinus anatum*)

This subspecies was delisted from federal endangered status in August 1999; however, it is state endangered. This subspecies of peregrine falcon occurs primarily in the western United States. During winter, they occur throughout most of California. Summer range is more restricted to northern California, along the coast from Santa Barbara northward, and in the Sierra Nevada Mountains. Peregrines typically nest on high cliffs or, less commonly, on buildings and structures in urban areas. The species forages over wetlands or other habitats with large concentrations of birds, which are their primary food source. Peregrines are uncommon winter migrants to the West Mojave. This subspecies would not be expected to occur within the proposed project area but could use the habitat within and adjacent to the project area for foraging.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

This species was listed as federally endangered in 1995. Southwestern willow flycatcher breeds in riparian woodland habitats with willows (*Salix* spp.), cottonwoods (*Populus* spp.), and/or alders (*Alnus* spp.). Scattered records exist of this species occurring at various locations throughout Fort Irwin; however, in all cases, the observations represented transient birds detected during spring and fall migration at springs and along riparian areas. While the southwestern willow flycatcher is a summer resident in the region, the species is not expected to breed at Fort Irwin because of a lack of appropriate habitat. There is no suitable habitat for this species within the proposed project area and it would be highly unlikely that this species would occur within the proposed project area.

Least Bell's Vireo (*Vireo bellii pusillus*)

This species was listed as federally endangered in 1986. The least Bell's vireo is a summer resident in the region and breeds in riparian habitat, preferring areas of dense mulefat (*Baccharis salicifolia*) with an overstory of willows. In 1986, a least Bell's vireo was observed on Fort Irwin at Bitter Springs. This species is not expected to occur regularly at Fort Irwin because of the lack of suitable habitat; however, it may occur near springs for brief periods during migration. There are no springs located on or near the proposed project area. Therefore, it would be highly unlikely that this species would occur within the proposed project area.

Burrowing Owl (*Athene cunicularia*)

Burrowing owl is a California Species of Special Concern and is protected by the MBTA. The burrowing owl's nesting habitat consists of open areas with mammal burrows. Habitats include dry, open, rolling hills, grasslands, fallow fields, sparsely vegetated desert scrub with gullies, washes, arroyos, and edges of human-disturbed lands. They have been known to inhabit golf courses, airports, cemeteries, vacant lots, and road embankments, wherever there is sufficient friable soil for a nesting burrow. In addition to burrows, the owls also require perching locations and frequently use fence posts or the top of mounds outside the burrow. Burrowing owls typically use burrows created by other animals, such as prairie dogs, kangaroo rats, ground squirrels—and especially burrows constructed by California ground squirrels, kit foxes, and desert tortoises. This species has been observed intermittently near the cantonment and there is potential for it to occur in or adjacent to the proposed project area. There have been four sightings of this species within a one-mile buffer around the project area based on historical geographic information system (GIS) data collected by Fort Irwin. One burrowing owl was observed within the project boundary during a camera trapping survey event in April 2016 (Fort Irwin, 2016a). Prior to the recent burrowing owl on camera, the most recent sighting was on July 8, 2011, which was approximately 0.3-mile west of the RV Park expansion area (Fort Irwin, 2016c). No suitable breeding habitat was observed within the project area, so the burrowing owl was likely using the site to forage.

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)

The yellow-headed blackbird is a California Species of Concern and is protected by the MBTA. The species generally occurs in California as a migrant or summer resident, but small numbers winter in the southern deserts. Preferred breeding habitat includes marshes and wetlands with tall emergent vegetation, and the blackbird may forage in surrounding wetlands, grasslands, and croplands. Yellow-headed blackbirds breed at scattered sites throughout the Mojave Desert. Small numbers breed regularly near Victorville, Barstow, and Newberry Springs in San Bernardino County. Marginally suitable foraging habitat for this species occurs within the project area, but no suitable nesting habitat occurs.

California Black Rail (*Laterallus jamaicensis coturniculus*)

This species was listed as state threatened in 1971. The California black rail is an uncommon, local resident of marshes, swamps, and wet meadows. A black rail was observed at the WWTP evaporation and percolation ponds at Fort Irwin during fall 1994, but it has not been observed on the installation

since. The occurrence of this species in the central Mojave Desert is extremely unusual, and it would be highly unlikely to occur in the proposed project area because of the lack of suitable habitat.

Swainson's Hawk (*Buteo swainsoni*)

This species was listed as state threatened in 1983. The Swainson's hawk was once a widespread breeder in the non-forested areas of northern California and the Central Valley. This species is migratory and is not expected to occur regularly at Fort Irwin or forage in the area for prolonged periods. Swainson's hawk has been observed at Bitter Springs, but it would be unlikely for the species to use the proposed project area.

Reptiles

Mojave Fringe-toed Lizard (*Uma scoparia*)

The Mojave fringe-toed lizard is a CDFW-designated Species of Special Concern and BLM-designated sensitive species. This species is endemic to southern California and a small area of western Arizona, where it is restricted to aeolian sand habitats in the deserts of Los Angeles, Riverside, and San Bernardino counties in California and La Paz County in Arizona. Mojave fringe-toed lizards are restricted to areas with fine, aeolian sand, including both large and small dunes, margins of dry lakebeds and washes, and isolated pockets against hillsides. The loose wind-blown sand habitat upon which the Mojave fringe-toed lizard depends is a fragile ecosystem requiring protection against both direct and indirect disturbances. The Mojave fringe-toed lizard is known to occur near Bitter Springs, in the dunes just east of Red Pass Lake, and the sand sheets on the west side of a large rock formation known as the "Whale" (Army, 2006). This species is not expected to occur within the proposed project area due to a lack of suitable habitat.

Desert Tortoise (*Gopherus agassizii*)

This species was listed as federally threatened in 1990. USFWS determined that the Mojave population of the desert tortoise warranted listing in response to documented population declines over large portions of its range due to a number of reasons, including upper respiratory tract disease exacerbated by the stress of several drought seasons, loss of habitat, predation by ravens, livestock grazing, and direct disturbance by humans.

Desert tortoise is a large, herbivorous reptile that occurs throughout much of the Mojave and Sonoran deserts; its range roughly approximates the distribution of creosote bush scrub. The desert tortoise is active in the spring, summer, and autumn when daytime temperatures are below 90 degrees Fahrenheit (°F; 32 degrees Celsius). Most activity occurs during spring and early summer.

The desert tortoise is well-studied at Fort Irwin, with the distribution and estimated sizes of populations documented throughout the installation. The desert tortoise occurs throughout Fort Irwin in low numbers, with the highest concentration along the southern boundary (Army, 2006). Historical Fort Irwin geographic information system data of live and dead desert tortoise occurrences ranging from 1994 to 2015 indicate that 19 live and six dead desert tortoises were observed within a one-mile buffer of the project area during this period (Fort Irwin, 2016d). The most recent sighting of a desert tortoise within the one-mile buffer was on April 23, 2011, approximately one mile east of the RV Park expansion area along Goldstone Road. On August 23, 2005, a desert tortoise carcass was found in the RV parking lot. No desert tortoises were observed within the RV Park expansion area (Appendix B).

Surveys for desert tortoise were conducted at the proposed project area in accordance with the *Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats* (USFWS, 2010). No recent signs of this species were observed during the field survey. No desert tortoises, their burrows, or sign of desert tortoise was observed during the survey. The habitat within the project area is marginally suitable for desert tortoise and desert tortoise could occur within the project area, but would be unlikely (Appendix B).

Mammals

Mohave Ground Squirrel (*Xerospermophilus mohavensis*)

This species was listed as state threatened in 1971. The Mohave ground squirrel generally occurs in habitat that consists of large alluvial-filled valleys with deep, fine- to medium-textured soils vegetated with creosote scrub, shadscale scrub, or alkali sink scrub with an absence of desert pavement and shallow eroded soils. Mohave ground squirrel populations at Fort Irwin are known from the Goldstone area and immediately east of the Gary Owen impact area (Army, 2006). The current status of these populations is unknown. Fort Irwin maintains a geospatial database of all known sightings of this species on the installation. Most sightings were from trapping surveys conducted on Fort Irwin.

This species is not known to occur in the project area. The nearest Mohave ground squirrel population is approximately four miles west of the project within the National Aeronautics and Space Administration (NASA)/Goldstone complex. The nearest individual was observed at the same location. Populations of this species have not been observed east of this western-most population since the 1980s (Fort Irwin, 2015b). The habitat and vegetation within and near the project area has been degraded from previous uses and would not provide suitable habitat for the species. The project area was previously cleared of vegetation because it was used as an ammunition storage area up until 1984. The soils within the project area would likely not be suitable for long-term habitation by the Mohave ground squirrel. The wash and rill-dominated landscape within the project area are not typically preferred by the Mohave ground squirrel (Appendix B). In addition, the habitat in and near the proposed project area does not include the presence of spiny hopsage (*Grayia spinosa*), winterfat (*Krascheninnikovia lanata*), or freckled milk-vetch (*Astragalus lentiginosus*), which are primary food sources for the species (Army, 2006; Appendix B). Due to there being a moderate potential for the species to occur, camera trapping surveys for the Mohave ground squirrel were conducted March 21 through 25, 2016, April 4 through 9, 2016 and June 2 through 7, 2016. No Mohave ground squirrels were photographed during the survey.

Desert Kit Fox (*Vulpes macrotis arsipus*)

This species is not listed, but the status of this species is under review in California and is considered vulnerable from habitat displacement due to the continued expansion of solar and wind projects into its preferred habitat. Kit fox generally prefer open desert, shrubby, or shrub-grass habitat. In the Mojave Desert it typically occurs in creosote bush. This nocturnal species forages at night and typically resides in a den/burrow during the day, which is where young are born (NatureServe, 2015). This species is known to occur in the vicinity of the cantonment (Appendix B). No active burrows were observed during the field survey; however, kit fox could use the project area for foraging.

Other Special-Status Fauna

The WWTP percolation and evaporation ponds, which are on the southeast side of the cantonment, attract additional bird species, including some special-status species; however, it is unlikely that any of these species would utilize the proposed project area, except for occasional foraging opportunities, because of unsuitable habitat and degree of human activity. Bird surveys of the WWTP percolation ponds and 22-acre evaporation pond from 1994 observed the following special-status species, some of which were previously mentioned (Montgomery Watson Harza, 2003):

- American white pelican (*Pelecanus erythrorhynchos*)
- California gull (*Larus californicus*)
- White-faced ibis (*Plegadis chihi*)
- Golden eagle (*Aquila chrysaetos*)
- Northern harrier (*Circus cyaneus*)
- Ferruginous hawk (*Buteo regalis*)
- Sharp-shinned hawk (*Accipiter striatus*)
- Cooper's hawk (*Accipiter cooperii*)

- Prairie falcon (*Falco mexicanus*)
- Osprey (*Pandion haliaetus*)
- LeConte's thrasher (*Toxostoma lecontei*)
- Loggerhead shrike (*Lanius ludovicianus*)
- California black rail (*Laterallus jamaicensis*)

The project area has a high level of human activity and would not provide suitable habitat for many of the special-status species except for foraging. The project area could provide marginally suitable habitat for the Bendire's thrasher, burrowing owl, and Crissal thrasher, but any occurrence would be unlikely. There is moderate potential for the loggerhead shrike to occur in the project area as marginally suitable foraging habitat is present and loggerhead shrikes have been observed in the nearby area (Fort Irwin, 2016a). A list of other special-status species that may occur in or around the cantonment, their habitat requirements, and information on potential for occurrence in the proposed project area is provided in Table 3-1.

TABLE 3-1
Special-status Species that May Occur in the Project Vicinity
RV Park Expansion Plan EA, Fort Irwin, California

Species	Status	Habitat	Potential Occurrence
Bendire's thrasher	SSC	Open desert	Unlikely
Black tern	SSC	Wetlands	Highly Unlikely
Burrowing owl	SSC	Open desert	Unlikely
Crissal thrasher	SSC	Open desert	Unlikely
Gray vireo	SSC	Woodlands	Highly Unlikely
LeConte's thrasher	SSC	Open desert	Unlikely
Loggerhead Shrike	SSC	Open desert	Moderate
Vaux's swift	SSC	Open desert, cliff sites	Highly Unlikely
Vermillion flycatcher	SSC	Riparian	Highly Unlikely
Virginia's warbler	SSC	Riparian	Highly Unlikely
Yellow warbler	SSC	Riparian	Highly Unlikely
Yellow-breasted chat	SSC	Riparian	Highly Unlikely

Note:

SSC = California Species of Special Concern

3.2.4.3 Field Survey Results

No sensitive faunal species were observed during the October 2015 field survey. A camera survey conducted in April 2016 captured one burrowing owl in the project area. No listed species and no species of conservation concern were detected within the project area during the March 2016 camera survey or the additional June 2016 camera survey conducted by the Fort Irwin Environmental Division.

Wildlife observations were limited, likely due to the degree of human presence and previous disturbances. Commonly observed wildlife included species such as the antelope ground squirrel, pocket mouse, Merriam's kangaroo rat (*Dipodomys merriami*), black-tailed jackrabbit, turkey vulture (*Cathartes aura*), California whiptail, and zebra-tailed lizard. A full list of faunal species observed is provided in Appendix B.

During field surveys of the proposed project area, no desert tortoises, scat, carcasses, or active burrows were observed. With the lack of preferred vegetation, proximity to developed areas, and high degree of disturbance, the proposed project area would provide marginally suitable habitat for the desert tortoise.

3.2.4.4 Pest Species

Common ravens (*Corvus corax*) are native in the Mojave Desert; however, their numbers have increased substantially as a result of expanding human use of the desert. Raven populations have grown beyond the natural carrying capacity of the desert environment because of resources provided by humans. Because ravens are known to prey on juvenile desert tortoises, increased populations of ravens could have negative effects on desert tortoise populations at Fort Irwin (Army, 2006). The potential availability of trash could attract common ravens and turkey vultures. Wild burros were not observed in the project area, but could forage within the project area. Coyotes are also known to occur and any coyotes that inhabit the area have most likely become acclimated to human traffic.

3.3 Water Resources

This section describes water resources, both surface and ground, within the project area.

3.3.1 Surface Water

Surface water resources are scarce at Fort Irwin and its surrounding region. Washes descending from mountains and other elevated landforms provide intermittent channels that route stormwater runoff into basins to store water until percolation or evaporation occurs. All streams are intermittent, and naturally occurring standing water is ephemeral, evident only during and immediately after heavy rains. Levees have been erected to protect the cantonment from floodwaters. Substantial water flow and accumulation takes place only during greater-than-normal storm events, which are expected to occur approximately once every 10 years (Army, 2006). No surface waters are present at the location of the proposed project.

Alluvial fans are commonly observed in and around Fort Irwin. Bedload material composed of sand, gravel, cobbles, and rocks is deposited in alluvial fans during heavy rainfall events. Significant subsurface flows may occur in the unconsolidated sand and gravel channel deposits in washes and alluvial fans, even after surface flows have ceased. Local groundwater recharge could occur along washes where water temporarily pools (Army, 2006).

Fort Irwin has six springs that produce small quantities of water and four intermittent springs that produce little to no water during the summer, depending on the seasonal amount of rainfall (Army, 2006). No springs are located in the immediate vicinity of the proposed project area.

There are two drainage patterns to the north and south of the project area where most rainfall/runoff is concentrated. Both drainages convey flow to the east towards a cement lined drainage system that runs along the north and west side of the cantonment.

The State of California regulates waters that may not be regulated by USACE. These are “Waters of the State of California” under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7), effective January 1, 2014. There are no state waters in the proposed project area.

3.3.1.1 Waters of the United States Including Wetlands

Waters of the United States include rivers, streams, estuaries, and most ponds, lakes, and wetlands. The CWA delegates authority over Waters of the United States to USACE and the U.S. Environmental Protection Agency (EPA). Wetlands are transitional areas between terrestrial and aquatic systems. As defined by USACE and EPA, wetlands must have one or more of the following three attributes:

- At least periodically, the land supports predominantly hydrophytes.
- The substrate is predominantly undrained hydric soil.

- The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

No wetlands or other Waters of the United States occur within the proposed project area, as evidenced by the lack of hydrophytic vegetation, hydric soil, or standing shallow water.

Guidelines for arid regions state that the presence of native riparian species in a dry wash indicates that the stream channel usually exhibits surface flow during small and moderate storm events (Army, 2006). No washes that meet the conditions specified in the USACE guidelines were identified within the proposed project area.

3.3.2 Groundwater

Several groundwater basins have been identified within the vicinity of Fort Irwin, including Bicycle Lake, Capital City, Coyote Lake, Goldstone Lake, Irwin, Langford Lake, and Superior Lake Basin. The Fort Irwin water supply is provided by wells from a combination of the Bicycle Lake Basin, Langford Lake Basin, and Irwin Basin, all of which occur within the confines of the Fort Irwin boundary and are located near the cantonment. The Irwin Basin is located at the cantonment. Fort Irwin withdraws more water from the aquifers than is being replenished, except for the Irwin Basin (Fort Irwin, 2014). Beginning in 1992, artificial recharge rates from percolation of treated sewage to the groundwater has exceeded pumpage rates and has stabilized water-level declines in the Irwin Basin (U.S. Geological Survey [USGS], 2003). To reduce groundwater withdrawals, Fort Irwin has implemented conservation measures and recently completed a new water treatment plant that would be more efficient. Fort Irwin has contracted with USGS to identify future water sources within the boundaries of the installation (Fort Irwin, 2014).

Based on an average pumping rate of 3.5 million gallons per day (mgd) and a water level floor elevation of either 1,700 feet mean sea level or 1,900 feet mean sea level, it is estimated that the water level in the Irwin Basin would continue to increase, due to artificial recharge, while the Bicycle Basin could sustain production through 2050, and production in the Langford Basin would decline below sustainable levels between 2035 and 2050. If the average pumpage rate was doubled to 7.0 mgd, it is estimated that the Irwin Basin water level would continue to increase, through artificial recharge, and the Bicycle Lake Basin could sustain production levels until 2030 or 2043, while the Langford Lake Basin would sustain production until 2023 or 2035. The local basins can continue to meet current water demands using existing wells and pumping system approximately through year 2035 (Fort Irwin, 2007).

Fort Irwin monitors the quality of its groundwater because it is the only source for drinking water. Water from wells in all three basins has high fluoride concentrations, with 90 percent of all wells sampled having fluoride above the California maximum contaminant level of 2 milligrams per liter. Arsenic has also been detected at concentrations above the state maximum contaminant level of 10 micrograms per liter in 80 percent of the wells sampled. Potential sources of both fluoride and arsenic are the volcanic rocks common to the area. Water used for drinking is treated to required standards.

3.4 Air Quality

This section describes the air quality at Fort Irwin and in the Mojave Desert region and discusses regulatory considerations.

3.4.1 Regulatory Setting

3.4.1.1 Federal

Federal air quality policies are regulated through the federal CAA. Pursuant to this act, EPA has established NAAQS for the following air pollutants (termed “criteria” pollutants): carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter defined as particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), fine particulate matter defined as particulate matter less than 2.5 microns in aerodynamic diameter (PM_{2.5}), and lead (Table 3-2).

TABLE 3-2

Ambient Air Quality Standards*RV Park Expansion Plan EA, Fort Irwin, California*

Criteria Pollutant	Federal Standard (Averaging Period) ^a	Federal Attainment Status	State Standard (Averaging Period) ^b	State Attainment Status
CO	35 ppm (1 hour)	Attainment	20 ppm (1 hour)	Attainment
	9 ppm (8 hours)	Attainment	9 ppm (8 hours)	Attainment
NO ₂	0.100 ppm (1 hour)	Attainment	0.18 ppm (1 hour)	Attainment
	0.053 ppm (annual arithmetic mean)		0.030 ppm (annual arithmetic mean)	
O ₃	0.070 ppm (8 hours)	Attainment ^c	0.070 ppm (8 hours)	Non-attainment
			0.09 ppm (1 hour)	Non-attainment
PM _{2.5}	12 µg/m ³ (annual arithmetic mean)	Unclassified/Attainment	12 µg/m ³ (annual arithmetic mean)	Non-attainment
	35 µg/m ³ (24 hours) ^d	Unclassified/Attainment	No separate Standard (24 hours)	
PM ₁₀	–	NA	20 µg/m ³ (annual arithmetic mean)	Non-attainment
	150 µg/m ³ (24 hours)	Non-attainment	50 µg/m ³ (24 hours)	Non-attainment
SO ₂	--	--	0.04 ppm (24 hours)	Attainment
	0.5 ppm (3 hours, secondary standard)	Unclassified/Attainment	--	--
	0.075 ppm (1 hour) ^d	Unclassified	0.25 ppm (1 hour)	Attainment
Lead ^e	0.15 µg/m ³ (rolling 3-month average)	Attainment	1.5 µg/m ³ (30-day average)	Attainment
Sulfates			25 µg/m ³ (24 hours)	Attainment
Hydrogen sulfide			0.03 ppm (1 hour)	Unclassified
Vinyl chloride ^e			0.01 ppm (24 hours)	Attainment
Visibility-reducing particles	No federal standards		Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent	Unclassified

Source: <http://www.arb.ca.gov/research/aaqs/aaqs.htm>, <http://www3.epa.gov/ttn/naaqs/criteria.html>, as of February 2016.

µg/m³ = micrograms per cubic meter

ppm = parts per million, by volume

NA = not applicable

Notes:

^a National standards other than O₃, particulate matter, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, is equal to or less than the standard.

^b California standards for O₃, CO, SO₂ (one hour and 24 hours), NO₂, and suspended particulate matter (PM₁₀, PM_{2.5}, and visibility-reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded.

TABLE 3-2

Ambient Air Quality Standards*RV Park Expansion Plan EA, Fort Irwin, California*

Criteria Pollutant	Federal Standard (Averaging Period) ^a	Federal Attainment Status	State Standard (Averaging Period) ^b	State Attainment Status
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^c The southern portion of the installation (below the 90 Universal Transverse Mercator [UTM] grid line) is designated non-attainment for O₃ for federal standards.

^d To attain this standard, the three-year average of the 99th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 75 ppb.

^e The California Air Resources Board (ARB) has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. This determination was made following the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

The act was amended in 1977 to require each state to maintain a SIP for achieving compliance with the NAAQS. In 1990, the act was amended again to strengthen regulation of emissions from both stationary sources and motor vehicles. The CAA also requires EPA to designate areas (counties or air basins) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the area meets NAAQS. An area that is designated non-attainment does not meet one or more NAAQS, and is subject to planning requirements to attain the standard. Conformity of a proposed action to the required planning documents or SIP is defined under the 1990 CAA amendments as conformity with the plan's purpose in eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of these standards.

Under the 1990 CAA amendments, EPA issued two types of SIP conformity guidelines: (1) transportation conformity rules that apply to transportation plans and projects and (2) general conformity rules that apply to all other federal actions. The following section discusses general conformity and how these requirements apply to the Proposed Action.

General Conformity

EPA has issued regulations addressing the applicability and procedures for ensuring that federal activities comply with the amended CAA. The EPA Final Conformity Rule requires federal agencies to ensure that federal actions resulting in non-attainment or maintenance criteria pollutant emissions conform to an approved or promulgated state or federal implementation plan. This ensures that a federal action would not meet any of the following criteria:

- Cause a new violation of the NAAQS
- Contribute to any increase in the frequency or severity of violations of existing NAAQS
- Delay the timely attainment of any NAAQS interim or other attainment milestones

Applicability of General Conformity to the Proposed Action

The Proposed Action would include approval by a federal agency and would be in a federal non-attainment area for PM₁₀, so general conformity applies to the Proposed Action. If a project would result in a total net increase in direct and indirect emissions of non-attainment or maintenance pollutants are less than the applicable *de minimis* thresholds established in 40 CFR 93.153(b), then detailed conformity analyses are not required pursuant to 40 CFR 93.153(c).

The net emissions increase includes evaluating stationary sources, area sources, and mobile sources that result from the federal action and are not covered by another permitting program. Revisions to the General Conformity Rule effective on July 6, 2010, removed the regionally significant emissions test from the applicability determination; therefore, this test was not included in the applicability determination for the Proposed Action.

3.4.1.2 State

California established air pollution control programs before federal requirements were enacted. Responsibility for air quality management programs in California is divided between the ARB, as the primary state air quality management agency, and air pollution control districts, as the primary local air quality management agencies. The ARB oversees air quality policies in California and is responsible for preparing and submitting the SIP to EPA. California established state ambient air quality standards (California Ambient Air Quality Standards [CAAQS]) in 1969. These standards are generally more stringent and include more pollutants than the NAAQS. The California CAA was approved in 1988 and requires each local air district to prepare an air quality plan to achieve compliance with the CAAQS. Similar to EPA, the ARB designates counties in California as attainment or non-attainment with respect to the CAAQS. San Bernardino County, where the Proposed Action would occur, is designated as non-attainment for the state PM₁₀, PM_{2.5}, and O₃ ambient air quality standards.

3.4.1.3 Local

The MDAQMD has local jurisdiction over the portion of San Bernardino County that includes Fort Irwin and primary responsibility for regulating stationary sources of air pollution within its jurisdictional boundaries. The MDAQMD implements air quality programs required by state and federal mandates, enforces rules and regulations based on air pollution laws, and educates business owners and residents about their role in protecting air quality. The MDAQMD air quality plan applicable to the Proposed Action is the *Federal Particulate Matter (PM₁₀) Attainment Plan* (MDAQMD, 1995). In addition, the Proposed Action must comply with the applicable MDAQMD Rules and Regulations. Construction of the Proposed Action would be subject to MDAQMD Rules 403 and 403.2.

3.4.2 Existing Conditions

San Bernardino County, where Fort Irwin is located, is designated non-attainment for PM₁₀ for both federal and state standards. The southern portion of the installation (below the 90 UTM grid line) is designated non-attainment for O₃ for both federal and state standards. The Proposed Action is located north of the federal O₃ non-attainment area; therefore, the project is located in a federal attainment area for O₃.

Air quality at Fort Irwin is influenced by the local climate. The area experiences hot summers, mild winters, infrequent rainfall, and moderate afternoon winds. The average high and low temperatures during the summer at Fort Irwin are 100°F and 70°F, respectively. The average high and low temperatures during the winter are 62°F and 37°F, respectively. Average annual precipitation is approximately 2.5 inches, with most precipitation falling in the winter or during isolated summer thunderstorms.

High particulate matter concentrations in the Mojave Desert are typically the result of wind erosion from exposed or disturbed land areas. Activities at Fort Irwin, such as vehicle travel on unpaved roads and training maneuvers, create fugitive PM₁₀ emissions. Fort Irwin has conducted PM₁₀ monitoring since 1994 and operates eight PM₁₀ monitoring sites within its boundary. Fort Irwin implements standard management practices to reduce particulate emissions, including the following:

- Using water for short-term surface stabilization
- Minimizing tracking of dirt onto paved roads
- Covering haul trucks
- Stabilizing sites with chemicals or vegetation
- Paving parking lots
- Placing gravel to control windblown dust

3.4.3 Climate Change and Greenhouse Gases

This section discusses the existing conditions, regulatory background, and potential greenhouse gas (GHG) emissions from the Proposed Action.

3.4.3.1 Existing Conditions

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind, lasting for an extended period (decades or longer). Climate change may result from any of the following conditions (EPA, 2010):

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun
- Natural processes within the climate system (such as changes in ocean circulation)
- Human activities that change the atmosphere's composition (i.e., burning fossil fuels) and the land surface (i.e., deforestation, reforestation, urbanization, and desertification)

GHGs include the following pollutants (EPA, 2010):

- Carbon dioxide (CO₂) is a naturally occurring gas and a by-product of burning fossil fuels and biomass, land use changes, and other industrial processes. It is the principal anthropogenic GHG that affects the Earth's radiative balance.
- Methane (CH₄) has a global warming potential approximately 20 times that of CO₂. CH₄ is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- Nitrous oxide (N₂O) has a global warming potential approximately 300 times that of CO₂. Major sources of N₂O include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- Hydrofluorocarbons (HFCs) are compounds containing only hydrogen, fluorine, chlorine, and carbon. HFCs have been introduced as a replacement for the chlorofluorocarbons identified as ozone-depleting substances.
- Perfluorocarbons (PFCs) are compounds containing only fluorine and carbon. Similar to HFCs, PFCs have been introduced as a replacement for chlorofluorocarbons. PFCs are used in manufacturing and are emitted as by-products of industrial processes. PFCs are powerful GHGs.
- Sulfur hexafluoride (SF₆) is a colorless gas that is soluble in alcohol and ether and slightly soluble in water. This compound is a very powerful GHG used primarily in electrical transmission and distribution systems, as well as dielectrics in electronics.

3.4.3.2 Regulatory Background

Federal

The EPA Mandatory Reporting Rule became effective on December 29, 2009, and sources required to report were to begin collecting data on January 1, 2010. In general, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of carbon dioxide equivalent (CO₂e) emissions are required to submit annual reports to EPA. The EPA reporting requirements continue to be updated. On November 8, 2010, reporting requirements for petroleum and natural gas systems were finalized.

In addition, the Supreme Court decision in *Massachusetts et al. v. Environmental Protection Agency et al.* (Supreme Court Case 05-1120) found that EPA has the authority to list GHGs as pollutants and to

regulate emissions of GHGs under the CAA. On April 17, 2009, EPA found that CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ may contribute to air pollution and may endanger public health and welfare.

State and Regional

In 2006, the California State Legislature signed the Global Warming Solutions Act of 2006 (AB 32), which provides the framework for regulating GHG emissions in California. This law requires ARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit is 427 million metric tons of CO₂e (ARB, 2007). CO₂ emissions account for approximately 90 percent of the statewide GHG emissions (ARB, 2007). CH₄, N₂O, HFCs, PFCs, and SF₆ emissions account for the remainder of the statewide GHG emissions (ARB, 2007).

The first regulation adopted by ARB pursuant to AB 32 was the regulation requiring reporting of GHG emissions. The regulation requires large industrial sources emitting more than 25,000 metric tons of CO₂ per year to report and verify their GHG emissions from combustion of both fossil fuels and biomass-derived fuels (ARB, 2008).

3.5 Cultural Resources

This section discusses cultural resources in relation to the proposed project area, which is defined as the area of potential effect (APE). The APE includes the construction limits and staging areas. The full cultural survey report is included in Appendix C.

Cultural resources include prehistoric, Native American, and historic properties/materials. Prehistoric resources are physical properties resulting from human activities that predate written records. Prehistoric resources are generally identified as isolated finds or sites and can include village sites, temporary camps, lithic (stone tool) scatters, roasting pits or hearths, milling features, pictographs or petroglyphs (rock art), rock features, and burial sites.

Native American resources are sites, areas, and materials important to Native Americans for religious, spiritual, or traditional reasons. These resources include villages, burial sites, rock art, rock features, or springs. The belief in the sacred character of physical places, such as mountain peaks, springs, or burial sites, is fundamental to Native American religion. Traditional rituals often prescribe the use of particular native plants, animals, or minerals. Thus, activities that might affect sacred areas, their accessibility, or the availability of materials used in traditional practices are of primary concern.

Historic resources consist of physical properties, structures, or built items resulting from human activities that occurred after European settlement. Historic resources can include archaeological remains and architectural structures. Historic archaeological site types include town sites, homesteads, agricultural or ranching features, mining-related features, refuse concentrations, and features or artifacts associated with early military use of the land. Historic architectural resources include houses, cabins, barns, bridges, and lighthouses; local structures such as churches, post offices, and meeting halls; and early military structures such as hangars, administration buildings, barracks, officer quarters, warehouses, and guardhouses.

3.5.1 Regulatory Considerations

Cultural resources are protected primarily through the NHPA (16 U.S.C. Sections 470 through 470x-6) and its implementing regulations (found at 36 CFR Part 800). For a cultural site to be considered significant, the site must meet certain criteria that enable the site to be considered eligible for the National Register of Historic Places (NRHP). Section 106 of the NHPA and its implementing regulations require federal agencies to consider the effect of federal undertakings on historic properties that are listed on or eligible for the NRHP. The Section 106 process includes identifying and evaluating historic properties, assessing the effects of the undertaking on those properties, consulting with the SHPO regarding these effects and any actions that might be taken to address them, and providing the Advisory

Council on Historic Preservation with an opportunity to comment. The following significance criteria are the basis for determining inclusion of a property on the NRHP (36 CFR 60.4):

- Association with events that have made a significant contribution to the broad patterns of our history
- Association with the lives of persons significant to our past
- Resources that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values, or that represent a significant and distinguishable entity whose component might lack individual distinction
- Association with events that have made a significant contribution to the broad patterns of our history
- Association with the lives of persons significant to our past
- Resources that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values, or that represent a significant and distinguishable entity whose component might lack individual distinction
- Resources that have yielded or might be likely to yield information important in prehistory or history

Formerly section 101(d)(6)(B) of the NHPA, amended to chapter 3021 and 2023.01 of title 54, requires the agency official to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. Significance is defined as the importance of a property to the history, architecture, archaeology, engineering, or culture of a community, a State, or the nation (NPS, 1995). Additionally, the act states that:

When Indian tribes and Native Hawaiian organizations attach religious and cultural significance to historic properties off tribal lands, section 101(d)(6)(B) of the act requires Federal agencies to consult with such Indian tribes and Native Hawaiian organizations in the section 106 process. Federal agencies should be aware that frequently historic properties of religious and cultural significance are located on ancestral, aboriginal, or ceded lands of Indian tribes and Native Hawaiian organizations and should consider that when complying with the procedures in this part.

3.5.2 Project Area Conditions

The project is within Fort Irwin, is within an existing RV Park, and is adjacent to a complex of former ammunition storage bunkers. The proposed project area contains paved and dirt roads, utilities and other installation features. The APE is under continuous use and exhibits vehicular disturbance both on established roads and off-road.

An archival review was conducted for the proposed project area and included a search of the South Central Coastal Information Center, a review of historical maps, and consultation with Fort Irwin to review Fort Irwin cultural resource records. The study area of the literature search included the APE, plus a one-mile (1.6-kilometer) buffer around the APE to provide context for known archaeological sites. The literature search showed that portions of the project area had been previously surveyed. Nineteen previously recorded sites and six isolated finds are located within the one-mile study buffer and no cultural resources have been previously recorded within the APE. Of the sites in the study area, all have been evaluated as not eligible (Appendix C of this EA; CH2M, 2016).

The APE was surveyed for cultural resources by visually inspecting the ground surface and subsurface exposures on December 15, 2015, using a survey methodology for prehistoric and historic archaeological resources of pedestrian transects spaced at 10- to 15-meter intervals throughout the APE. One isolated artifact was discovered within the APE as a result of this investigation. Temporary

CH-IF-01 is a single chalcedony flake (Appendix C). Isolates by their definition lack the data potential for eligibility to the NRHP. Therefore, the isolate is not significant and is not a historic property for the purposes of Section 106 (Appendix C; CH2M, 2016).

As a result of the previous uses of the APE, the absence of known historic properties, the recent cultural resource surveys, and results from the pedestrian survey, no further archaeological studies are recommended. As a result of the cultural investigations conducted, a finding of “No Historic Properties Affected,” is recommended in accordance with 36 CFR 800.4(d)(1).

3.6 Noise

3.6.1 Regional Noise Environment

Fort Irwin is located within the 19,600-square-mile restricted area R-2508 Complex, a special-use airspace complex that includes all the airspace and associated land used and managed by Fort Irwin, the United States Air Force Flight Test Center at Edwards Air Force Base, and NAWS China Lake.

The R-2502N and R-2502E areas of the R-2508 Complex consist almost entirely of Fort Irwin. Military operations primarily determine the ambient noise environment within those areas. Military training exercises that contribute to noise at Fort Irwin include army vehicle ground maneuvers, artillery firing, small arms firing, military demolition activities, air operations, air-to-ground weapons firing, and transportation to, from, and within Fort Irwin during and after maneuvers.

Air operations at the Mojave B Range of NAWS China Lake and aircraft stationed at Edwards Air Force Base also contribute to ambient noise in the area. Bicycle Lake Army Airfield is approximately 2.5 miles north of the cantonment area.

3.6.2 Local Environment

Existing noise levels at and adjacent to the proposed site are affected by overhead army aircraft noise and noise levels associated with the cantonment. None of the large- or small-caliber noise zones overlap the proposed expansion site (Michael Baker, Jr. Inc., 2008). The nearest noise zone is a small caliber rifle range approximately one mile northwest of the project area.

Noise levels within the cantonment during normal working hours would be consistent with a noisy urban environment. Vehicular traffic and helicopter traffic are the main contributors to ambient noise levels in the cantonment. Other contributors to ambient noise levels includes military training activities such as army vehicle ground maneuvers, artillery firing, small arms firing, military demolition activities, air operations, and air-to-ground weapons firing. Noise levels would generally be highest during normal business hours, when traffic volume in the cantonment is higher. Vehicle traffic from Fort Irwin and the Outer Loop Roads and military training activities would be the main contributors to ambient noise levels near the project area.

3.6.3 Sensitive Receptors

Sensitive receptors would include those who could perceive an increase in noise and those who would be considered most sensitive to increases in noise. Examples of sensitive receptors would be schools, day care facilities, medical facilities, and residences.

The nearest sensitive receptor to the site are the users of the existing RV Park, which bounds the proposed project location to the north. The Fort Irwin equestrian center is approximately 0.15-mile to the west and northwest. The nearest residential housing is located approximately 0.75-mile east of the proposed RV Park expansion site on North Loop Road.

3.6.4 Noise Policies

Army environmental noise policies are based on land use compatibilities as indicated by objective noise levels. A number of noise measurements are used to assess compatibility, including the following:

- Decibel (dB)—A measurement of the sound pressure level.
- Decibel A-weighted (dBA) (A-weighted sound pressure level)—Sound pressure level, in dB, as measured on a sound level meter using an A-weighting filter network. The A-weighting filter deemphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitive range of the human ear.
- Decibel C-weighted (dBC) (C-weighted sound pressure level)—Sound pressure level, in dB, as measured on a sound level meter using a C-weighting filter network. The C-weighting filter emphasizes the very low frequency components of the sound.
- A-weighted day-night level (ADNL)—Average A-weighted day-night noise level.
- C-weighted day-night level (CDNL)—Average C-weighted day-night noise level.

Noise generated by transportation sources (such as vehicles and aircraft) and from continuous sources (such as generators) is assessed using ADNL. Impulsive noise resulting from armor, artillery, and demolition activities is assessed using CDNL. Noise from small arms ranges is assessed using the peak unweighted sound level. Using these measurement scales, noise limits and associated zones are defined as shown in Table 3-3.

TABLE 3-3
Noise Compatibility Zones
RV Park Expansion Plan EA, Fort Irwin, California

Noise Zone	Population (percent highly annoyed)	Transportation (ADNL)	Impulsive (CDNL)	Small Arms (dB)
I	Less than 15	Less than 65 dBA	Less than 62 dBC	Less than 87 dB
II	15 to 39	65 to 75 dBA	62 to 70 dBC	87 to 104 dB
III	More than 39	More than 75 dBA	More than 70 dBC	More than 104 dB

Source: United States AR 200-1, Chapter 7, Environmental Noise Management Program.

Notes:

ADNL = A-weighted day-night level

CDNL = C-weighted day-night level

dB = decibel

dBA= A-weighted decibel

dBC = C-weighted decibel

Noise-sensitive land uses such as housing, schools, and medical facilities are compatible with the noise environment in Zone I, normally incompatible in Zone II, and incompatible in Zone III.

Noise produced on the installation has minimal effects due to the size and remote location of the installation. The size of the installation allows for the dispersion of noise. The main noise effects within the cantonment are overhead army aircraft noise, large caliber weapon noise, and traffic noise from major arterial roadways, such as Inner Loop Road and Outer Loop Road at Goldstone Road. The number and frequency of military aircraft operating at Fort Irwin are not sufficient to generate noise contours that would normally be used to analyze noise exposure on a Department of Defense installation. Noise levels from rotary-winged aircraft used at Fort Irwin typically range from 92 dBA at a 200-foot altitude to 60 dBA at a 3,000-foot altitude. Fixed-wing aircraft noise levels range from 96 dBA at a 1,000-foot altitude to 55 dBA at a 10,000-foot altitude (Army, 2008).

3.7 Utilities

This section describes existing utilities at Fort Irwin, including water treatment and distribution, wastewater, stormwater, and energy.

3.7.1 Water Treatment and Distribution

Water is extracted through four wells at Bicycle Lake, three wells at Langford Lake, and one well at Irwin Basin (eight wells in total). The well production capacity is estimated at 3.5 mgd with an average daily use for 2015 of 1.9 mgd. The average daily use for 2014 was 1.92 mgd. Two new wells are predicted to come online in the next few months, pending permits from California Division of Drinking Water (DDW) that would bring the total capacity to 5.0 mgd. There are nine storage tanks in operation in the cantonment area, including aboveground and belowground storage tanks (Green, 2015). The water storage tanks provide sufficient water pressure for distribution throughout the cantonment.

The recently completed Fort Irwin water treatment plant (Irwin Water Works) will provide potable water to the RV Park expansion area. The water treatment plant's main treatment process will be electro dialysis reversal. The plant is planned to have a water recovery rate of 99.8 percent and will remove contaminants found in Fort Irwin's groundwater, meeting federal and state water quality requirements. The water treatment plant will have an estimated maximum daily capacity of 6.0 mgd, and would have the capability to expand up to 12.0 mgd to accommodate future demand increases (Fort Irwin, 2011).

3.7.2 Wastewater

The WWTP at Fort Irwin is operated and maintained by a private installation service contractor. The WWTP is permitted to treat 2.0 mgd of wastewater. Recent historical flow data at the Fort Irwin WWTP indicate that the average daily flow is 0.98 mgd and the maximum average flow is 1.31 mgd. While the plant is permitted to treat 2.0 mgd of wastewater, the permit requires Fort Irwin to plan for a second oxidation ditch if the inflow exceeds 1.5 mgd, which is 75 percent of the permitted capacity, for 30 consecutive days. The sanitary sewer collection system provides adequate service. The outfall line has sufficient capacity to allow for an average flow rate of 3.0 mgd, based on a 2.5 peaking factor. Considering the average flow rate of the outfall line, the collection system can support an effective population of almost 43,000.

Fort Irwin has a tertiary treatment plant that treats wastewater effluent from the Fort Irwin WWTP to required standards to be used as recycled water. Fort Irwin has a separate distribution system for recycled water, which is used for irrigation of green space and dust suppression. Fort Irwin plans to expand the recycled water system to increase the use of recycled water and reduce the amount of treated groundwater used for irrigation and other non-potable uses.

3.7.3 Stormwater

Stormwater originating from the mountainous regions surrounding the cantonment area flows directly toward the developed areas of the installation. Stormwater controls around the cantonment, mainly consisting of stormwater channels and levies, direct stormwater around the cantonment and to the south. Streets and curbs control stormwater drainage in most of the heavily developed cantonment area.

There are two natural drainages to the north and south of the project area where most rainfall/runoff is concentrated. Both drainages convey flow to the east towards the cantonment stormwater controls.

3.7.4 Energy

This section discusses energy use at Fort Irwin, including liquid petroleum gas, heating and cooling systems, and electricity.

3.7.4.1 Liquid Petroleum Gas

Fort Irwin uses liquid petroleum gas as its energy source for space heating and hot water heating. The fuel is conveyed by truck to the installation and stored in tanks at two locations.

3.7.4.2 Electricity

Southern California Edison owns the electrical system at Fort Irwin and is the responsible entity to ensure that adequate electrical capacity and service are available for existing and future needs at Fort Irwin. The Tiefert Substation serves the cantonment at Fort Irwin. The substation houses two 28-megavolt ampere transformers for a total capacity of 56 megavolt amperes. The substation is a 115-kilovolt (kV) substation that steps down to 33 kV and feeds two distribution substations in the interior of the installation, the Military Substation and Irwin Substation. The average daily monthly demand for FY 2006 was 8,519 megawatts per hour (MWh) with peak demands up to 12,900 MWh during the summer months (Fort Irwin, 2008).

3.7.5 Solid Waste Management

Solid waste is collected and transported to the landfill on the installation by standard compacting garbage trucks. On designated collection days, the base operations contractor collects waste from the garbage and recycling containers in the family housing areas. Most other facilities on the installation use large trash receptacles segregated for garbage disposal and recycling.

The Fort Irwin base operations contractor is responsible for collecting recyclable materials throughout the installation. Recyclable materials include mixed office paper, aluminum beverage cans, tin and bimetal food and beverage containers, corrugated cardboard, plastic containers, glass bottles and jars, and newspapers.

The sanitary landfill at Fort Irwin is a Class III permitted facility located approximately one mile east of the cantonment area. Landfill operations at Fort Irwin started in the 1970s, and the landfill was expanded in 1981 from 160 acres to 467 acres. The active sanitary landfill is 18 acres, and the remaining landfill is subdivided into seven 25-acre disposal areas. Each cell is excavated to a depth of 25 feet below ground surface and would have a height of 60 feet above the existing grade. This portion of the landfill expansion area has a liner, a leachate collection system, and a baler facility. The total landfill capacity is estimated at 19 million cubic yards. Assuming the waste is baled and the annual fill rate remains at 36,000 cubic yards, the remaining landfill life would be approximately 265 years. The solid waste generation rate of 36,000 cubic yards per year is equivalent to an average of 99 cubic yards per day.

The sanitary landfill is permitted to receive non-liquid, non-hazardous waste. The facility does not accept hazardous materials, hazardous waste, ammunition, oil-contaminated products, petroleum, oil, lubricant-contaminated soil, batteries, friable asbestos, biological waste, polychlorinated biphenyls, toxic chemicals, or lithium/magnesium batteries. Employees at the landfill entrance inspect all deliveries to ensure that only acceptable materials are disposed of at the landfill.

3.8 Hazardous Materials

The project location is not within an area managed under the Installation Restoration Program (IRP). Small quantities of potentially hazardous material (e.g., cleaning materials and solvents) likely are used by patrons of the RV Park. Based on previous investigations, no munitions or explosives of concern (MEC) are known from the project area.

3.9 Health and Safety

Valley fever (*Coccidioides immitis*) is known to occur in the Mojave Desert. Valley fever or *coccidioidomycosis* is a fungal infection that occurs in the southwestern states. The fungus occurs in soil and can be acquired by inhaling dust particles that contain the fungus. A study conducted at Fort Irwin found that the risk of a serious infection was low for military personnel training in the desert; however, the incidence of infection may vary depending on activities and geographic factors (Crum et al., 2004). There were 75 cases of valley fever in San Bernardino County in 2011, an incidence rate of 3.4 cases per 100,000 people (San Bernardino County, 2015).

Unexploded ordnance (UXO) is a health and safety hazard to those working or training on Fort Irwin. However, the project area has not been known to be used as a range and UXO is not known to occur in the project area. Fort Irwin implements a training program for those working or training in areas with potential for UXO, including construction contractors.

3.10 Aesthetics

Aesthetics refers to the beauty in both form and appearance of visual resources, including natural and built components of the environment perceived by humans. Perceptions of what is beautiful or appealing vary between individuals based on personal preferences.

The proposed project area is located just outside the cantonment and is adjacent to the heavily developed portions of the installation. The project area is located between the existing overcrowded RV lot and an abandoned series of earthen ammunition bunkers. The project area mostly consists of degraded desert scrub habitat. There is a high degree of human activity, including foot traffic from occupants of the existing RV Park. Regular vehicle traffic on Goldstone Road and overhead military flights occur within and adjacent to the project area. The mountains surrounding the cantonment is a prominent feature in the landscape.

3.11 Transportation

3.11.1 Local Transportation Roads and Conditions

The local transportation system at Fort Irwin consists of roadways, pedestrian walkways, and bicycle paths and is used for normal, on-post traffic demands for everyday working, living, or recreational trips. In addition, personnel living off-post commute daily to and from work, and retired military and family members use the service facilities at the installation. The existing cantonment roadway network adequately serves the transportation needs of the roughly 15,000 people living and working on the installation.

Due to its location, Fort Irwin has limited public transportation. The Fort Irwin express bus provides service between Barstow and Fort Irwin five times in the morning between 4:20 a.m. and 8:00 a.m., with five return routes between 3:45 p.m. and 6:00 p.m. Two additional early morning routes to Fort Irwin originate in the Victorville area, returning in the afternoon.

3.11.2 Regional Roads and Conditions

Fort Irwin Road provides public and military access to Fort Irwin from Interstate 15 (I-15), northeast of Barstow. Fort Irwin Road is a two-lane defense access road (DAR). The U.S. Department of Transportation Federal Highway Administration administers the Federal Lands Highway Program, which surveys, designs, and constructs DARs and other roads for federal lands. The Federal Lands Highway Program was established for the military to fund the cost of public highway improvements necessary to mitigate effects of defense activity. Fort Irwin Road is a paved, San Bernardino County-maintained road that provides one lane in each direction with numerous sections containing passing lanes. Through the Federal Lands Highway Program, San Bernardino County and the Army have funded rehabilitation and other improvements on Fort Irwin Road (Army, 2008). Safety improvements along Fort Irwin Road were completed in November of 2006 (*Desert Dispatch*, 2007).

Fort Irwin Road can be accessed by Irwin Road, which extends from Barstow, along I-15, northeast to Fort Irwin Road. Irwin Road has two lanes, one in each direction, and is maintained by San Bernardino County.

According to a study conducted in 2000, the average daily traffic for Fort Irwin Road was 5,182 vehicles. In 2014, the average daily traffic on Fort Irwin Road, east of Irwin Road, was 5,827 (San Bernardino County, 2014). Between October 1989 and September 1999 there were 178 crashes, in which 153 persons were injured and 13 persons were killed on Fort Irwin Road. From 2002 to 2005, 11 fatalities on

Fort Irwin Road were reported (Army, 2008). In FY 2006, five fatalities were reported. Since road improvements were finalized in November 2006, traffic conditions have improved. No fatalities were reported along Fort Irwin Road during FY 2007 (*Desert Dispatch*, 2007).

3.11.3 Traffic Flow and Safety at Fort Irwin and the Cantonment Area

A Fort Irwin traffic analysis found that major intersections are congested during morning and evening commutes and lunchtime, but upgrades were not warranted. An average of 102 accidents occurred per year on Fort Irwin from 2004 to 2008, but the locations of these accidents have not been recorded (Michael Baker, Jr., Inc., 2009). Recommendations in the traffic analysis included minor upgrades, such as installing yield signs or closing unused curb cuts that appear as driveways. By 2028, more substantial upgrades, such as traffic signals and turn lanes, were anticipated to be required. The existing 100 miles of paved roadways and 45 miles of graded roadways within the cantonment area serve the current needs and mission of the installation.

Fort Irwin generates all but a small amount of the traffic using Fort Irwin Road. The remainder of the traffic comes from ranches, mines, and homes in the area. With the recent growth of Fort Irwin, the amount of congestion on this two-lane highway has increased steadily. The highway experiences heavy traffic use (especially during the morning and evening peak hours), and safety problems exist. Dangerous conditions develop because heavy transport vehicles and privately owned automobiles share this road.

With the exception of some congestion at the center of the installation during the morning, noontime, and evening rush hours, the Fort Irwin roadways appear to operate within their design capacities.

Community support facilities and concentrated housing areas are located along Goldstone Road, and these contribute to the higher amounts of traffic. Barstow Road is one of the main thoroughfares through the center of the cantonment and is the main access to many of the offices, dormitories, and light industrial areas that support the Fort Irwin mission. Traffic within the cantonment also highly depends on rotations when units come to Fort Irwin to train and traffic can increase significantly during those rotations. However, all roads on Fort Irwin are considered sufficient to handle current and anticipated traffic loads (Michael Baker, Jr., Inc., 2009).

3.11.4 Aircraft Facilities

Fort Irwin is served by one on-post airfield—the Bicycle Lake Army Airfield. The main Fort Irwin helipad is located near the Weed Army Community Hospital. Various other helicopter and airstrip facilities are used in support of training areas. Bicycle Lake Army Airfield is on a dry lakebed 2.5 miles north of the cantonment area.

3.12 Recreation

Fort Irwin offers a variety of recreational opportunities within the cantonment area, which are limited to the general public. Recreational facilities include: two multipurpose athletic fields, five softball fields, two baseball fields, miniature golf, bowling center, skateboard park, batting cage, outdoor bandstand, handball court, two gyms, indoor hockey rink, outdoor swimming pool, driving range, pedestrian Jack Rabbit Park, automobile repair shop, multimedia arts and crafts shop, and an equestrian club. On the east side of the installation, there is a community recreation area used by Boy Scouts and horse riders. A skeet and trap range, paintball field, rod and gun club skeet area, and equestrian area are located just to the west of the cantonment (Army, 2008).

The High Desert Equestrian Club operates a 32-stall facility off of Goldstone Road, which is approximately 0.2-mile west of the proposed project site. The equestrian club is open to all members of the Fort Irwin community. No offices or staff are present at the location and horses occupying the stalls are privately owned. Horseback riding is allowed only in areas designated by Range Control (Army, 2006).

The existing RV Park bounds the proposed project area to the north. The RV Park has capacity for 50 RV units and is often overcrowded with double parked RVs in many of the spaces. The Sportsman Club is located approximately one mile northwest of the Proposed Action location off of Goldstone Road. The club consists of rifle, pistol, and archery ranges for use by military, civilians, dependents, support personnel and visitors.

Hunting is permitted within the installation boundary from late October until February and is regulated by the California Department of Fish and Game and additional Fort Irwin regulations. Hunting of quail, chukar, cottontail rabbits, mourning doves, and coyotes is limited to installation personnel. Hunters must have a California State license to hunt and coordinate their hunting activities with three offices on the installation: Outdoor Recreation, Provost Marshall, and Range Control. The proposed project site is not used for hunting due to its proximity to the existing RV Park, the High Desert Equestrian Club, and cantonment.

SECTION 4

Environmental Consequences

This section assesses the environmental consequences associated with the Proposed Action and the No Action Alternative. Direct, indirect, and cumulative environmental effects are described for each resource. These effects are defined as follows:

- Direct effects are caused by the action and occur at the same time and place (40 CFR Section 1508.8).
- Indirect effects are caused by the action and occur later in time or farther removed in distance but are still reasonably foreseeable (40 CFR Section 1508.8).
- Cumulative effects are those that result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR Section 1508.7).

Effects were analyzed for each of the resources identified in the previous section as potentially affected by implementation of the Proposed Action. Resources that would not be affected include land use; geology, seismicity, and mineral resources; hazardous material; and environmental justice and protection of children. These resource areas are not discussed further in this section.

4.1 Soils

This section addresses the suitability of the proposed and potential sites for project construction and operation based on soils.

Soil resource effects are considered significant if:

- Soils are disturbed and subjected to erosive forces that cannot be mitigated
- Soil erosion extends to offsite areas and degrades soils in offsite areas

4.1.1 Proposed Action

4.1.1.1 Construction Phase

No important soil resources are present in the Proposed Action area. Soils at the proposed RV Park expansion site are disturbed and are sparsely vegetated. Expansion of the RV Park and the associated construction of a comfort station would disturb soils and permanently alter the condition of the soils. Portions of the site would have paved surfaces for parking pads and a building foundation, which would inhibit soil exposure and change the soil infiltration capabilities.

Construction activities could temporarily increase soil erosion, especially wind erosion. Fine particulate matter found on the desert surface could become airborne and create adverse dust conditions. Heavy equipment would be used to grade the site, move and compact soils, and remove debris during construction and paving activities. The impacts would be temporary and could be reduced by using standard best management practices (BMPs) such as dust suppression techniques that could include spraying the ground with water and/or soil binders. Fort Irwin implements dust abatement programs that address problems associated with wind erosion and suspension of particles, including chemical stabilization and revegetation (Army, 2006). Additionally, the requirements set forth in Rule 403.2, Fugitive Dust Control for the Mojave Desert Planning Area (MDPA), would be adhered to (MDAQMD, 1995). Implementation of current practices and standard construction BMPs to reduce erosion and airborne dust would minimize negative impacts to soils during construction. Therefore, less than significant impacts would occur as a result of the Proposed Action.

Erosion of soils due to stormwater would be reduced by implementing BMPs for prevention of runoff (see Section 4.3, *Water Resources*). Implementation of standard engineering design and construction practices would minimize negative impacts to soils during construction. Therefore, no significant adverse impacts to soils would occur as a result of the Proposed Action.

4.1.1.2 Operation and Maintenance Phase

Operation and maintenance (O&M) of the new RV Park would not result in an adverse long-term impact to site soils because standard erosion control practices implemented by Fort Irwin would continue. If needed, the grounds surrounding the RV Park would be xeriscaped and post-construction stormwater BMPs would be designed and implemented to reduce long-term impacts from stormwater runoff.

4.1.2 No Action Alternative

Under the No Action Alternative, the RV Park expansion would not be constructed and there would be no impact to soils in the Proposed Action area.

4.1.3 Cumulative Impacts

There could be cumulative effects on soils. Multiple construction projects could occur on Fort Irwin simultaneously and could include current and planned construction for wastewater, water, and stormwater infrastructure improvements in the cantonment; construction related to an Energy Savings Performance Contract at the Fort Irwin landfill; construction of a new Unmanned Aircraft Systems hanger and maintenance facility; construction of a Multi-Purpose Range Complex; and, construction of an approximately 250-acre solar facility. If multiple construction projects were to occur at one time, windborne soil erosion issues due to construction activities could create a nuisance; however, dust suppression BMPs would be implemented on all Fort Irwin construction activities, and not all construction projects are expected to occur simultaneously. Soil effects from the Proposed Action would be short-term and would not contribute to any long-term cumulative effects.

4.1.4 Project Design Measures

Although no significant adverse impacts to soils are anticipated, a number of measures would be implemented to reduce potential adverse impacts. To protect the soil at the proposed project site during construction, erosion and sediment control measures and other BMPs would be implemented. In addition, a stormwater pollution prevention plan (SWPPP) would be prepared, which would ensure that appropriate measures are taken to minimize soil erosion and protect the surrounding soils.

Erosion control measures that could be used during construction to protect exposed soil and minimize erosion include compost blankets, mulching, riprap, watering, soil-binding agents, seeding and sodding, geotextiles, and slope drains.

Sediment control measures could include compost filter berms and socks; fiber rolls or berms; temporary sediment basins, rock dams, filters, chambers, or traps; silt fences; storm drain inlet protection; and hay bales.

All BMPs and erosion control measures would meet the requirements of the Fort Irwin dust abatement programs and the requirements set forth in Rule 403.2, Fugitive Dust Control for the MDPA (MDAQMD, 1995).

4.2 Biological Resources

Potential impacts to biological resources related to implementation of the Proposed Action would be associated with ground disturbance during expansion of the RV Park.

Impacts to biological resources are considered significant if one or more of the following criteria are met with the implementation of the Proposed Action:

- Any loss of individuals or populations of a federally listed or proposed endangered or threatened species or its habitat
- Any loss of critical habitat and/or declining wildlife habitat that is sensitive or rare to the project region (such as wetlands, stabilized and partially stabilized desert sand fields, and stabilized and partially stabilized desert dunes)
- Any fill or alteration of wetland or Waters of the United States regulated under the CWA and/or California Fish and Game Code
- Substantial loss of populations or habitat of a federal Species of Concern, California Species of Special Concern, or otherwise regionally rare or sensitive species that could jeopardize the continued existence of that species in the project region
- Substantial loss or long-term disruption of a major wildlife movement corridor
- Loss of at least 5 percent of undisturbed habitats within a biogeographic region, such as that found in a single valley or mountain range.
- Substantial loss of natural vegetation communities that are slow to recover
- Substantial loss of native plant or animal species or community diversity

4.2.1 Proposed Action

4.2.1.1 Construction Phase

Flora

Approximately 15 acres of creosote bush-white bursage series vegetative community type habitat would be permanently lost as a result of the Proposed Action. The effect on biological resources would be minimal because substantial additional similar habitat occurs in the vicinity and throughout the Fort Irwin area, including expansive areas that are less disturbed. There would be less than significant impacts on vegetation communities from the permanent loss of 15 acres of habitat as a result of the Proposed Action. The vegetation within the project area is previously disturbed and vegetation loss of 15 acres would be well below five percent of the habitat within the biographic region.

Special Status Species

Federally or State-listed Species

No federally or state-listed plant species were observed during the field surveys. The Lane Mountain milk-vetch would not be anticipated to be present because the species generally occurs at higher elevations and on less disturbed sites than those at the proposed site or vicinity. As such, no impacts to listed plant species would be anticipated from implementation of the Proposed Action.

Other Special Status Species

No special-status plant species were observed during the survey of the project area. Due to the lack of habitat, degraded condition of habitat within the project area, and/or recurring human disturbance it would be unlikely that the alkali mariposa lily, Clokey's cryptantha, small-flowered androstephium, Barstow wooly sunflower, or Mojave monkeyflower would occur in the project area. Therefore, no impact to special-status plant species would be expected.

Fauna

The permanent loss of 15 acres of creosote bush-white bursage series vegetative community type habitat would not be expected to have a substantial adverse effect on general wildlife species because ample areas of undisturbed similar habitat are present in the vicinity of the Proposed Action. Direct mortality of common wildlife could occur during construction; however, common wildlife would likely

relocate to adjacent habitat during construction. Extensive areas of similar habitat are present adjacent to and throughout Fort Irwin and would be expected to continue to support these general wildlife populations. Construction, including land clearing activities, would not commence during the nesting season to the extent practicable, which is from February 15 to August 31 in the Fort Irwin area, to avoid impacts to MBTA species. The project area is not designated as critical habitat and does not provide any habitats that are considered sensitive or rare in the region. The project area does not function as a major wildlife corridor. Minor impacts to common wildlife would be anticipated as a result of the loss of habitat resulting from the Proposed Action.

Federally or State-listed Species

Desert Tortoise. The degraded habitat within the project area provides marginally suitable habitat for desert tortoise. No recent signs of desert tortoise were identified within the project area during the field survey. The Fort Irwin Integrated Natural Resources Management Plan (INRMP) provides a management strategy for the desert tortoise to conserve and monitor populations, conserve habitat, educate the public, and minimize impacts to the species with an adaptive ecosystem management approach.

Fort Irwin has determined that construction of the Proposed Action may affect, but is not likely to adversely affect the desert tortoise. No consultation with USFWS would be needed because the Proposed Action would be covered under the *Biological Opinion for Operations and Activities at Fort Irwin* (2014 BO; USFWS, 2014). Any actions involving desert tortoise would be conducted consistent with the 2014 BO for operations and activities at Fort Irwin (USFWS, 2014). Fort Irwin would comply with the mandatory and discretionary actions for conservation of desert tortoise identified in the 2014 BO, which are identified in Section 4.2.4 to avoid or minimize potential impacts. Impacts to desert tortoise as a result of clearing up to 15 acres of habitat would be minor and temporary with implementation of project mitigation.

There is ample similar habitat adjacent to the project area and throughout Fort Irwin available for potential relocation of desert tortoise found within the project area during preconstruction surveys or construction, if needed. Desert tortoises could be relocated to other areas with fewer disturbances, including established conservation areas on Fort Irwin, and away from military training areas that can include off-road maneuvers. Relocation of desert tortoise, if necessary, would be completed in accordance with the 2014 BO and established Fort Irwin protocols.

Mohave Ground Squirrel. This species was not observed during field surveys and is not known to occur on or near the project area according to the Fort Irwin Mohave ground squirrel sightings database (Fort Irwin, 2016e). Two five-day camera trapping surveys were conducted from March 21 through 25, 2016 and April 4 through 9, 2016. An additional five-day Mohave ground squirrel/incidental wildlife camera survey was conducted by the Fort Irwin Environmental Division from June 2 through 7, 2016. The camera surveys primarily captured wildlife species typically occurring in an urban, desert creosote-scrub habitat type. The Mohave ground squirrel was not observed during the natural resource survey or detected during the camera trapping surveys (Fort Irwin, 2016a; Fort Irwin, 2016b). The Mohave ground squirrel habitat within the project area is considered low-quality given the vegetation present and the fact that the area of suitable habitat is relatively small, isolated, and impacted by continual human disturbance (Fort Irwin, 2016a). No significant effect to this species would be expected and implementing a number of project design measures that are detailed in Section 4.2.4 as part of the Proposed Action would further reduce the potential effects to negligible.

Burrowing Owl. The project area provides only marginally suitable habitat for the burrowing owl. It is likely that burrowing owl would mainly use the project area for foraging, and would avoid the area during construction. There is ample similar foraging habitat adjacent to the project area and throughout Fort Irwin. To the extent practicable, land clearing activities would not begin during the nesting season, which is from February 15 to August 31 in the Fort Irwin area, to avoid impacts to burrowing owl. If vegetation clearing is required during the breeding season, preconstruction surveys for burrowing owl

would be conducted. Identified active burrows would be protected from disturbance by a 500-foot no disturbance buffer, which would remain in place until the young fledge and no new burrows are initiated for the season. Impacts to burrowing owl would be negligible with the use of mitigation.

Yellow-headed Blackbird. The yellow-headed blackbird was not observed on the site during the survey. It has been observed on Fort Irwin less than five miles from the site. No significant effect to this species would be expected and implementing a number of project design measures that are detailed in Section 4.2.4 as part of the Proposed Action would further reduce the potential effects to negligible.

Mojave fringe-toed lizard. There is no suitable habitat for the Mojave fringe-toed lizard in the project area. This species would not be expected to occur in the project area. Therefore, no impacts would be expected.

Other Special-status Species

The project area does not provide habitat suitable for other special-status species. The Bendire's thrasher, Crissal thrasher, LeConte's thrasher, and loggerhead shrike would not likely occur within the project area due to the degraded habitat and degree of human activity. However, the habitat could be suitable for foraging. Wildlife species would likely avoid the project area during construction, but there is ample similar habitat adjacent to the project area. It is highly unlikely that the golden eagle, northern harrier, and Vaux's swift or wintering ferruginous hawks would occur within the project area.

While no significant effects on these species would be expected, implementing a number of project design measures that are detailed in Section 4.2.4 as part of the Proposed Action would further reduce the potential effects to negligible. By implementing these measures, the Proposed Action would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by USFWS.

Potential Effects from Pest Species

Construction activity could attract ravens, considered a pest species in the area, to the Proposed Action site. This would be temporary, and ravens would likely disperse when construction is complete. Good housekeeping during construction and operation would minimize the potential for the raven to occur onsite. All trash and debris would be placed in receptacles for delivery to approved landfill facilities. Site cleanup of trash and debris would be required on a daily basis, including emptying and disposing of trash receptacles.

4.2.1.2 Operation and Maintenance Phase

Flora

No additional vegetation removal would be expected during O&M of the expanded RV Park. O&M activities would occur in previously disturbed and cleared areas. Therefore, no impacts would occur to common or special-status flora during O&M of the expanded RV Park.

Fauna

Common and special-status wildlife may return to the Proposed Action area upon completion of construction for foraging or stopovers during migration periods. Expansive foraging habitats are available nearby for these species, and no long-term impacts would be anticipated from implementation of the Proposed Action. The permanent loss of low quality, highly disturbed Mojave creosote bush scrub is not expected to interfere with the movement of any native resident or migratory bird or wildlife species, or with established native resident or migratory wildlife corridors. The proposed site is surrounded by development. Ample undisturbed creosote bush scrub habitat is present in the vicinity of the Proposed Action site.

To further reduce the potential to impact desert tortoise, burrowing owl, kit fox, and other special-status species previously mentioned, measures similar to those mentioned for construction impacts would be implemented for maintenance activities.

No consultation with USFWS would be needed for maintenance activities because they would be covered by the 2014 BO. Maintenance activities would be conducted in accordance with the 2014 BO. Preconstruction surveys would be completed in work areas and along potential access routes prior to initiation of maintenance activities. Measures to avoid or further minimize impacts to special-status species are identified in Section 4.2.4. Impacts to special-status species resulting from periodic maintenance activities would be temporary and negligible with implementation of mitigation measures.

4.2.1.3 Potential Effects from Pest Species

Development in the cantonment area would attract pest species. Pest species, including ravens and coyotes, would be managed using good housekeeping and proper waste management practices as discussed in Section 4.2.6. No significant impacts would occur.

4.2.2 No Action Alternative

Flora

Under the No Action Alternative, the RV Park expansion would not occur and there would be no impact to plant species, including special status species, or plant communities in the Proposed Action area.

Fauna

Under the No Action Alternative, the RV Park expansion would not occur and there would be no impact to fauna, including special-status species or pest species in the Proposed Action area.

4.2.3 Cumulative Impacts

Development occurs regularly on Fort Irwin, resulting in reductions in the amount of creosote bush habitat. Because the creosote bush habitat in the Proposed Action site is disturbed and because ample intact similar habitat is available in the region outside of the Proposed Action area, any contribution to cumulative effects from the loss of desert scrub habitat at the proposed site would be insignificant. Strict guidelines and management practices for the conservation and recovery of threatened and endangered species and their habitat on Fort Irwin are implemented and no cumulative impacts to special-status species would be anticipated.

4.2.4 Project Design Measures

Desert Tortoise. To avoid potential effects to this federally listed species, the following measures would be implemented during construction and maintenance of the Proposed Action to the extent practicable and would be consistent with USFWS guidelines and the 2014 BO:

- Before construction begins, personnel working on the site would receive a briefing on the desert tortoise, detailing the life history of a tortoise and the protocol to follow if a tortoise is encountered in the project area. An authorized biologist would conduct the briefing.
- Desert tortoise exclusion fencing would be placed at staging and parking areas. Desert tortoise guards would be placed at entrances to the staging and parking areas. Fence installation would be overseen by an authorized biologist.
- A preconstruction survey by an authorized biologist would be conducted in areas where desert tortoise exclusion fencing would be placed. The survey would occur prior to fence installation. If an active burrow or desert tortoise are identified during the survey appropriate measures as identified in the 2014 BO to avoid effects would be implemented.
- During land clearing and construction, a biological monitor would be available to observe construction activities and to verify that no tortoises wander into the construction area. If an active

burrow or desert tortoise are identified during the survey appropriate measures as identified in the 2014 BO to avoid effects would be implemented.

- Desert tortoise burrows located within 100 feet of the limits of construction would be marked and protected by conducting additional briefings on their location to insure avoidance. Desert tortoise burrows that cannot be avoided would be excavated by hand either by an authorized biologist or under his or her direct supervision. Burrow excavation and subsequent handling of any desert tortoise would follow the most up-to-date guidelines that are acceptable to USFWS.
- Workers will be required to inspect the underside of all onsite parked vehicles before moving them (unless parked in staging or parking area protected by exclusion fencing). If a desert tortoise is detected, then an authorized biologist will remove the animal to a safe place or wait until the animal moves to safety on its own.
- Speed limits in and around the project area will be enforced throughout construction and maintenance activities. Vehicles shall not exceed 15 miles per hour (mph) on unpaved roads and the right-of-way accessing the construction sites or 10 mph during the night.
- To the extent possible, construction activities involving vegetation clearing and/or ground disturbances will be scheduled when tortoises are inactive (November 1 to March 15).
- Channels and basins would be designed so that desert tortoise can pass through these features unimpeded and so that desert tortoise would not be constrained in these features.
- All trenches and excavations would be filled or covered at the end of each work day. If left uncovered the exposed pipe in the excavation would be capped and a temporary tortoise fence would be placed around the excavation. Any excavation left open while not attended would be inspected prior to initiation of work to ensure that no desert tortoise wandered into the excavation.

Other Special-status Species

Bendire's thrasher, burrowing owl, Crissal thrasher, Le Conte's thrasher, and loggerhead shrike are unlikely to breed within the project area and it is unlikely that there is a kit fox burrow in the project area. To avoid potential effects on nesting birds, including birds protected under the MBTA, burrowing owl, and kit fox, if observed, the following measures would be implemented during construction and maintenance activities as part of the Proposed Action:

- Land and vegetation clearing would occur outside the breeding season for birds listed under the MBTA, defined as February 15 to August 31, where practicable. No land or vegetation clearing that would affect habitat for special-status species would be expected.
- If vegetation clearing is required during the breeding and nesting season, preconstruction surveys of breeding birds, including burrowing owl, would be conducted. Identified active nests or burrows would be protected from disturbance by a 500-foot nesting buffer, which would remain in place until the young have fledged from the nest or burrow and no new nests or burrows are initiated for the season.
- If a kit fox burrow is identified on or adjacent to the project area during the preconstruction survey, Fort Irwin natural resources staff will be contacted. Fort Irwin staff would determine the status of the burrow and establish an exclusion zone if necessary. Fort Irwin would decide if fencing or flagging would suffice to delineate the exclusion zone.

Pest Species

Construction and maintenance activities might attract additional pest species, including ravens, coyotes, and burros where additional food or trash is available. Good housekeeping practices at the nearby

equestrian center with horse food resources could help lower the amount of burro traffic in the area. To avoid potential adverse effects, the following measures would be implemented at the project area:

- During construction and maintenance activities, all trash and debris would be placed in covered receptacles for delivery to approved landfill facilities.
- Daily cleanup of trash and debris would be required, including emptying and disposing of trash in receptacles.

4.3 Water Resources

This section addresses potential effects on surface water and groundwater resources during construction and operation of the Proposed Action. Effects on water resources are considered significant if any of the following conditions are met:

- Groundwater levels are reduced to such an extent that spring flows are diminished or production at existing wells within the basin or adjacent interconnected basins falls below economically feasible or practical engineering limits
- Groundwater quality changes occur because of increasing salinity or mineral content that can negate the water's value for domestic, industrial, or agricultural consumption
- Existing surface water drainage patterns are altered
- The quality of ephemeral water resources available for wildlife at dry lakes, spring flows, or linear riparian systems with ephemeral flows is degraded
- Increases in water quality constituents could lead to a violation of specific state and federal standards

4.3.1 Proposed Action

4.3.1.1 Construction Phase

Surface Water, Including Jurisdictional Waters

There are no wetlands, springs, or drainages located within or adjacent to the Proposed Action area. Impacts to nearby drainages that could receive stormwater from the Proposed Action site would be reduced by the use of construction BMPs that reduce erosion and sedimentation. Impacts to nearby surface water with potential to receive stormwater runoff from the site would be minimized during construction by implementing a SWPPP with appropriate BMPs for stormwater, which are summarized in Section 4.3.4. Stormwater would be managed by a series of BMPs during construction. There would be negligible adverse impacts to surface waters due to construction of the Proposed Action.

No wetlands or other jurisdictional waters occur on or adjacent to the proposed RV Park expansion site. Therefore, there would be no direct impacts to jurisdictional waters from expansion of the RV Park. The potential for indirect impacts to jurisdictional waters located outside the Proposed Action area from erosion, runoff, and sedimentation would be minimized by implementation of appropriate BMPs for stormwater control. BMPs that could be implemented include, but are not limited to, using infiltration or detention areas during construction to prevent scour from stormwater runoff, installing and maintaining silt fencing around disturbed soils, and mulching disturbed soils to reduce the impact energy of precipitation.

Groundwater

The desert location of Fort Irwin and the scarcity of water resources make water conservation and resource management critical. In order to conserve water resources on Fort Irwin, recycled water would be used for dust suppression during construction and maintenance activities instead of treated groundwater. Recycled water at Fort Irwin is typically used for irrigation of green spaces and for dust suppression. Recycled water not used for these purposes is disposed of via percolation ponds near the Fort Irwin WWTP where the water either percolates to the groundwater or evaporates.

4.3.1.2 Operation and Maintenance Phase

Surface Water, Including Jurisdictional Waters

There are no surface waters on the Proposed Action site; however, offsite surface waters that could receive stormwater runoff from the site could be impacted by the increase in runoff due to increased impervious area. Post-construction BMPs would be implemented to meet current stormwater regulations and handle the additional surface runoff due to the increase in impervious area. Therefore, adverse impacts on surface water resources or stormwater runoff would not be anticipated.

Groundwater

Operation of the expanded RV Park would require water to supply additional RV spaces. Visitors of the RV Park would use water from the site connections or water at the comfort station for daily activities. With the addition of 59 RV stations with water and sewer connections and an estimated two people occupying each RV, at year-round capacity, water consumption for the expanded RV Park could increase by approximately 5,900 gallons per day (gpd) or 0.0059 mgd. Given the current average daily use of water at Fort Irwin (1.92 mgd), there would be an increase of 0.003 percent of water usage at Fort Irwin, which is well within the capacity of the Irwin Water Works. There would be a negligible impact from an increase in water usage resulting from the Proposed Action.

4.3.2 No Action Alternative

Under the No Action Alternative, there would be no change from existing conditions.

4.3.3 Cumulative Impacts

The Proposed Action would result in less than significant impacts to surface waters. Therefore, significant cumulative impacts would not be expected. Other ongoing or planned construction on Fort Irwin would utilize BMPs to reduce impacts on surface waters. Cumulative effects on groundwater from new construction and increases in the Fort Irwin population could occur. However, a new, more efficient water treatment plant (Irwin Water Works) was recently completed at Fort Irwin and is capable of recycling more wastewater, and thereby further reducing demand on groundwater resources. Ongoing and planned construction on Fort Irwin would utilize recycled water for dust suppression. With recent improvements to water treatment and proposed water recycling projects, and because the Proposed Action would increase the average daily consumption by such a small amount, cumulative effects on groundwater due to the Proposed Action are not expected.

4.3.4 Project Design Measures

4.3.4.1 Surface Water

Potential surface water effects would be minimized during construction and maintenance activities by implementing appropriate BMPs for stormwater. Proper BMPs would be implemented prior to the start of land grading or trenching activities. Native vegetation would be preserved when possible. Erosion, runoff, and sediment control measures would be implemented in case of a stormwater event. Construction would not occur in drainages during rain events or if rain is expected. Erosion control measures such as compost blankets, mulching, riprap, geotextiles, and slope drains could be used to protect exposed soil and minimize erosion. BMPs, such as check dams, slope diversions, and temporary

diversion dikes could be implemented for runoff control. Sediment control measures that could be implemented include compost filter berms and socks; fiber rolls or berms; sediment basins, rock dams, filters, chambers, or traps; silt fences; and weed-free hay bales. Staked fiber rolls would be placed at all drainage features for the duration of construction and left in place two weeks after completion of construction. Good housekeeping measures would be practiced during construction. Site-specific stormwater BMPs would be detailed in a construction SWPPP, which would be prepared before breaking ground.

4.3.4.2 Groundwater

The desert location of Fort Irwin and the scarcity of water resources make water conservation and resource management critical. In order to conserve water resources on Fort Irwin, recycled water would be used for dust suppression during construction and maintenance activities instead of treated groundwater that is used for domestic purposes. Recycled water at Fort Irwin is typically used for irrigation of green spaces and for dust suppression.

4.4 Air Quality

This section evaluates potential air quality impacts and provides project design measures in case adverse air quality impacts were identified.

4.4.1 Significance Criteria

The air quality impacts of the project were evaluated by comparison of projected project emissions to the MDAQMD Significance Thresholds Rule 2002 and the general conformity *de minimis* thresholds. The MDAQMD Significance Thresholds were used to evaluate the impacts from construction and operation of the Proposed Action.

If the emissions are predicted to be less than the thresholds, it was assumed the Proposed Action would not violate an ambient air quality standard. The Proposed Action would be in a federal moderate non-attainment area for PM₁₀, so the general conformity *de minimis* threshold of 15 tons per year was used for the conformity applicability analysis.

4.4.2 Proposed Action

The Proposed Action would involve expanding the RV Park and constructing the proposed structures, which would require clearing approximately 15 acres. Construction activities would generally consist of grading, trenching, paving, and building construction.

4.4.2.1 Construction Phase

Project construction would result in short-term emissions of CO, nitrogen oxides (NO_x), volatile organic compounds (VOCs), sulfur oxides (SO_x), PM₁₀, and PM_{2.5}. Emissions are based on similar projects at Fort Irwin (i.e., construction schedule, phase duration, and construction equipment mix) and would result from construction equipment, vehicles, and fugitive dust emissions. Fugitive dust emissions include emissions from soil disturbing activities, unpaved roads, and paved roads.

Construction emissions were estimate using the South Coast Air Quality Management District's California Emission Estimator Model (CalEEMod) (version 2013.2.2) and assuming disturbance of approximately 15 acres. CalEEMod has default equipment mixes for grading, trenching, building construction and paving that were selected. PM₁₀ and PM_{2.5} emissions were mitigated based on the requirements outline in the *Federal Particulate Matter (PM₁₀) Attainment Plan* (MDAQMD, 1995) and MDAQMD Rules 403 and 403.2.

Mobile emissions would include personally owned vehicles used by construction workers and delivery trucks traveling to Fort Irwin. ARB's EMFAC2014 model (version 1.0.7) was used to calculate vehicle emission factors. It was assumed each construction work and delivery truck would travel 80 miles per

day round-trip to the construction site. Detailed emission calculations are provided in Appendix D. Table 4-1 compares the peak construction emissions with the MDAQMD thresholds.

The annual construction emissions would be less than the MDAQMD significance thresholds; therefore, construction of the Proposed Action would not have a significant adverse effect on air quality.

TABLE 4-1
Proposed Action Construction Emissions
RV Park Expansion Plan EA, Fort Irwin, California

Emission Source	Emissions for 2017 (tons per year)					
	VOCs	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Construction Emissions	0.0745	0.518	0.781	0.000660	0.0443	0.0403
Vehicle Emissions	0.0522	0.450	0.0912	0.000938	0.00917	0.00632
Total Emissions	0.127	0.967	0.873	0.00160	0.0535	0.0466
MDAQMD Thresholds (tons per year)	25	100	25	25	15	15
Thresholds Exceeded for Any Activity?	No	No	No	No	No	No

Source: Appendix D (*Record of Non-applicability and Air Quality Emissions Calculations*).

4.4.2.2 Operation and Maintenance Phase

No new air emission sources would result from the Proposed Action once constructed.

4.4.2.3 General Conformity

General conformity means compliance with the plan's purpose of attaining or maintaining the NAAQS. This means ensuring that a federal action would not cause a new violation of the NAAQS, contribute to any increase in the frequency or severity of violations of existing NAAQS, or delay the timely attainment of any NAAQS interim or other attainment milestones.

According to the MDAQMD *Federal Conformity Guidelines*, a project conforms if it meets the following conditions: (1) complies with all applicable district rules and regulations, (2) complies with all proposed control measures that are not yet adopted from the applicable plans, and (3) is consistent with the growth forecasts in the applicable plans (MDAQMD, 2011).

The Proposed Action would result in a short-term net increase in PM₁₀ emissions from construction activities. Construction emissions were compared with the *de minimis* threshold to evaluate general conformity applicability. Analysis indicates that emissions would be 0.0535 tons for 2017, well below the *de minimis* threshold of 15 tons per year. Therefore, the Proposed Action would not require a conformity determination. As required by the Army, a Record of Non-applicability (RONA) would be used to document that the Proposed Action is exempt from general conformity requirements. The RONA and detailed emission calculations are provided in Appendix D.

The Proposed Action would comply with the applicable MDAQMD rules and regulations and would comply with proposed control measures presented in the *List and Implementation Schedule for District Measures to Reduce PM Pursuant to Health and Safety Code §39614(d)* (MDAQMD, 2005). This analysis demonstrates that the Proposed Action conforms to the MDAQMD's approved air quality plan because the emissions of the non-attainment pollutant, PM₁₀, would be less than the general conformity *de minimis* threshold.

4.4.3 No Action Alternative

Under the No Action Alternative, there would be no effects to air quality, because no construction would occur.

4.4.4 Cumulative Impact

Constructing new facilities, as well as modifying existing facilities and infrastructure, are ongoing at Fort Irwin. Recently completed projects include construction of a new hospital and new water treatment plant (Irwin Water Works). Multiple other construction projects could occur on Fort Irwin simultaneously and could include wastewater and water infrastructure improvements, construction related to an Energy Savings Performance Contract at the Fort Irwin landfill, facilities to support the operation of a new Unmanned Aircraft Systems hangar and maintenance facility, a solar facility, and stormwater controls in the cantonment and in the Tiefert City training area. If all projects were to occur at one time, air quality issues related to dust created during construction could create a nuisance; however, dust suppression BMPs would be implemented on all Fort Irwin construction activities and these projects are spatially separated.

As shown in Table 4-1, construction emissions from the Proposed Action would be below the MDAQMD thresholds; therefore, the Proposed Action would not be expected to have an adverse cumulative effect on air quality. Calculations of anticipated construction projects, where information is available, indicate that the combined emissions from upcoming or planned projects) would be below MDAQMD thresholds as well (Appendix D).

4.4.5 Project Design Measures

Project design measures would be used during construction to reduce fugitive dust emissions. BMPs such as dust suppression techniques that could include spraying the ground with water would be implemented for construction and maintenance activities. Fort Irwin implements dust abatement programs that address problems associated with wind erosion and suspension of particles, including chemical stabilization and revegetation (Army, 2006). Additionally, the requirements set forth in MDAQMD Rule 403.2, Fugitive Dust Control for the MDPA, would be adhered to (MDAQMD, 1995). These requirements are listed in Section 4.1.4, *Project Design Measures* (of the *Soils* section).

4.4.6 Climate Change and Greenhouse Gases

4.4.6.1 Proposed Action

The Proposed Action would generate GHG emissions from construction related activities. Construction of the Proposed Action would result in a short-term insignificant increase in GHG emissions. Based on the draft NEPA guidance for considering GHG emissions, a value of 25,000 metric tons of CO₂e would indicate whether a qualitative or quantitative assessment may be meaningful for decision makers under NEPA (CEQ, 2014). Construction and maintenance emissions from the Proposed Action would be below this level. Estimated GHG emissions would be 164 tons CO₂e for construction in 2017 (Appendix D). Because of the amount of GHGs that would be emitted, no appreciable impacts with regards to GHGs would be expected.

4.4.6.2 No Action Alternative

Under the No Action Alternative, no construction would occur. Since there would be no change from existing activities, the No Action Alternative would not result in an increase in GHG emissions.

4.5 Cultural Resources

A significant effect on cultural resources (adverse effect) would occur if historic properties (NRHP-eligible resources) are destroyed, altered, or moved, or if their historic setting is altered.

4.5.1 Proposed Action

One isolated artifact was discovered within the APE as a result of the cultural investigation. Temporary CH-IF-01 is a single chalcedony flake. Isolates by their definition lack the data potential for eligibility to the NRHP. Therefore, the isolate is not significant and is not an historic property for the purposes of Section 106.

No archaeological or historic sites were discovered as a result of this investigation. With regard to the Proposed Action, no further work is recommended and a finding of “No Historic Properties Affected” in accordance with 36 CFR 800.4(d)(1) is appropriate. As with any ground-disturbing project, there remains some theoretical potential for the discovery of buried cultural resources not detected through a surface inventory. If cultural resources or archaeological materials are discovered during ground-disturbing activities, the work near the discovery should cease, and the area should be protected until the find can be evaluated by a qualified archaeologist. Consultation with affiliated federally recognized Native American tribes is ongoing. A copy of consultation letters provided to each affiliated federally recognized Native American tribe is included with the cultural resources report in Appendix C. Any concerns expressed by the Native American tribes, should they have any, would be addressed in the Final EA. Should the affiliated federally recognized Native American tribes express no concerns then no further correspondence would be provided.

4.5.2 No Action Alternative

The No Action Alternative would have no effects on cultural resources.

4.5.3 Cumulative Impacts

No cultural resources are present at or within the APE of the proposed project area. Therefore, no cumulative effects would occur.

4.6 Noise

This section describes potential impacts from noise during construction and O&M. Noise impacts would be significant if the following were to occur:

- Construction workers are exposed to noise levels above the threshold for hearing damage or loss without protective equipment to mitigate the sound energy
- Users of the RV Park are exposed to noise levels above the threshold for hearing damage or loss for extended time periods

4.6.1 Proposed Action

4.6.1.1 Construction Phase

Construction-related noise impacts would be associated with the operation of equipment and vehicles required for site preparation and building construction activities. Potential noise impacts from construction activities are assessed using a standard reference for construction noise (EPA, 1971). These data are presented in Table 4-2.

The closest potential noise-sensitive receptors (defined by the Army as housing, schools, and medical facilities) are the users of the existing RV Park which bound the proposed project location to the North. The nearest residential housing is located approximately 0.75-mile east of the proposed RV Park expansion site on North Loop Road. The closest school to the proposed RV Park expansion, Colin Powell Preschool, is approximately 1.1 miles from the Proposed Action site. The nearest hospital from the proposed RV Park expansion project location is the Weed Army Community Hospital, approximately 1.85 miles away.

TABLE 4-2
Noise Levels of Construction Equipment at 50 and 100 Feet
RV Park Expansion Plan EA, Fort Irwin, CA

Equipment	Noise Level at 50 Feet (dBA)	Noise Level at 100 Feet (dBA)
Earth-moving		
Front Loaders	79	73
Backhoes	85	79
Dozers	80	74
Tractors	80	74
Graders	85	79
Pavers	89	83
Trucks	82	76
Materials Handling		
Concrete Mixers	85	79
Concrete Pump	82	76
Crane	83	77
Concrete Crushers	85	79
Stationary		
Pumps	76	70
Generator	78	72
Compressors	81	75
Impact		
Jack Hammers	88	82
Pneumatic Tools	86	80
Other		
Saws	78	72
Vibrators	76	70

Source: U.S. Environmental Protection Agency (EPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*.

As shown, heavy equipment can generate noise levels ranging from approximately 76 to 89 dBA when measured at 50 feet and 70 to 83 dBA when measured at 100 feet without implementation of noise-reduction measures. A temporary increase in noise levels would be expected during the construction phase of the Proposed Action. Noise levels as high as 89 dBA associated with construction activities could be experienced at the closest temporary residences located 50 feet to the north. Typically, the amount of noise from a continuous source is halved (reduced by three dBA) as the distance from the source doubles (EPA, 1974). The noise level at (0.75-mile) 4,000 feet from an 89-dBA construction noise source would be 71 dBA.

A temporary increase in noise levels would be expected during the construction phase of the Proposed Action. The loudest anticipated construction noise level average at the existing RV Park and residential housing on North Loop Road would be 89 dBA and 64 dBA, respectively, which would only occur from using pavers.

The anticipated noise levels from construction could cause annoyances to users of the existing RV Park. The nearest permanent residents on North Loop would experience less construction noise due to the structure of the buildings, which could reduce noise levels by up to 25 dBA, though the reduction in noise in an RV would likely be less (EPA, 1974). Residents on North Loop Road would not likely perceive noise from construction activities when indoors. Construction of the Proposed Action would only occur during the daytime hours and any impacts would be temporary. The noise levels produced during construction would not be continuous and would only be intermittent and short-term. Additionally, noise abatement barriers may be employed if necessary.

Construction of the Proposed Action would cause minor adverse impacts due to nuisance noise levels potentially experienced by residents using existing RV Park and residents in military family housing.

4.6.1.2 Operation and Maintenance Phase

Noise-generating activities during regular operation would include additional RV engines, additional generators, and delivery of supplies and maintenance operations. The noise from these activities may create temporary nuisance conditions, especially for persons who are outdoors at the time, but would not create health risks and would be consistent with the expected experience of persons staying in an RV Park.

4.6.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue into the future.

4.6.3 Cumulative Impacts

Cumulative impacts would result from individually minor but collectively more impactful actions taking place over a period of time. Noise impacts from the Proposed Action would be temporary and would occur only during construction. It is unlikely that all projects at Fort Irwin would be constructed at the same time. Because of the short duration of noise impacts from the Proposed Action and the construction schedule, and because of the low level of noise generation during operation, cumulative impacts concerning noise would be unlikely. Noise abatement barriers may be employed if necessary.

4.6.4 Project Design Measures

Project design measures would be implemented during the construction and operation phases of the Proposed Action. To reduce noise levels experienced at sensitive receptor locations during construction, activities would occur only during normal daytime work hours. Noise abatement barriers may be employed if necessary.

4.7 Utilities

An impact to utilities would be considered significant if usage increases resulting from the Proposed Action are above the capacity of existing supply or infrastructure.

4.7.1 Proposed Action

4.7.1.1 Construction Phase

Water Treatment and Distribution

Recycled water would be used for dust suppression and other non-potable uses during construction. Construction workers would likely bring water from outside of Fort Irwin for potable uses. Connections to the Fort Irwin water distribution system would not be expected to result in service disruptions to

other users. No impact to the Fort Irwin water system would be expected during construction of the Proposed Action.

Wastewater

There would be a negligible short-term increase in wastewater generation during construction. This wastewater may be handled through the Fort Irwin wastewater system or it may be handled through portable toilets and treated outside of Fort Irwin by construction workers. Wastewater produced during construction would be within the capacity of the WWTP and would be non-hazardous. Connections to the Fort Irwin wastewater system would not be expected to result in service disruptions to other users. There would be a short-term negligible impact to the Fort Irwin wastewater system during construction of the Proposed Action.

Stormwater

There would be no impacts to the Fort Irwin stormwater system during construction of the Proposed Action. Standard construction BMPs would be used during construction to reduce impacts from erosion and stormwater runoff.

Energy

The construction contractor would provide fuel for equipment during construction. No disruptions to the Fort Irwin energy system would be expected during site connections during construction. No impact to the Fort Irwin energy system would be expected during construction of the Proposed Action.

Solid Waste Management

Solid waste generated during construction of the Proposed Action would generally be related to debris and vegetation removed during land clearing and small amounts of discarded construction materials. No demolition would be required. The contractor could dispose of solid waste either outside of Fort Irwin at an approved landfill with capacity or at the Fort Irwin landfill where there is capacity. Solid wastes would be recycled to the extent possible. There would be a negligible impact to solid waste management during construction of the Proposed Action.

4.7.1.2 Operation and Maintenance Phase

Water Treatment and Distribution

It would be expected that visitors of the RV Park would use water from the site connections or water at the comfort station for daily activities. Many of the visitors to the RV Park stay for extended periods of time and require laundry services. According to a recent U.S. Department of Agriculture (USDA), Forest Service study on water usage in recreation areas, consumer water use of a trailer site with water and sewer connections is approximately 50 gpd per person (USDA, 2007). With the addition of 59 RV stations with water and sewer connections and an estimated two people occupying each RV, at year-round capacity, water consumption for the expanded RV Park would increase approximately 5,900 gpd or 0.0059 mgd. Given the current average daily use of water at Fort Irwin (1.92 mgd), there would be an increase of 0.003 percent of water usage at Fort Irwin, which is well within the capacity of the Irwin Water Works. The comfort station would be LEED silver-certified and would likely be more efficient than facilities used in USDA estimations for water usage at recreation areas. LEED-certified buildings incorporate design features, such as low-flow showers, to reduce and conserve water usage. The increase in water consumption due to the Proposed Action would result in a long-term negligible impact to the Fort Irwin water system.

Wastewater

Trailers using the RV Park expansion area would either dispose of wastewater at individual connections that would be installed at each RV station or at an existing RV septic receiving station. The wastewater would be treated at the Fort Irwin WWTP. Based on estimated increases in water usage resulting from

operation of the RV Park expansion there would be an increase of less than 0.0059 mgd of wastewater produced if all 59 RV stations were occupied with two people all year. Under this scenario the average daily amount of wastewater produced at Fort Irwin (0.98 mgd) would increase by approximately 0.006 percent. The increase in wastewater produced as a result of the RV Park expansion would be within the capacity of the Fort Irwin WWTP. The comfort station would be LEED silver-certified and would likely be more efficient than estimates. It would be likely that a majority of the wastewater produced from operation of the RV Park expansion would be recycled. Long-term operation of the RV Park expansion would result in a negligible impact to the Fort Irwin wastewater system.

Stormwater

Stormwater controls, such as diversion channels or berms, would be installed as needed to protect the RV Park expansion area from potential flooding. The stormwater controls would connect with existing controls in the cantonment area. The increase in impervious area resulting from the Proposed Action would increase stormwater runoff. Stormwater controls would be installed as needed to prevent potential adverse impacts associated with increased runoff and velocities due to the increase in impervious area. Low impact development criteria would be incorporated into the design of the RV Park expansion, which would include permanent measures to reduce effects from stormwater due to the increase of impervious area. Impacts to the Fort Irwin stormwater system would be negligible.

Energy

There would be a negligible long-term increase in use of electricity as a result of the RV Park expansion. Each RV station would have a 50-amp electrical hook-up and the expansion could include a 500-kV pad-mounted transformer. The comfort station would be LEED silver-certified and the RV Park expansion would use low impact development techniques to reduce energy consumption. It would not be expected that the Fort Irwin electrical distribution system or capacity would need to be upgraded as a result of the Proposed Action. There would be a negligible impact to energy use as a result of the Proposed Action.

Solid Waste Management

Solid waste generated as a result of the Proposed Action would be approximately six pounds per day per RV station if occupied by two people, which would result in approximately 129,210 pounds of solid waste per year (USDA, 1999). The solid waste would likely be disposed of at the Fort Irwin landfill, which has ample capacity. Recycled waste receptacles would be provided. There would be negligible impacts to solid waste management as a result of the Proposed Action.

4.7.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue.

4.7.3 Cumulative Impacts

Additions of new facilities and modification to existing facilities and infrastructure are ongoing at Fort Irwin. The utility systems of the installation are adequate to accommodate fluctuations in utility usage and the overlap of multiple projects. The Proposed Action would be designed using low impact development criteria and the proposed comfort station would be LEED silver-certified, which would reduce utility consumption of the proposed RV Park expansion. Fort Irwin is also planning to construct alternative energy sources such as a solar facility and waste to energy facility. With planned construction of alternative energy sources and because the RV Park expansion would be designed as a low impact development and would include a LEED silver-certified comfort station, cumulative impacts to utilities resulting from the Proposed Action would be negligible.

4.8 Hazardous Materials

This section address potential impacts related to hazardous materials and wastes. Impacts related to hazardous materials and wastes would be significant if the following were to occur:

- An area currently managed under the IRP would be affected such that workers or users of the RV Park would be exposed to potential environmental contamination.
- Use or storage of hazardous materials would increase such that a new permit or a modification of an existing permit would be required.
- A new hazard is created with risks that could not be mitigated.

4.8.1 Proposed Action

4.8.1.1 Construction Phase

The project area is not within an IRP area, so construction workers would not be at risk of exposure to existing environmental contamination.

It is unlikely that the construction crew would encounter MEC during construction of the Proposed Action. However, if MEC are identified, range operations will be contacted immediately and appropriate measures would be implemented to protect worker safety.

Project construction would require that petroleum, oil, and lubricant materials, and other potentially hazardous materials be transported to and used in the project area. Equipment servicing and repair activities temporarily could generate oily and hazardous wastes, such as spent solvents, residual fuels, used oils, antifreeze, and filters. Construction activities would be conducted consistent with hazardous waste and pollution regulations, with guidelines dictated in a SWPPP, and uncontrolled releases of hazardous substances to the environment would not be anticipated.

BMPs documented in a SWPPP and a project-specific site construction safety plan would be followed to avoid significant risks or health hazards associated with the use of hazardous materials and hazardous waste generation and disposal.

4.8.1.2 Operation and Maintenance Phase

The project area is not within an IRP area. Users of the RV Park would not be at risk of exposure to existing environmental contamination.

The operation of a propane filling station would present a potential fire and explosion risk. Construction of a shaded awning and protective bollards around the perimeter of the tank would prevent potential vehicle collision with the propane tank. The propane storage tank would be secured to prevent unauthorized access.

There would be no appreciable increase in the use of hazardous or toxic substances during operation and maintenance of the expanded RV Park.

4.8.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue into the future.

4.8.3 Cumulative Impacts

The use of hazardous materials associated with additions of new facilities, and modifications to existing facilities and infrastructure are ongoing at Fort Irwin. However, adverse cumulative impacts are not anticipated.

4.8.4 Project Design Measures

Construction of a shaded awning and protective bollards around the perimeter of the tank would prevent potential vehicle collision with the propane tank.

4.9 Health and Human Safety

A significant impact to health and human safety would include the following:

- Conducting activities exposing workers to unsafe or hazardous conditions, such as contaminated soils or disease vectors
- Conducting activities that create unsafe conditions for the long-term with potential to adversely affect the public or personnel on Fort Irwin

4.9.1 Proposed Action

4.9.1.1 Construction Phase

The project area is not within an IRP area. Construction workers would not be at risk of exposure to existing environmental contamination.

No impacts to health and human safety would be expected from MEC within the project area, as MEC is not known or expected to occur in the project area.

Individuals constructing the proposed RV Park expansion project would potentially be exposed to valley fever. The potential exposure to valley fever would be reduced with the use of dust suppression measures, as described in the Soils and Air Quality Sections.

Mitigation measures as described in Section 4.9.4, *Project Design Measures*, would be implemented during construction. Impacts to construction workers would be less than significant with implementation of dust suppression measures and mitigation measures listed in Section 4.9.4.

4.9.1.2 Operation and Maintenance Phase

Users of the RV Park would have the same potential for impacts to health and human safety as described for construction workers. Measures to reduce impacts would be the same as those described for construction impacts, except the dust suppression would not be implemented. However, the potential for exposure to valley fever would be less because soils would not be disturbed during routine O&M activities would involve only minimal soil disturbance.

4.9.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue.

4.9.3 Cumulative Impacts

There could be cumulative effects on human health and safety. Constructing new facilities, as well as modifying existing facilities and infrastructure, are ongoing at Fort Irwin. Recently completed projects include construction of a new hospital and new water treatment plant (Irwin Water Works). Multiple other construction projects could occur on Fort Irwin simultaneously and could include, wastewater and water infrastructure improvements, construction related to an Energy Savings Performance Contract at the Fort Irwin landfill, facilities to support the operation of a new Unmanned Aircraft Systems hangar and maintenance facility, a solar facility, and stormwater controls in the cantonment and in the Tiefert City training area. If multiple construction projects were to occur at one time, windborne soil and the potential for people to be exposed to valley fever could increase due to construction activities. However, dust suppression BMPs would be implemented on all Fort Irwin construction activities, and not all construction projects are expected to occur simultaneously. Health and safety effects from the Proposed Action would be short-term and would not contribute to any long-term cumulative effects.

4.9.4 Project Design Measures

The following measures would be implemented during construction and maintenance activities to reduce the potential exposure to and effects from valley fever, which would not apply to military personnel that may be utilized for training purposes:

- A brochure detailing valley fever, its cause, and symptoms would be made available to those working in the project area. The brochure would include information on how to control the spread of the illness, such as changing clothes daily, using respiratory protection, applying water to the soil, and cleaning equipment and materials.
- Breathing protection gear would be made available to all workers, at their request and at no cost to the worker.
- Workers would be educated through briefings to recognize the symptoms of valley fever, and to quickly report suspected symptoms of work-related valley fever.
- Signs would be posted at the project site notifying visitors and workers to the threat of valley fever.

4.10 Aesthetics

Impacts to aesthetics would be considered significant if the following were to occur:

- There is a substantial adverse effect on a scenic vista.
- The existing visual character or quality of a site and its surroundings is substantially degraded.

4.10.1 Proposed Action

Individuals with potential to perceive a change in aesthetics resulting from the proposed RV Park expansion would be users of the existing RV Park and motorists traveling on Goldstone Road to the north of the Proposed Action area and those using the High Desert Equestrian Club to the west of the Proposed Action site. Depending upon the perception of the individual the change in aesthetics could be perceived as an improvement from existing conditions. Expansion of the proposed RV Park would not likely be perceived as a temporary adverse impact, although impacts would be temporary and fairly consistent with other construction projects ongoing at Fort Irwin. Once constructed, the proposed RV Park expansion would likely be perceived as an improvement to the viewshed. The adjacent area is developed for community uses and was historically used as an ammunition storage area. There would be no loss of a pristine viewshed or obstruction to the landscape. There would be negligible impacts to aesthetics as a result of the change in the viewshed as a result of the Proposed Action.

4.10.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue.

4.10.3 Cumulative Impacts

No significant effects on aesthetics would be expected as a result of the Proposed Action. Other planned or ongoing construction projects on Fort Irwin mainly occur within the cantonment, which is not visible from the project area. Future or ongoing construction projects in the training areas of Fort Irwin are spaced far from the Proposed Action and would likely not interact with or compound the effects on aesthetics resulting from the Proposed Action. Cumulative impacts to aesthetics resulting from the Proposed Action would be less than significant.

4.11 Transportation

Transportation effects are considered significant if the following were to occur:

- Emergency vehicles cannot perform their duties
- The level of service for traffic flow is reduced
- Traffic routes are disrupted for the long term

4.11.1 Proposed Action

4.11.1.1 Construction Phase

During the construction period, vehicle trips associated with workers and deliveries to the project area would occur. If a construction company is utilized, the estimated 100 construction workers needed to construct the proposed RV Park expansion would reside off-post because onsite accommodations are not available to the general public. It is likely that the Barstow and Victorville areas would contribute the largest share of workers. Construction workers likely would commute to the jobsite on a daily basis. If a sufficient number of workers are not available locally, workers from more distant locations could take up temporary residence in local hotels, motels, apartments, campgrounds, and RV parks for the duration of construction.

Fort Irwin generates all of the traffic using Outer Loop Road and Goldstone Road. With the exception of some congestion at the center of the installation during the morning, noontime, and evening rush hours, the Fort Irwin roadways operate within their design capacities. Traffic associated with construction of the proposed RV Park expansion would be limited to material delivery and worker access and would not result in a substantial increase in traffic compared to the existing traffic load. Fort Irwin would utilize a quarry northeast of the cantonment and trucks transporting rock to the project area would not pass through the cantonment or any other public road. Therefore, the Proposed Action would not result in significant adverse traffic impacts.

Fort Irwin Road has adequate road capacity to accommodate the increase in daily trips. Vehicle trips destined for the project area would likely utilize Outer Loop Road to avoid high traffic areas within the cantonment. The increase in traffic that could result from the transport of workers and materials to the project area during construction would not be expected to result in a level of service change to the existing roadways or impede emergency vehicles. Parking, equipment, materials, and staging areas would be located within the project area. Traffic impacts due to construction and construction worker commutes would be temporary and negligible.

4.11.1.2 Operation and Maintenance Phase

The expanded RV Park would only have two to three part-time employees who would access the proposed RV Park for janitorial services, routine maintenance, and operation of the registration booth. These individuals could live off-post and commute to Fort Irwin. The addition of two to three vehicles to Fort Irwin Road per week would have negligible effects on local traffic.

A minor increase in traffic resulting from the addition 59 RV spaces would be likely. However, it is unlikely there would daily turnover for each of the additional spaces because most spaces are occupied for extended periods. Any increase in traffic on Fort Irwin would be negligible and would have negligible impacts on traffic flow and transportation.

4.11.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue.

4.11.3 Cumulative Impacts

The number of personnel assigned to Fort Irwin would fluctuate throughout the year and with changes in mission. Additions of new facilities, and modifications to existing facilities and infrastructure, are ongoing at Fort Irwin. The transportation infrastructure of the installation is adequate to accommodate these fluctuations and the overlap of multiple changes. Adverse cumulative impacts would not be anticipated.

4.11.4 Project Design Measures

In the absence of significant impacts such as increased congestion on highways, streets, and at intersections or a decline in performance (level of service), project design measures are not required.

Traffic control personnel provided by the contractor could be used if necessary to maintain flow of traffic during construction or for equipment deliveries. Implementation of ride-share and carpooling programs during the construction phase would reduce traffic impacts that might occur.

4.12 Recreation

Impacts to recreation would be considered significant if there was a loss of recreational opportunities that could not be mitigated.

4.12.1 Proposed Action

4.12.1.1 Construction Phase

Short-term, negligible impacts to surrounding recreational areas would be expected from noise and traffic associated with construction of the proposed RV Park expansion.

4.12.1.2 Operation and Maintenance Phase

There would be no adverse effects to recreation from O&M of the expanded RV Park. There would be a long-term benefit from additional capacity for RVs, construction of a comfort station, and upgraded utilities from the Proposed Action.

4.12.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and current conditions would continue.

4.12.3 Cumulative Impacts

There would be no cumulative Impacts to recreation from the construction and O&M of the expanded RV Park.

4.13 Summary of Impacts and Project Design Measures

The resources with potential impacts and the project design measures implemented to reduce adverse environmental impacts of construction and O&M of the Preferred Alternative are summarized in Table 4-3.

TABLE 4-3

Summary of Project Design Measures

RV Park Expansion Plan EA, Fort Irwin, California

Resource	Potential Effect	Construction and O&M Design Measures
Geology, Soils, and Mineral Resources		
	Soil erosion	Construction Phase: Employ BMPs for control of erosion and sediment. Prepare and implement SWPPP.
Biological Resources		
	Desert tortoise (may affect, but not likely to adversely affect)	Construction Phase: Before construction begins, personnel working on the site would be given a briefing on the desert tortoise, detailing its life history as well as the protocol to follow if a tortoise is encountered. Within two weeks of the onset of construction, 100 percent coverage ground surveys would be conducted of the project area for tortoises, signs of use, or burrows. If no tortoises or active burrows are identified, then construction would proceed without interruption.

TABLE 4-3

Summary of Project Design Measures*RV Park Expansion Plan EA, Fort Irwin, California*

Resource	Potential Effect	Construction and O&M Design Measures
Special-status species and avian species (potential disturbance)		<p>During land clearing and construction, a biological monitor would be available to observe construction activities and to verify that no tortoises wander into the construction area. If a tortoise is present, construction in the immediate vicinity would be halted while the tortoise is relocated out of the construction area.</p> <p>Desert tortoise exclusion fencing would be placed at staging and parking areas. Desert tortoise guards would be placed at entrances to the staging and parking areas. Fence installation would be overseen by an authorized biologist.</p> <p>Desert tortoise burrows located within 100 feet of the limits of construction would be marked and protected by conducting additional briefings on their location to insure avoidance. Desert tortoise burrows that cannot be avoided would be excavated by hand either by an authorized biologist or under his/her direct supervision. Burrow excavation and subsequent handling of any desert tortoise would follow the most up-to-date guidelines that are acceptable to USFWS.</p> <p>Workers will be required to inspect the underside of all onsite parked vehicles before moving them (unless parked in staging or parking area protected by exclusion fencing). If a desert tortoise is detected, then an authorized biologist will remove the animal to a safe place or wait until the animal moves to safety on its own.</p> <p>O&M Phase: Channels and basins would be designed so that desert tortoise can pass through these features unimpeded and so that desert tortoise would not be constrained in these features.</p> <p>Speed limits in and around the project area will be enforced throughout construction and maintenance activities. Vehicles shall not exceed 15 mph on unpaved roads and the right-of-way accessing the construction sites or 10 mph during the night.</p> <p>Construction Phase: Land and vegetation clearing would occur outside the breeding season for birds of concern, defined as February 15 to August 31, where practicable.</p> <p>If vegetation clearing is required during the breeding season, then preconstruction surveys of breeding birds would be conducted. If active nests are identified, they would be protected from disturbance by a 500-foot nesting buffer, which would remain in place until the young have fledged from the nest, and no new nests would be initiated for the season.</p> <p>If a kit fox burrow is identified on or adjacent to the project area during the preconstruction survey, Fort Irwin natural resources staff will be contacted. Fort Irwin staff would determine the status of the burrow and establish an exclusion zone if necessary. Fort Irwin would decide if fencing or flagging would suffice to delineate the exclusion zone.</p>

TABLE 4-3

Summary of Project Design Measures*RV Park Expansion Plan EA, Fort Irwin, California*

Resource	Potential Effect	Construction and O&M Design Measures
	Pest species	<p>Construction Phase: During construction, all trash and debris would be placed in receptacles for delivery to approved landfill facilities. Site cleanup of trash and debris would be required on a daily basis, including emptying and disposing of trash receptacles.</p> <p>O&M Phase: Proper waste management on the RV Park grounds would limit the potential for pest species to occur.</p>
Water Resources		
Surface Water	Soil erosion, runoff, and sedimentation impacts	<p>Construction Phase: Proper BMPs would be implemented before land grading begins. Natural vegetation would be preserved when possible. Erosion, runoff, and sediment control measures would be implemented in case of a stormwater event. Erosion control measures such as compost blankets, mulching, watering, riprap, seeding and sodding, geotextiles, and slope drains could be used to protect exposed soil and minimize erosion. BMPs such as check dams, slope diversions, and temporary diversion dikes could be implemented for runoff control. Sediment control measures that could be implemented include compost filter berms and socks; fiber rolls or berms; sediment basins, rock dams, filters, chambers, or traps; silt fences; storm drain inlet protection; and hay bales. Good housekeeping measures would be practiced during construction. Site-specific stormwater BMPs would be detailed in a construction SWPPP that would be prepared by the contracted construction company prior to breaking ground.</p> <p>O&M Phase: During operation of the Proposed Action, potential impacts on surface waters would be minimized by practicing good housekeeping at the facility to prevent any unwanted materials from being washed away during storm events. Examples of good housekeeping practices could include proper materials storage and keeping the site free of spills. Post-construction BMPs, consisting of detention ponds, would maintain pre-development runoff flows for 10-year floods and attenuate larger storm events.</p>
Water Supply	Increase in water usage	<p>Construction Phase: Recycled water would be used for dust suppression during construction and maintenance activities instead of treated groundwater.</p> <p>O&M Phase: Use of xeriscaping is planned for the Proposed Action. Continuing current education and conservation programs could reduce water demand by as much as 5 percent.</p>
Air Quality	Fugitive dust impacts	<p>BMPs such as dust suppression techniques that could include spraying the ground with water would be implemented for construction and maintenance activities. Fort Irwin implements dust abatement programs that address problems associated with wind erosion and suspension of particles, including chemical stabilization and revegetation. Additionally, the requirements set forth in Rule 403.2, Fugitive</p>

TABLE 4-3

Summary of Project Design Measures*RV Park Expansion Plan EA, Fort Irwin, California*

Resource	Potential Effect	Construction and O&M Design Measures
		Dust Control for the MDPA, would be adhered to, and would include implementation of a dust control plan.
Noise	Noise impacts during construction	Construction Phase: Construction would only occur during normal daytime working hours. Noise abatement barriers may be employed if necessary.
Hazard Materials	Explosion from impact to propane filling station	Construction of a shaded awning and protective bollards around the perimeter of the tank would prevent potential vehicle collision with the propane tank.
Health and Human Safety	Potential exposure to valley fever	Construction Phase: Use of dust suppression measures would be implemented to reduce potential exposure to valley fever. A brochure detailing valley fever, its cause, and symptoms would be made available to those working in the project area. The brochure would include information on how to control the spread of the illness, such as changing clothes daily, using respiratory protection, applying water to the soil, and cleaning equipment and materials. Breathing protection gear would be made available to all workers, at their request and at no cost to the worker. Workers would be educated through briefings to recognize the symptoms of valley fever, and to quickly report suspected symptoms of work-related valley fever. Signs would be posted at the project site notifying visitors and workers to the threat of valley fever.

Notes:

BMP = best management practice

MDPA = Mojave Desert Planning Area

SWPPP = Stormwater Pollution Prevention Plan

2014 USFWS BO = *Biological Opinion for Operations and Activities at Fort Irwin, San Bernardino County, California* (USFWS, 2014)

SECTION 5

List of Preparers

TABLE 5-1

List of Preparers

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Rich Reaves	Ph.D. Wetland and Wildlife Ecology	23
Caitlin Santinelli	B.S. Earth and Atmospheric Sciences	8
Josh Jamell	B.S. Ecology	15
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SECTION 6

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SECTION 7

Distribution List

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Appendix A Correspondence

No correspondence has been received as of August 3, 2016.

Appendix B
Natural Resources Survey Report



**Department
Of the Army**

Final Natural Resources Report for the Recreational Vehicle Park Expansion Fort Irwin, California



**Installation
Management
Command**

July 2016

Executive Summary

This report describes the existing biological resources associated with the proposed Recreational Vehicle Park Expansion Plan (Project) site. The proposed site is located within the boundaries of Fort Irwin, a U.S. Army installation in San Bernardino County, located approximately 37 miles (59.54 kilometers) northeast of Barstow, California. The Project site is in the western region of the cantonment area on the south side of Goldstone Road. The cantonment area occupies approximately 14,309 acres (5,791 hectares), and provides temporary and permanent living quarters for soldiers and their families along with support facilities. Vegetation at the proposed site consists primarily of disturbed Mojave creosote (*Larrea tridentata*) scrub vegetation. The natural resources survey identified the vegetation communities and common species, and surveyed for special-status species and their habitat present within the site. Specific surveys for special-status species focused on the desert tortoise (*Gopherus agassizii*) and Mohave ground squirrel (*Xerospermophilus mohavensis*) (MGS) and included a protocol-level survey for the desert tortoise and camera trapping to potentially detect the presence of MGS within the proposed Project site.

No desert tortoise sign or MGS were observed within the Project site. No other sign of listed species using the proposed Project site was observed. It is still possible that migratory birds (protected by the Migratory Bird Treaty Act) may use the site for nesting in the spring; therefore, if construction is to occur in spring, a pre-construction nesting bird survey may be needed.

Contents

Section	Page
Executive Summary.....	iii
Acronyms and Abbreviations	v
1 Introduction	1-1
1.1 Project Description	1-1
1.2 Site Location	1-1
2 Methods.....	2-1
2.1 Survey Methodology	2-1
3 Results.....	3-1
3.1 Site Characteristics	3-1
3.2 Camera Trapping Surveys.....	3-2
3.3 Sensitive Species	3-4
3.3.1 Desert Tortoise.....	3-5
4 Conclusions and Recommendations.....	4-1
4.1 Conclusions.....	4-1
4.2 Recommendations	4-1
5 References.....	5-1

Appendices

A	Project Site Photographs
B	Camera Trapping Data
C	Camera Trapping Survey Photographs

Tables

3-1	Observed Fauna (including sign) and Flora
3-2	Camera Trapping Data Summary for March and April Surveys
3-3	Camera Trapping Data Summary for June Survey

Figures

1-1	Location Map
2-1	Project Location Map and Camera Trapping Locations
3-1	Sensitive Species Sign

Acronyms and Abbreviations

amsl	above mean sea level
Army	U.S. Army
CH2M	CH2M HILL, Inc.
CNPS	California Native Plant Society
GIS	geographic information system
GPS	global positioning system
ICRMP	Integrated Cultural Resources Management Plan
MBTA	Migratory Bird Treaty Act
MGS	Mohave ground squirrel
Project	Recreational Vehicle Park Expansion
RV	recreational vehicle
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

SECTION 1

Introduction

This report presents the results of a natural resources survey, a protocol-level survey for the desert tortoise, and camera trapping for Mohave ground squirrel. The survey was conducted at the site proposed for the Recreational Vehicle (RV) Park Expansion (Project) at Fort Irwin, California.

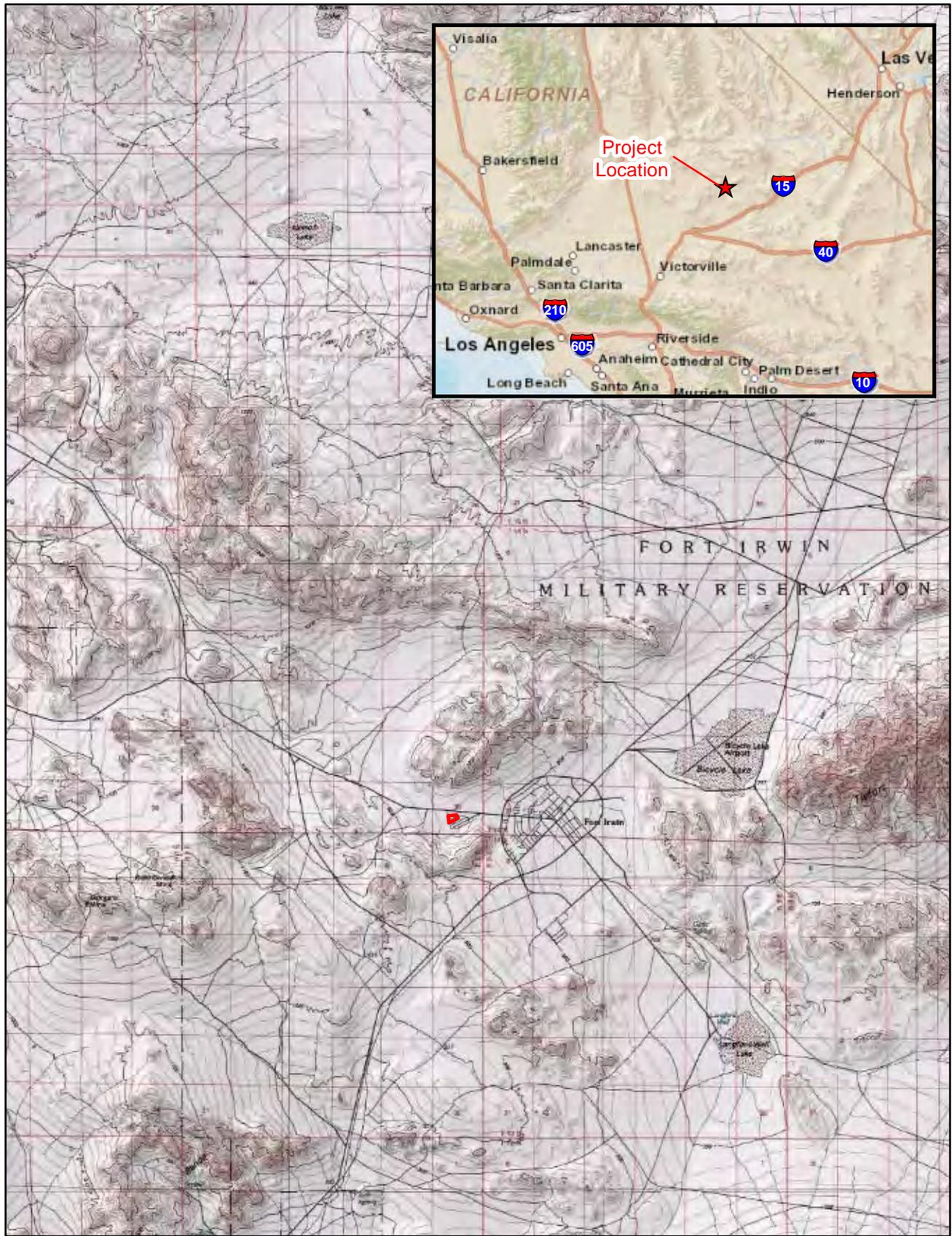
1.1 Project Description

Fort Irwin proposes an RV Park expansion to construct a new RV park with 59 concrete pads, comfort station, check-in station, electrical hook-ups, dump station, and a propane refilling station on approximately 15 acres (six hectares) of land adjacent to the existing RV park. This proposed action also includes construction of a water line from the new Fort Irwin water treatment plant, construction of a sewer line, and installation of electrical and fiber optic communication lines.

1.2 Site Location

Fort Irwin, also known as the National Training Center, is in southeast California, 37 miles (59.54 kilometers) northeast of Barstow in the Mojave Desert in northern San Bernardino County. Fort Irwin was designated as a permanent installation in 1961 and today encompasses approximately 753,537 acres (304,946 hectares). The installation is approximately 25 miles (40.23 kilometers) from Interstate 15, midway between Las Vegas and Los Angeles (Figure 1-1).

Fort Irwin serves as the U.S. Army's (Army) premier training center. Approximately 80 percent of the land area of Fort Irwin is used for military training. The Fort Irwin cantonment area contains the concentrated developed core of the installation and consists of temporary and permanent living quarters for soldiers and their families along with support facilities, retail centers, restaurants, and health care facilities. It consists of approximately 14,309 acres (5,791 hectares) of developed or partially developed area. The Project area, which encompasses 15 acres (six hectares), is located in the western region of the cantonment area on the south side of Goldstone Road



Legend

 Project Area

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
 Copyright: © 2013 National Geographic Society, i-cubed

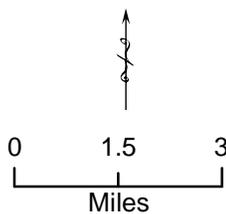


Figure 1-1
 Location Map
 RV Park Expansion Natural Resources Report
 Fort Irwin, CA

SECTION 2

Methods

CH2M HILL, Inc. (CH2M) conducted natural resource surveys to determine the presence of federally listed and state-listed species and their habitat within the proposed Project site. The survey areas are shown on Figure 2-1.

2.1 Survey Methodology

Surveys were conducted by a four-person team of CH2M biologists. The natural resources survey of the Project site included the following:

- Preliminary characterization of plant communities present on the site
- Photographs of the site
- Documentation of sensitive species habitat, species, or sign observed during the survey
- Documentation of common plant and animal species observations
- Camera trapping

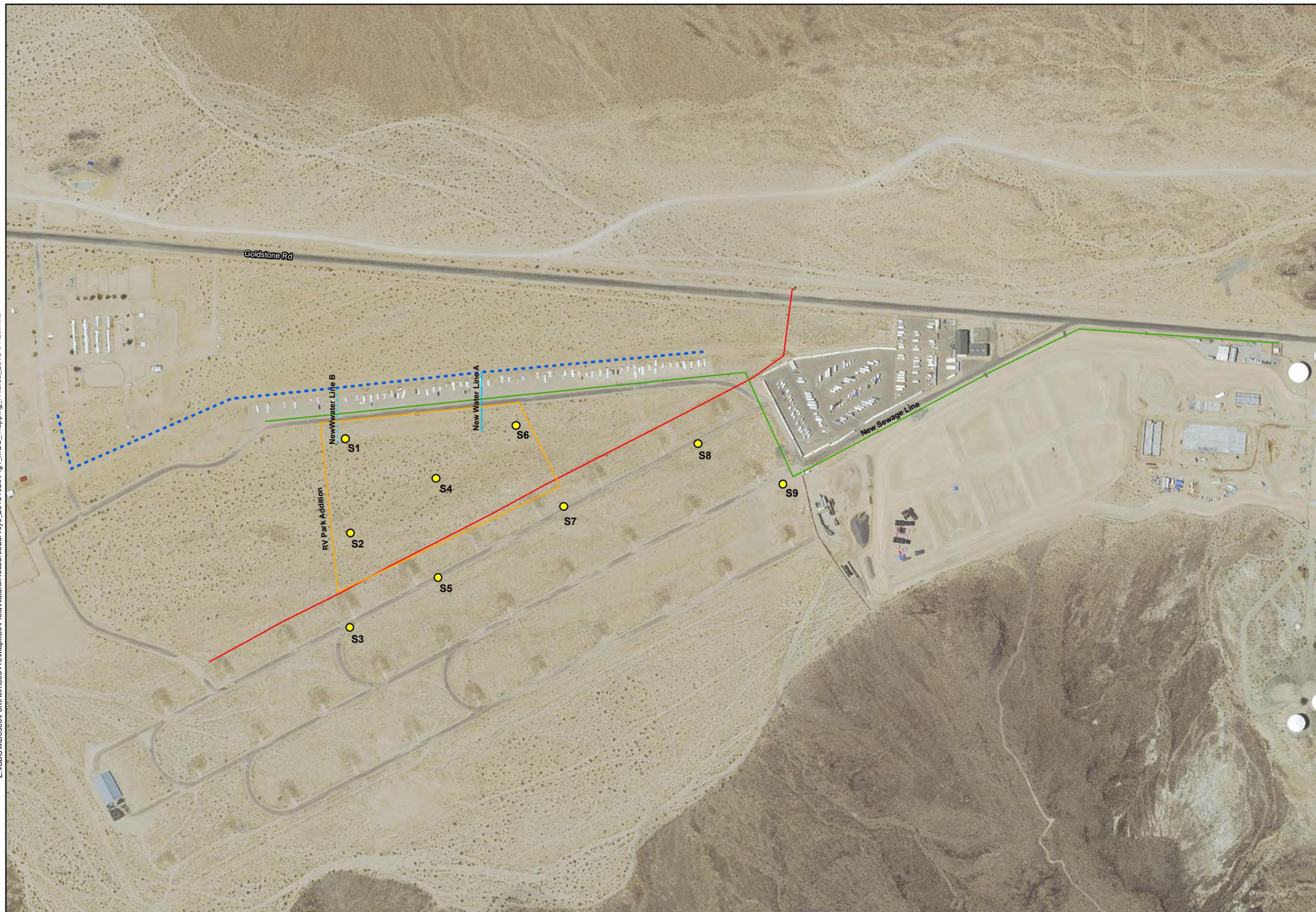
The desert tortoise protocol survey was conducted according to the *Desert Tortoise Pre-project Survey Protocol 2010 Field Season* (U.S. Fish and Wildlife Service [USFWS], 2010) by walking transects at 33-foot (10-meter) spacing throughout all accessible, appropriate habitat on the sites (see Appendix A, Photo 1). The protocol survey was performed on October 28, 2015. Any tortoise or large mammal burrows encountered that could potentially be used by tortoises were visually inspected. Very small burrows that could be potentially used by juvenile tortoises but are more often rodent burrows were also visually checked when encountered. Only definitive tortoise sign was recorded. A Trimble global positioning system (GPS) unit was used to orient and guide the survey. Transect routes were generated prior to conducting the fieldwork and uploaded into the GPS unit.

Nine Mohave ground squirrel (MGS) camera trapping stations were established approximately 410 feet (125 meters) apart along the proposed construction route (Figure 2-1) from March 21–25, 2016 and April 4–9, 2016. The CH2M biologist who led the survey is experienced in using camera traps for wildlife studies from her work with U.S. Geological Survey (USGS) (there is no established protocol for camera trapping for MGS). Each camera station consisted of a single, Browning Trail Camera Strike Force Elite HD (0.4-second trigger speed, which is adequate to capture small mammals) installed at a height of one foot, eight inches (0.5 meter) on a slightly slanted T-post hammered into the ground. Cameras were set to have a one-minute delay between photographs. The delay was used to prevent battery failure and also limit over-photographing non-target wildlife species (i.e., nocturnal animals since the cameras were operating 24 hours per day), which can take up significant space on a memory card. Stations were placed on the northeastern side of prominent shrubs to afford cover and shade for animals investigating the baited stations. Bait consisted of livestock sweet feed, peanut butter, and rolled oats. Stations were re-baited every 24 hours to maximize visitation by local wildlife. Cameras were set to operate at the highest sensitivity. Photograph data for wildlife and domestic animals were recorded in a Microsoft Excel database, which is provided in Appendix B. All individuals were recorded and photographs that occurred within a five-minute timespan were counted as the same individual. If six or more minutes passed between photographs, the photograph subject was counted as a new individual. Only new individuals were included in the “Number of Individuals” column within the database to minimize overestimating abundance.

Fort Irwin biologists conducted additional camera trapping surveys June 2–7, 2016. On the morning of June 2, 2016, four motion-activated trail cameras (Reconyx model HC500) were deployed within the Project area. Cameras were securely attached, at a height of approximately one foot above soil surface, to an

engineer stake placed in the ground at a 40-degree angle with the viewfinder targeted on the pile of grain-based "bait". Cameras were set to detect approaching animals for a five-day period, 24 hours per day. Cameras were set to trigger at one-second intervals and take three pictures for each motion capture. Camera sites were replenished with additional grain bait twice during the survey period, with all four cameras being retrieved at approximately 9:00 a.m. on June 7, 2016 (Fort Irwin, 2016a).

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- LEGEND**
- RV Park Expansion
 - RV Park Addition
 - Existing Electrical Line
 - Existing Water Line
 - New Sewage Line
 - New Water Line A
 - New Water Line B
 - Mohave Ground Squirrel (MGS) Camera
 - Trapping Locations

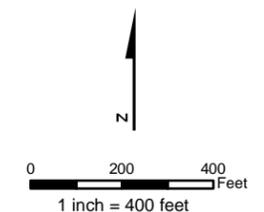


FIGURE 2-1
Project Location Map
and Camera Trapping Locations
 RV Park Expansion Natural Resources Report
 Fort Irwin, California

Source: Esri World World Imagery (Accessed 1/15/16)

SECTION 3

Results

This section provides the results of the natural resources survey and focused desert tortoise survey, including site characteristics, plants, wildlife, and sensitive species.

3.1 Site Characteristics

The Project area has a moderate cover and diversity of plant species (see Appendix A, Photos 1 through 5). The Project survey area ranges in elevation from approximately 2,700 feet (822.96 meters) above mean sea level (amsl) on the western end to approximately 2,800 feet (853.44 meters) amsl on the eastern edge. The site contains a creosote bush (*Larrea tridentata*)-white bursage (*Ambrosia dumosa*)-series vegetation community (Sawyer and Keeler-Wolf, 1995). Creosote bush and white bursage are most common plant species throughout the site, with cheesebush (*Ambrosia salsola*) and paper bag bush (*Scutellaria mexicana*) found to be relatively common on the site. The understory, consisting primarily of Mediterranean grass (*Schismus barbatus*) and redstem filaree (*Erodium cicutarium*), had very little diversity and would not provide valuable wildlife ground forage. Four non-native plant species were observed (Table 3-1), and occurred in small, disparate patches primarily where there is more vehicular traffic. All of the plant species observed are shown in Table 3-1.

A variety of invertebrates, reptiles, birds, and mammals occur within the area. Wildlife observed onsite was typical of that found in the surrounding areas. No fish or amphibious species are likely to inhabit the site or the surrounding areas because no water resources were observed within the Project area. All wildlife and wildlife sign observed onsite and in the surrounding areas are identified in Table 3-1.

TABLE 3-1
Observed Fauna (including sign) and Flora

Common Name	Scientific Name	Federal Status	State Status
Reptiles			
California whiptail	<i>Aspidoscelis tigris munda</i>	N	N
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>	N	N
Side-blotched lizard	<i>Uta stansburiana</i>	N	N
Zebra-tailed lizard	<i>Callisaurus draconoides</i>	N	N
Mammals			
Blacktail jackrabbit	<i>Lepus californicus</i>	N	N
Coyote	<i>Canis latrans</i>	N	N
Desert cottontail	<i>Sylvilagus audubonii</i>	N	N
Desert kangaroo rat	<i>Dipodomys deserti</i>	N	N
Desert pocket mouse	<i>Chaetodipus penicillatus</i>	N	N
Birds			
American robin	<i>Turdus migratorius</i>	N	N
Black-throated sparrow	<i>Amphispiza bilineata</i>	N	N
Common raven	<i>Corvus corax</i>	N	N
Horned lark	<i>Eremophila alpestris</i>	N	N

TABLE 3-1
Observed Fauna (including sign) and Flora

Common Name	Scientific Name	Federal Status	State Status
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	N	N
Plants			
Annual burrweed	<i>Ambrosia acanthicarpa</i>	N	N
Saharan mustard	<i>Brassica tournefortii*</i>	N	N
Buckwheat	<i>Eriogonum fasciculatum</i>	N	N
Brittlebush	<i>Encelia farinosa</i>	N	N
Burrobush	<i>Ambrosia dumosa</i>	N	N
Cheesebush	<i>Ambrosia salsola</i>	N	N
Creosote bush	<i>Larrea tridentata</i>	N	N
Desert trumpet	<i>Eriogonum inflatum</i>	N	N
Mormon tea	<i>Ephedra californica/nevadensis</i>	N	N
Paper bag bush	<i>Scutellaria mexicana</i>	N	N
Redstem filaree	<i>Erodium cicutarium*</i>	N	N
Russian thistle	<i>Salsola tragus*</i>	N	N
Mediterranean grass	<i>Schismus barbatus*</i>	N	N
Wire lettuce	<i>Stephanomeria pauciflora</i>	N	N

N = Not Listed

* = Non-native

Source: Listing status derived from California Department of Fish and Wildlife (2015).

3.2 Camera Trapping Surveys

A summary of the results from the camera trapping surveys are provided in Tables 3-2 and 3-3. Black-tailed jackrabbit (*Lepus californicus*) and kangaroo rats (*Dipodomys* spp.) were the most frequently detected species. Five images of unidentifiable rodents were captured during the April survey period. These rodents are expected to be heteromyids (either kangaroo rats [*Dipodomys* sp.] or pocket mice [*Chaetodipus* sp. or *Perognathus* sp.]) because the photographs were captured while it was dark. Kangaroo rats and pocket mice are nocturnal, and the photographs were outside of the time of day when MGS are active. Representative photographs from the camera trapping survey are provided in Appendix C.

During the first camera trapping survey period (March 21 to 25, 2016), technical issues with the cameras were identified. The camera vendor (TrailCamPro) provided SanDisk Ultra 40 megabytes/s (MB/s) memory cards, which were used during the first survey period. The cameras were not operating properly and the product vendor was contacted. The SanDisk Ultra memory cards are too fast for the Browning Trail Camera Strike Force Elite HD and caused the cameras to malfunction. Therefore, regular SanDisk memory cards were obtained for the second survey period and no additional issues were identified.

TABLE 3-2
Camera Trapping Data Summary for March and April Surveys

Common Name	Scientific Name	Station 1 (S1)	Station 2 (S2)	Station 3 (S3)	Station 4 (S4)	Station 5 (S5)	Station 6 (S6)	Station 7 (S7)	Station 8 (S8)	Station 9 (S9)	Species Total
Birds											
Burrowing owl	<i>Athene cunicularia</i>	0	1	0	0	0	0	0	0	0	1
Horned lark	<i>Eremophila alpestris</i>	0	0	0	0	2	0	0	0	0	2
Mammals											
Black-tailed jackrabbit	<i>Lepus californicus</i>	77	58	38	51	26	34	43	66	87	480
Coyote	<i>Canis latrans</i>	0	0	0	0	1	1	0	0	0	2
Domestic cat	<i>Felis catus</i>	2	0	0	1	0	2	0	0	0	5
Domestic dog	<i>Canis lupus familiaris</i>	0	0	0	0	0	1	0	0	0	1
Kangaroo rat	<i>Dipodomys sp.</i>	8	33	8	3	8	4	33	7	2	106
Pocket mouse	<i>Chaetodipus sp.</i>	0	14	1	0	6	0	1	0	0	22
Unidentifiable rodent	<i>Rodentia</i>	1	0	0	0	0	0	3	1	0	5
White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	0	0	5	0	4	0	0	3	0	12
Total Abundance		88	106	52	55	47	42	80	77	89	636

TABLE 3-3
Camera Trapping Data for June Survey

Station ID	Date	Species Detected
RV-01	2 June 2016	None
	3 June	antelope ground squirrel, harvester ants, desert pocket mouse
	4 June	desert kangaroo rat, antelope ground squirrel,
	5 June	desert pocket mice, desert kangaroo rat, jackrabbit
	6 June	jackrabbit, antelope ground squirrel
	7 June	None
	RV-02	2 June 2016
3 June		antelope ground squirrel, jackrabbit, desert pocket mice
4 June		desert kangaroo rat, antelope ground squirrel,
5 June		antelope ground squirrel, jackrabbit, darkling beetle
6 June		jackrabbit, antelope ground squirrel
7 June		jackrabbit, desert pocket mice, antelope ground squirrel

TABLE 3-3
Camera Trapping Data for June Survey

Station ID	Date	Species Detected
RV-03	2 June 2016	antelope ground squirrel, jackrabbit
	3 June	jackrabbit, desert pocket mouse
	4 June	jackrabbit, desert pocket mice, antelope ground squirrel,
	5 June	antelope ground squirrel, jackrabbit
	6 June	None
	7 June	None
	RV-04	2 June 2016
3 June		antelope ground squirrel, jackrabbit, harvester ants, desert woodrat
4 June		None
5 June		antelope ground squirrel, desert k-rat, Merriam's k-rat, desert iguana
6 June		jackrabbit, antelope ground squirrel
7 June		jackrabbit, antelope ground squirrel

Source: Fort Irwin, 2016a

3.3 Sensitive Species

Five sensitive species (one plant and four animals) were specifically targeted during the natural resources survey due to historical records and suitable habitat in the Project vicinity (California Native Plant Society [CNPS], 2016). Fort Irwin Sensitive Species Sightings Databases were searched and mapped with one-mile buffer occurrences of live desert tortoise, desert tortoise carcass, burrowing owl, and Mohave ground squirrel (Figure 3-1).

Clokey's Cryptantha

Clokey's cryptantha (*Cryptantha clokeyi*) is a CNPS List 1B.2 annual herb that blooms in April. It is known to occur in desert habitat generally including sandy or gravelly soils within creosote bush scrub communities in the Mojave Desert from elevations of 2,625 feet (800.1 meters) to 4,200 feet (1,280.16 meters) amsl. This plant was not observed during the natural resource survey.

Desert Tortoise

A description of the desert tortoise is presented in Section 3.3.1.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is a California Species of Concern and is protected by the Migratory Bird Treaty Act (MBTA). This species is relatively common in lowland California and prefers open habitat with scattered shrubs and trees for nesting (Grinnel and Miller, 1944). Marginally suitable foraging habitat for this species occurs within the Project area. Suitable nesting habitat is very rare. No loggerhead shrikes were observed onsite during the survey; however, there is a moderate potential for the species to occur, as marginally suitable foraging habitat is present and loggerhead shrikes have been observed in the nearby area.

Mohave Ground Squirrel

The Mohave ground squirrel (*Xerospermophilus mohavensis*) is a California state-listed threatened species restricted to the Mojave Desert in San Bernardino, Los Angeles, Kern, and Inyo counties. This species favors open desert scrub, alkali desert scrub, and Joshua tree habitats at elevations ranging from 1,800 feet (548.64 meters) to 5,000 feet (1,524 meters) amsl. It is also known to feed in annual grasslands. The nearest Mohave ground squirrel population is four miles northwest of the Project area within the NASA/Goldstone complex. Populations of this species have not been observed east of this western-most population since the 1980s (Fort Irwin, 2015). The nearest Mohave ground squirrel individual was observed approximately four miles northwest of the Project area in 1987 in the NASA/Goldstone complex (Fort Irwin, 2016b). This species was not observed during the natural resource survey or detected during the camera trapping survey. The MGS habitat at the Project area is considered low quality given the vegetation present and the fact that the area of suitable habitat is relatively small, isolated, and impacted by continual human disturbance.

Western Burrowing Owl

The western burrowing owl (*Athene cunicularia*) is a California Species of Concern and is protected by the MBTA. This ground-nesting raptor occupies burrows in annual grassland or ruderal habitats. It is historically known to occur in open, dry grasslands, agricultural and range lands, and desert habitats. There have been four sightings of this species within a one-mile buffer around the Project area based on historical geographic information system (GIS) data collected by Fort Irwin. The most recent previous sighting was on July 8, 2011, which was approximately 0.3 mile (0.48 kilometer) west of the Project area (Fort Irwin, 2016c). Neither this species nor its sign were observed on the Project site during the pedestrian surveys. However, this species was documented during camera trapping at Station 2 (Appendix C, Photograph 5).

3.3.1 Desert Tortoise

Desert tortoises were classified by USFWS as a threatened species in 1990. This listing occurred as a result of continued human-caused habitat destruction through urban expansion, off-road vehicle use, illegal collection for the pet trade, and raven predation on juvenile tortoises.

The desert tortoise is threatened in over 30 percent of its range. Desert tortoises occur in southeastern California, southern Nevada, southwestern Utah, and northwestern Arizona, often within desert scrub communities. Optimal habitat for the desert tortoise has been characterized as creosote bush scrub where annual precipitation ranges from two to eight inches (5.08 to 20.32 centimeters), where a diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach, 1982; Turner, 1982; Turner and Brown, 1982). Soils must be friable enough for digging burrows, but firm enough so that burrows do not collapse. Desert tortoises occur from below sea level to an elevation of 7,300 feet (2,225.04 meters) amsl, but the most favorable habitat occurs at elevations of approximately 1,000 feet (304.8 meters) to 3,000 feet (914.4 meters) amsl (Luckenbach, 1982). Throughout most of the Mojave region, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils, scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range; however, tortoises can be found in steeper, rockier areas (Gardner and Brodie, 2000).

The desert tortoise is well studied at Fort Irwin, with the distribution and estimated sizes of populations documented throughout the installation. The desert tortoise occurs throughout Fort Irwin in low numbers, with the highest concentration along the southern boundary (Army, 2006). Historical Fort Irwin GIS data of live and dead desert tortoise occurrences ranging from 1994 to 2015 indicate that 19 live and six dead desert tortoises were observed within a one-mile buffer of the Project area during this period (Fort Irwin, 2016d). The most recent sighting of a desert tortoise within the one-mile buffer was on April 23, 2011, approximately one mile east of the Project area along Goldstone Road. On August 23, 2005, a desert tortoise carcass was found in the RV parking lot. No desert tortoises, their burrows, or sign of desert tortoise was observed during the surveys on the Project site.

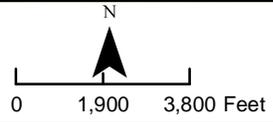
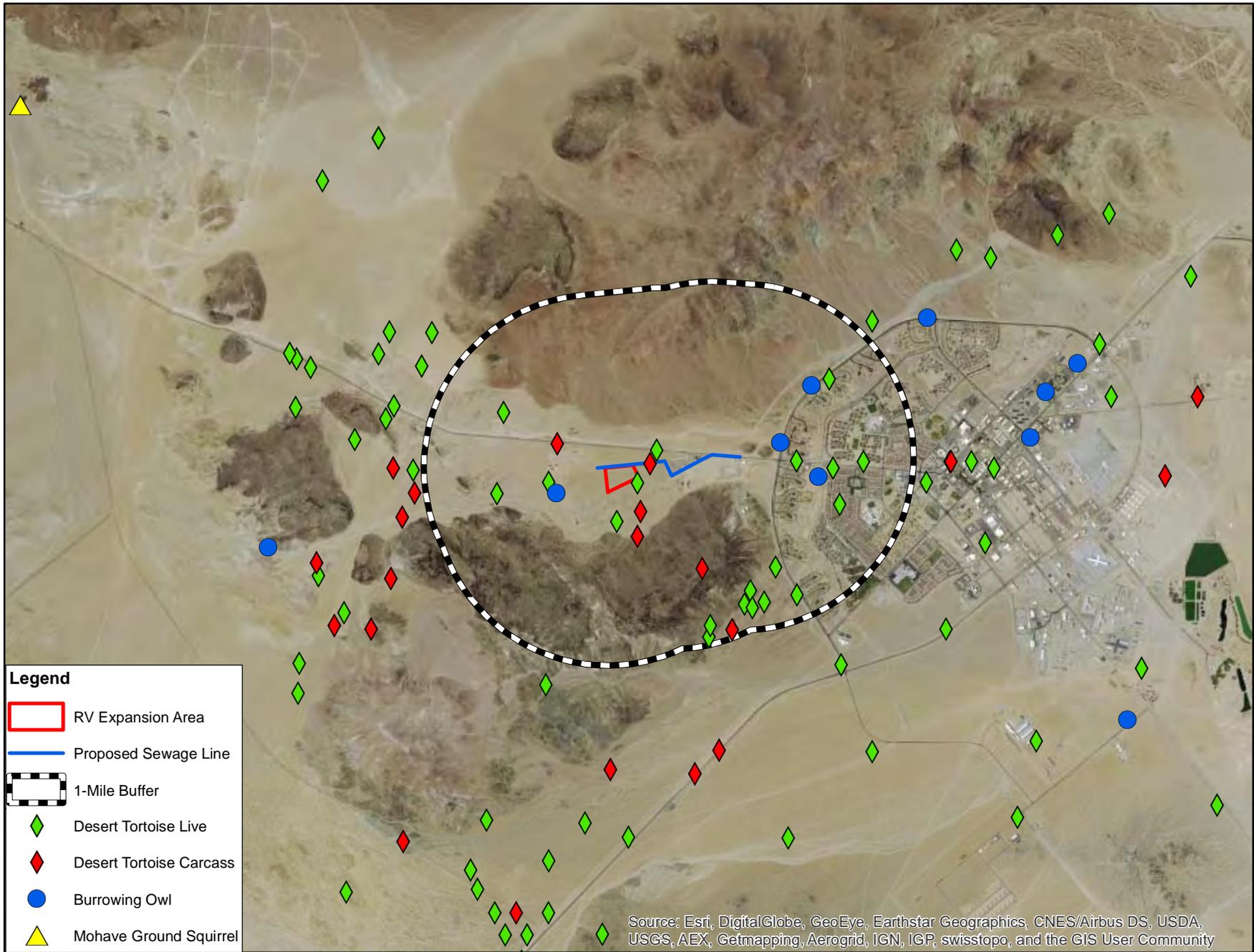


Figure 3-1
 Sensitive Species Sign
 RV Park Expansion Natural Resources Report
 Fort Irwin, CA **CH2MHILL**

SECTION 4

Conclusions and Recommendations

This section identifies the biological resources on the Project site for which further surveys or permitting may be required. This section also presents recommendations for meeting the requirements for these resources.

4.1 Conclusions

No federally listed or state-listed wildlife species or sign of the species were observed during the pedestrian field surveys. A burrowing owl was captured on one of the game cameras. No suitable breeding habitat was observed within the Project area and no burrowing owl burrows were observed during the pedestrian survey of the area; so it is likely the burrowing owl was using the site to forage. No other federally listed or state-listed wildlife species were identified through camera trapping.

One California Species of Concern wildlife species has a moderate potential to occur onsite:

- Loggerhead shrike

4.2 Recommendations

Conduct pre-construction nesting bird surveys no more than two days prior to the initiation of vegetation removal activities on the site. These surveys consist of walking 98-foot (30-meter) transects throughout the Project area during the bird breeding season (February 1 to August 31) to identify any nesting birds currently inhabiting areas where Project activities may disturb their nests (CalPIF, 2009).

SECTION 5

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Appendix A
Project Site Photographs



Photograph 1: View of RV Park Expansion area from the western boundary of the RV Park Addition area, looking northeast.



Photograph 2: View of the RV Park Expansion area from the eastern boundary of the RV Park Addition area, looking southwest.



Photograph 3: View of the RV Park Expansion area from the northwestern corner of the RV Park Addition area, looking east.



Photograph 4: View of the RV Park Expansion area from the northeastern corner of the RV Park Addition area, looking west.



Photograph 5: View of the RV Park Expansion area from the southwestern corner of the RV Park Addition area, looking northeast.

Appendix B
Camera Trapping Data

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S1	154	3/22/2016	21:23	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	156	3/23/2016	0:39	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S1	157	3/23/2016	2:59	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	162	3/23/2016	23:51	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	163	3/24/2016	0:09	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S1	167	3/24/2016	1:36	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	170	3/24/2016	3:32	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	171	3/24/2016	3:53	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	3 images
S1	5	4/5/2016	1:52	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S1	12	4/5/2016	2:21	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S1	23	4/5/2016	2:38	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	25	4/5/2016	2:48	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	9 images
S1	34	4/5/2016	3:13	54	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S1	34	4/5/2016	3:13	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	49 images
S1	48	4/5/2016	3:31	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	50	4/5/2016	3:33	54	UNRO	Unidentifiable rodent	None	1	Most likely <i>Dipodomys sp.</i>
S1	51	4/5/2016	3:34	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S1	54	4/5/2016	3:38	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S1	60	4/5/2016	3:44	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S1	65	4/5/2016	3:50	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	67	4/5/2016	3:52	54	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S1	68	4/5/2016	3:53	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	69	4/5/2016	3:55	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	71	4/5/2016	3:59	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	83	4/5/2016	4:27	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S1	89	4/5/2016	4:58	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	91	4/5/2016	5:49	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S1	125	4/5/2016	21:28	70	DOCA	Domestic cat	<i>Felis catus</i>	1	None
S1	126	4/5/2016	21:33	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	128	4/5/2016	21:47	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S1	131	4/5/2016	21:59	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	132	4/5/2016	22:04	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	134	4/5/2016	23:26	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S1	142	4/5/2016	23:46	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	3	7 images
S1	149	4/6/2016	0:01	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S1	157	4/6/2016	0:28	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	159	4/6/2016	1:51	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	11 images
S1	161	4/6/2016	1:53	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S1	170	4/6/2016	2:15	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S1	173	4/6/2016	2:22	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	175	4/6/2016	2:33	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S1	176	4/6/2016	2:34	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	183	4/6/2016	2:47	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	8 images
S1	191	4/6/2016	3:08	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S1	196	4/6/2016	3:31	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	13 images
S1	209	4/6/2016	3:51	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S1	210	4/6/2016	4:10	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	19 images
S1	220	4/6/2016	4:22	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	225	4/6/2016	4:28	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	229	4/6/2016	5:16	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	15 images
S1	244	4/6/2016	5:41	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S1	251	4/6/2016	6:07	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S1	272	4/6/2016	19:45	77	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	274	4/6/2016	20:04	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	275	4/6/2016	22:28	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S1	278	4/6/2016	22:41	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	279	4/6/2016	23:42	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	13 images
S1	285	4/6/2016	23:51	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	292	4/7/2016	0:09	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	22 images
S1	298	4/7/2016	0:15	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	12 images
S1	314	4/7/2016	0:54	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S1	316	4/7/2016	0:57	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	320	4/7/2016	1:39	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	322	4/7/2016	2:01	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S1	323	4/7/2016	2:10	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	38 images
S1	324	4/7/2016	2:11	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S1	330	4/7/2016	2:17	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	2 images
S1	337	4/7/2016	2:25	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S1	348	4/7/2016	2:36	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S1	353	4/7/2016	2:42	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	3 images
S1	362	4/7/2016	3:07	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S1	363	4/7/2016	3:09	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S1	367	4/7/2016	3:09	59	DOCA	Domestic cat	<i>Felis catus</i>	1	None
S1	368	4/7/2016	3:30	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	46 images
S1	370	4/7/2016	3:32	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	26 images
S1	371	4/7/2016	3:33	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S1	384	4/7/2016	3:47	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S1	387	4/7/2016	3:51	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S1	408	4/7/2016	4:19	59	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S1	413	4/7/2016	4:31	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S1	415	4/7/2016	4:36	61	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	2 images
S1	420	4/7/2016	5:29	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	173	3/22/2016	0:43	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	205	3/22/2016	21:29	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	206	3/22/2016	22:54	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	208	3/22/2016	23:16	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	211	3/23/2016	0:20	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	212	3/23/2016	0:51	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	214	3/23/2016	0:58	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	218	3/23/2016	2:28	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	219	3/23/2016	5:04	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S2	220	3/23/2016	5:05	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S2	224	3/23/2016	6:19	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	225	3/23/2016	6:34	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	227	3/23/2016	7:09	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	5 images
S2	232	3/23/2016	19:21	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	233	3/23/2016	19:33	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	235	3/23/2016	21:20	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	237	3/23/2016	21:33	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	239	3/24/2016	1:00	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	19 images
S2	250	3/24/2016	1:10	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S2	258	3/24/2016	3:12	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	260	3/24/2016	3:19	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	261	3/24/2016	3:20	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	262	3/24/2016	4:07	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	265	3/24/2016	4:16	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	267	3/24/2016	4:29	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	269	3/24/2016	4:34	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	271	3/24/2016	5:36	38	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	272	3/24/2016	6:05	36	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	62	4/4/2016	21:26	63	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	4 images
S2	70	4/4/2016	21:42	63	ATCU	Burrowing owl	<i>Athene cunicularia</i>	1	None
S2	74	4/4/2016	21:46	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	84	4/4/2016	22:41	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	3 images
S2	91	4/4/2016	22:59	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	94	4/4/2016	23:08	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S2	102	4/4/2016	23:17	63	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	3 images
S2	106	4/4/2016	23:29	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	107	4/4/2016	23:30	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	108	4/4/2016	23:33	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	109	4/4/2016	23:43	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	112	4/4/2016	23:49	61	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	114	4/4/2016	23:52	61	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	120	4/5/2016	0:01	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	121	4/5/2016	0:02	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S2	121	4/5/2016	0:02	61	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	2 images
S2	127	4/5/2016	0:09	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	130	4/5/2016	0:13	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	132	4/5/2016	0:15	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	4 images
S2	138	4/5/2016	0:23	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	141	4/5/2016	0:27	59	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	3 images
S2	144	4/5/2016	0:33	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	8 images
S2	162	4/5/2016	1:25	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	12 images
S2	178	4/5/2016	2:06	54	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	179	4/5/2016	2:08	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	182	4/5/2016	2:22	54	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	186	4/5/2016	2:30	54	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	194	4/5/2016	2:45	54	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	5 images

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S2	200	4/5/2016	2:55	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	225	4/5/2016	3:52	54	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	3 images
S2	243	4/5/2016	5:00	50	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	335	4/5/2016	19:49	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	15 images
S2	341	4/5/2016	19:57	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	355	4/5/2016	20:29	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	13 images
S2	356	4/5/2016	20:30	68	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	380	4/5/2016	21:23	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S2	393	4/5/2016	21:59	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S2	401	4/5/2016	22:18	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	403	4/5/2016	22:32	68	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	2 images
S2	405	4/5/2016	22:40	68	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	405	4/5/2016	22:40	68	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	406	4/5/2016	22:47	68	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	408	4/5/2016	22:56	68	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	413	4/5/2016	23:08	68	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	5 images
S2	418	4/6/2016	23:20	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	419	4/6/2016	0:03	68	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	420	4/6/2016	0:14	68	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	421	4/6/2016	0:15	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	423	4/6/2016	0:27	68	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	2	3 images
S2	441	4/6/2016	3:31	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	444	4/6/2016	3:34	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	452	4/6/2016	4:04	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	464	4/6/2016	5:20	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	487	4/6/2016	19:43	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	15 images
S2	491	4/6/2016	19:48	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S2	495	4/6/2016	19:52	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	502	4/6/2016	21:11	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	11 images
S2	507	4/6/2016	21:21	63	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	510	4/6/2016	21:25	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	515	4/6/2016	22:00	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	5 images
S2	521	4/6/2016	22:38	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	522	4/6/2016	23:05	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	3	None
S2	523	4/6/2016	23:26	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	524	4/6/2016	23:29	59	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S2	525	4/6/2016	23:48	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S2	526	4/7/2016	0:29	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	528	4/7/2016	1:37	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	534	4/7/2016	1:45	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S2	537	4/7/2016	2:05	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S2	539	4/7/2016	3:56	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	542	4/7/2016	4:11	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S2	549	4/7/2016	5:25	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S2	555	4/7/2016	6:02	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	8	3/21/2016	19:57	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S3	10	3/21/2016	21:27	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	11	3/21/2016	22:43	52	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	13	3/21/2016	0:50	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	21	3/22/2016	22:35	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	26	3/23/2016	22:01	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	27	3/24/2016	0:08	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	2	4/4/2016	21:16	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S3	7	4/4/2016	21:50	65	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S3	8	4/4/2016	21:51	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S3	15	4/4/2016	22:03	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S3	18	4/4/2016	22:12	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S3	21	4/4/2016	22:33	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S3	24	4/4/2016	23:46	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	25	4/4/2016	23:52	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S3	31	4/5/2016	5:11	52	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	32	4/5/2016	5:21	32	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	34	4/5/2016	11:30	101	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S3	35	4/5/2016	12:03	106	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S3	50	4/5/2016	19:44	74	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S3	61	4/6/2016	12:16	61	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S3	69	4/6/2016	14:33	101	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	2 images
S3	71	4/6/2016	16:05	99	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S3	73	4/6/2016	19:46	74	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	14 images
S3	77	4/6/2016	19:52	74	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S3	88	4/6/2016	20:16	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S3	90	4/6/2016	20:30	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	13 images
S3	91	4/6/2016	20:32	70	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S3	96	4/6/2016	20:38	70	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	2 images
S3	98	4/6/2016	20:40	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	13 images
S3	112	4/6/2016	21:18	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S3	114	4/6/2016	21:56	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S3	116	4/6/2016	21:58	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	119	4/6/2016	22:03	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	16 images
S3	121	4/6/2016	22:09	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S3	121	4/6/2016	22:09	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	3 images
S3	135	4/6/2016	22:33	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	32 images
S3	139	4/6/2016	22:37	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S3	144	4/6/2016	22:44	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S3	152	4/6/2016	22:58	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	170	4/6/2016	23:30	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S3	180	4/6/2016	0:05	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	181	4/7/2016	0:15	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S3	183	4/7/2016	0:28	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	9 images
S3	188	4/7/2016	0:34	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	3 images
S3	188	4/7/2016	0:34	63	CHSP	Pocket mouse	<i>Chaetodipus sp.</i>	1	2 images
S3	192	4/7/2016	1:13	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S3	195	4/7/2016	2:47	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S3	203	4/7/2016	3:31	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S3	208	4/7/2016	4:04	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S3	211	4/7/2016	4:35	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S3	214	4/7/2016	5:41	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S4	5	3/22/2016	1:53	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	6	3/22/2016	4:04	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S4	9	3/22/2016	5:53	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	12	3/22/2016	20:06	52	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	14	3/22/2016	21:30	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	3 images
S4	19	3/22/2016	23:32	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	20	3/23/2016	2:31	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	21	3/23/2016	3:12	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	22	3/23/2016	4:02	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S4	25	3/23/2016	5:21	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S4	28	3/23/2016	5:37	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	29	3/23/2016	6:00	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	30	3/23/2016	6:28	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	32	3/23/2016	7:19	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	33	3/23/2016	20:21	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S4	36	3/23/2016	20:55	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	38	3/23/2016	21:11	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S4	41	3/23/2016	21:54	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	42	3/23/2016	22:03	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	43	3/23/2016	22:18	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	44	3/23/2016	22:36	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S4	45	3/23/2016	22:39	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	46	3/24/2016	1:33	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S4	49	3/24/2016	4:22	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	50	3/24/2016	4:30	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	51	3/24/2016	5:02	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	52	3/24/2016	5:15	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S4	54	3/24/2016	6:02	36	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	55	3/24/2016	6:21	36	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	2	4/4/2016	21:39	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	3	4/4/2016	22:54	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	3	4/4/2016	22:54	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S4	4	4/5/2016	0:04	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	4	4/5/2016	0:04	59	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S4	5	4/5/2016	1:56	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	6	4/5/2016	4:26	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	8	4/5/2016	5:47	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	29	4/5/2016	20:40	68	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S4	31	4/5/2016	22:50	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S4	34	4/6/2016	1:20	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S4	35	4/6/2016	1:43	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S4	36	4/6/2016	2:26	65	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	37	4/6/2016	5:13	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	42	4/6/2016	18:38	83	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S4	47	4/6/2016	18:52	81	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	49	4/6/2016	19:05	81	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S4	54	4/6/2016	21:45	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S4	58	4/6/2016	22:51	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	60	4/6/2016	23:23	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	61	4/6/2016	23:46	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S4	63	4/7/2016	1:35	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	64	4/7/2016	4:14	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S4	65	4/7/2016	5:14	59	DOCA	Domestic cat	<i>Felis catus</i>	1	None
S5	6	3/21/2016	21:19	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	16	3/24/2016	3:56	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	17	3/24/2016	6:29	36	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	2	4/4/2016	20:25	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	3	4/4/2016	21:02	68	CALA	Coyote	<i>Canis latrans</i>	1	None
S5	6	4/5/2016	5:34	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	7	4/5/2016	5:55	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	8	4/5/2016	6:50	47	ERAL	Horned lark	<i>Eremophila alpestris</i>	1	None
S5	47	4/5/2016	10:03	101	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S5	69	4/5/2016	14:37	101	ERAL	Horned lark	<i>Eremophila alpestris</i>	1	None
S5	71	4/5/2016	14:43	101	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S5	81	4/5/2016	19:45	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S5	87	4/5/2016	21:51	70	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	7 images
S5	98	4/5/2016	22:48	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S5	101	4/5/2016	23:01	70	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S5	102	4/5/2016	23:03	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S5	104	4/5/2016	23:19	68	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	3 images
S5	110	4/5/2016	23:38	68	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S5	112	4/5/2016	23:45	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S5	115	4/5/2016	23:48	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	4 images
S5	119	4/6/2016	0:02	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	3 images
S5	122	4/6/2016	0:13	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S5	125	4/6/2016	0:38	70	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S5	126	4/6/2016	0:43	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S5	128	4/6/2016	1:06	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S5	159	4/6/2016	12:03	99	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S5	169	4/6/2016	15:28	99	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S5	170	4/6/2016	19:43	74	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S5	172	4/6/2016	19:45	74	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	180	4/6/2016	20:43	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S5	184	4/6/2016	21:44	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	187	4/6/2016	21:57	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	11 images
S5	198	4/6/2016	22:14	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	19 images
S5	199	4/6/2016	22:15	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S5	205	4/6/2016	22:22	63	CHSP	Pocket mouse	<i>Chaetodipus</i> sp.	1	None
S5	206	4/6/2016	22:23	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	211	4/6/2016	22:30	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	214	4/6/2016	22:37	61	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S5	219	4/6/2016	23:05	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S5	224	4/6/2016	23:16	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	225	4/6/2016	23:21	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	226	4/6/2016	23:44	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S5	230	4/6/2016	0:35	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S5	233	4/6/2016	0:55	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S5	237	4/6/2016	1:24	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S5	240	4/6/2016	1:32	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S5	242	4/6/2016	5:16	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S6	5	3/21/2016	15:39	79	DODO	Domestic dog	<i>Canis lupus familiaris</i>	1	None
S6	7	3/22/2016	3:03	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	17	3/24/2016	1:03	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	18	3/24/2016	4:53	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	2	4/5/2016	0:13	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S6	4	4/5/2016	0:19	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S6	8	4/5/2016	0:32	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S6	9	4/5/2016	1:46	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	10	4/5/2016	4:59	52	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S6	13	4/5/2016	6:39	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S6	16	4/5/2016	22:39	70	CALA	Coyote	<i>Canis latrans</i>	1	None
S6	17	4/5/2016	23:18	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S6	21	4/5/2016	23:28	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S6	23	4/5/2016	23:31	70	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S6	27	4/6/2016	0:15	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	28	4/6/2016	0:23	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	5 images
S6	33	4/6/2016	0:33	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S6	34	4/6/2016	0:43	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	35	4/6/2016	2:59	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S6	36	4/6/2016	3:08	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	18 images
S6	53	4/6/2016	3:35	63	DOCA	Domestic cat	<i>Felis catus</i>	1	None
S6	54	4/6/2016	4:03	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S6	62	4/6/2016	4:12	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S6	65	4/6/2016	21:32	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S6	68	4/6/2016	21:44	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S6	70	4/6/2016	21:49	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	74	4/6/2016	22:42	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	9 images
S6	83	4/7/2016	1:27	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	11 images
S6	87	4/7/2016	1:33	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S6	94	4/7/2016	2:14	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S6	99	4/7/2016	2:35	63	DOCA	Domestic cat	<i>Felis catus</i>	1	None
S6	100	4/7/2016	2:51	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S6	104	4/7/2016	2:58	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S6	105	4/7/2016	3:15	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	9 images
S6	106	4/7/2016	3:17	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S6	114	4/7/2016	3:40	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	12 images
S6	127	4/7/2016	4:05	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	4 images
S6	131	4/7/2016	4:26	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	6	3/21/2016	19:35	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	9	3/22/2016	0:43	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	10	3/22/2016	0:51	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	11	3/22/2016	3:03	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	18	3/22/2016	19:18	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	19	3/22/2016	22:28	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	21	3/22/2016	23:20	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	22	3/23/2016	0:19	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	26	3/23/2016	6:02	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	27	3/23/2016	6:07	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	27	3/23/2016	6:07	43	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	28	3/24/2016	5:12	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	29	3/24/2016	5:31	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	68	4/4/2016	21:15	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S7	119	4/4/2016	23:55	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	121	4/4/2016	23:58	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	132	4/5/2016	0:12	61	UNRO	Unidentifiable rodent	None	1	Most likely k-rat, image too blurry
S7	151	4/5/2016	1:03	59	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	176	4/5/2016	2:29	56	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	180	4/5/2016	2:35	56	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	224	4/5/2016	4:01	54	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	238	4/5/2016	4:19	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	351	4/5/2016	19:50	74	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	368	4/5/2016	20:30	70	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	2 images
S7	373	4/5/2016	20:40	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	5 images
S7	386	4/5/2016	21:01	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	402	4/5/2016	21:09	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	3 images
S7	410	4/5/2016	21:29	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	3 images
S7	412	4/5/2016	21:32	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	417	4/5/2016	21:39	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	423	4/5/2016	21:50	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	425	4/5/2016	21:53	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	17 images
S7	434	4/5/2016	22:05	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	452	4/5/2016	22:32	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	455	4/5/2016	22:35	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S7	472	4/5/2016	22:59	72	CHSP	Pocket mouse	<i>Chaetodipus sp.</i>	1	5 images
S7	485	4/5/2016	23:18	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S7	493	4/5/2016	23:28	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	3 images
S7	501	4/5/2016	23:39	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	4 images
S7	512	4/5/2016	23:54	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	2 images
S7	526	4/6/2016	0:21	72	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S7	530	4/6/2016	0:28	72	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S7	531	4/6/2016	0:30	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S7	537	4/6/2016	0:41	72	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	4 images
S7	545	4/6/2016	0:55	72	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S7	561	4/6/2016	1:23	72	UNRO	Unidentifiable rodent	None	1	2 images
S7	566	4/6/2016	1:31	72	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	4 images
S7	581	4/6/2016	2:39	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	609	4/6/2016	4:05	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S7	639	4/6/2016	5:22	65	UNRO	Unidentifiable rodent	None	1	Most likely k-rat
S7	642	4/6/2016	5:29	65	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S7	723	4/6/2016	19:11	81	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	725	4/6/2016	19:20	79	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S7	731	4/6/2016	19:41	77	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	733	4/6/2016	20:00	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	734	4/6/2016	20:06	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	741	4/6/2016	22:04	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S7	743	4/6/2016	22:09	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S7	748	4/6/2016	22:22	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	750	4/6/2016	22:32	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S7	757	4/6/2016	22:45	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	758	4/6/2016	23:04	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	760	4/6/2016	23:20	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	761	4/6/2016	23:42	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	763	4/6/2016	23:53	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	765	4/7/2016	0:00	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	766	4/7/2016	0:06	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S7	770	4/7/2016	0:37	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	776	4/7/2016	1:13	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S7	784	4/7/2016	1:43	63	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	2 images
S7	797	4/7/2016	2:17	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S7	801	4/7/2016	2:43	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	802	4/7/2016	2:40	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	806	4/7/2016	2:54	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S7	807	4/7/2016	2:55	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	811	4/7/2016	3:01	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S7	816	4/7/2016	3:41	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S7	818	4/7/2016	3:52	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S7	821	4/7/2016	4:12	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S7	827	4/7/2016	4:28	59	DISP	Kangaroo rat	<i>Dipodomys</i> sp.	1	None
S8	19	3/21/2016	19:25	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	21	3/21/2016	22:07	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	23	3/21/2016	23:48	50	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S8	25	3/22/2016	2:07	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	26	3/22/2016	3:44	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	27	3/22/2016	4:19	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S8	33	3/22/2016	4:43	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S8	35	3/22/2016	4:57	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	37	3/22/2016	5:12	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S8	38	3/22/2016	5:44	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S8	46	3/22/2016	16:10	68	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S8	47	3/22/2016	19:23	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	49	3/22/2016	19:31	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	50	3/22/2016	19:39	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	52	3/22/2016	20:42	50	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	55	3/22/2016	20:55	50	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	59	3/22/2016	21:16	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	61	3/22/2016	22:56	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	62	3/22/2016	23:11	41	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S8	70	3/22/2016	23:49	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	6 images
S8	76	3/23/2016	0:04	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	78	3/23/2016	1:18	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	80	3/23/2016	1:52	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	5 images
S8	86	3/23/2016	3:15	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	87	3/23/2016	3:48	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	89	3/23/2016	5:26	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	91	3/23/2016	5:37	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	3	3 images
S8	94	3/23/2016	5:54	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	96	3/23/2016	19:25	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	97	3/23/2016	19:56	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	99	3/23/2016	21:50	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	100	3/23/2016	21:58	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	103	3/23/2016	23:38	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	5 images
S8	109	3/24/2016	0:18	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	110	3/24/2016	0:42	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	111	3/24/2016	2:24	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	112	3/24/2016	2:56	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	113	3/24/2016	3:02	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	114	3/24/2016	3:26	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S8	116	3/24/2016	3:41	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	3	4/4/2016	20:01	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	5	4/4/2016	21:35	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	6	4/4/2016	22:38	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	9	4/4/2016	22:51	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	10 images
S8	11	4/4/2016	22:54	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	19	4/4/2016	23:58	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	20	4/5/2016	0:01	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	19 images
S8	25	4/5/2016	0:12	61	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	39	4/5/2016	1:07	59	UNRO	Unidentifiable rodent	None	1	None
S8	40	4/5/2016	1:11	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	43	4/5/2016	2:24	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	45	4/5/2016	4:03	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	46	4/5/2016	4:53	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S8	48	4/5/2016	5:33	47	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	53	4/5/2016	17:08	53	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S8	54	4/5/2016	20:36	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	56	4/5/2016	20:39	68	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	58	4/5/2016	21:23	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	61	4/5/2016	21:40	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S8	65	4/5/2016	22:10	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	66	4/5/2016	23:36	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S8	69	4/6/2016	0:11	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S8	69	4/6/2016	0:11	70	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	74	4/6/2016	0:19	70	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	75	4/6/2016	1:01	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S8	77	4/6/2016	4:10	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	None
S8	78	4/6/2016	4:14	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S8	79	4/6/2016	9:16	81	AMLE	White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	1	None
S9	7	3/22/2016	3:09	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	12	3/22/2016	20:53	50	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S9	13	3/22/2016	20:56	50	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	14	3/22/2016	23:25	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	15	3/23/2016	0:49	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S9	16	3/23/2016	2:39	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	17	3/23/2016	2:41	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	18	3/23/2016	3:14	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	9 images
S9	19	3/23/2016	3:15	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	20	3/23/2016	3:18	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	25	3/23/2016	3:27	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	27	3/23/2016	3:38	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	3	None
S9	28	3/23/2016	3:46	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	3	None
S9	29	3/23/2016	3:53	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S9	31	3/23/2016	4:10	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	32	3/23/2016	4:44	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	3 images
S9	35	3/23/2016	4:59	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S9	36	3/23/2016	5:11	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S9	37	3/23/2016	5:13	43	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	38	3/23/2016	5:42	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	50	3/23/2016	19:48	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	52	3/23/2016	21:11	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	5 images
S9	56	3/23/2016	21:22	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	57	3/23/2016	23:10	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	58	3/24/2016	0:14	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	60	3/24/2016	0:23	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	63	3/24/2016	1:14	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S9	64	3/24/2016	1:20	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S9	65	3/24/2016	2:06	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	67	3/24/2016	2:47	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	2 images
S9	69	3/24/2016	2:59	45	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None

Camera Trapping Survey Data

Station ID	Photo Number	Date	Time	Temperature (°F)	Species Code	Common Name	Scientific Name	Number of Individuals	Comments
S9	3	4/4/2016	19:55	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	13	4/4/2016	22:53	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	None
S9	15	4/4/2016	23:36	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S9	19	4/5/2016	1:10	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	20	4/5/2016	1:25	59	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	22	4/5/2016	1:37	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	25	4/5/2016	1:52	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	27	4/5/2016	2:05	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S9	29	4/5/2016	2:08	56	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	33	4/5/2016	2:28	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	35	4/5/2016	2:46	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	20 images
S9	51	4/5/2016	3:21	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	55	4/5/2016	3:33	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	57	4/5/2016	3:44	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	60	4/5/2016	3:56	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	62	4/5/2016	4:11	54	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	126	4/5/2016	19:59	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	135	4/5/2016	20:58	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	137	4/5/2016	21:06	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	143	4/5/2016	21:20	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	8 images
S9	155	4/5/2016	21:44	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	22 images
S9	158	4/5/2016	21:47	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	165	4/5/2016	21:55	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	175	4/5/2016	22:07	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	190	4/5/2016	22:36	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	197	4/5/2016	22:57	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	38 images
S9	208	4/5/2016	23:14	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	239	4/5/2016	23:56	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	243	4/6/2016	0:02	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S9	250	4/6/2016	0:21	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	251	4/6/2016	0:23	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	258	4/6/2016	0:44	72	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	2	3 images
S9	263	4/6/2016	1:14	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	4 images
S9	267	4/6/2016	1:25	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	7 images
S9	270	4/6/2016	1:30	70	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	2 images
S9	274	4/6/2016	1:44	68	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	3 images
S9	279	4/6/2016	3:51	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	24 images
S9	306	4/6/2016	4:23	61	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	312	4/6/2016	4:55	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	6 images
S9	314	4/6/2016	4:58	63	LECA	Black-tailed jackrabbit	<i>Lepus californicus</i>	1	None
S9	318	4/6/2016	5:28	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	2 images
S9	320	4/6/2016	5:47	63	DISP	Kangaroo rat	<i>Dipodomys sp.</i>	1	7 images

Appendix C
Camera Trapping Survey Photographs



Photograph 1. Black-tailed jackrabbit (*Lepus californicus*) at Station 1 (S1). Taken: 4/5/2016.



Photograph 2. Kangaroo rat (*Dipodomys* sp.) at S1. Taken: 4/5/2016.



Photograph 3. Black-tailed jackrabbits at S1. Taken: 4/5/2016.



Photograph 4. Black-tailed jackrabbit and kangaroo rat at S1. Taken: 9/21/2015.



Photograph 5. Burrowing owl (*Athene cunicularia*) at Station 2 (S2). Taken: 4/4/2016.



Photograph 6. Black-tailed jackrabbit and kangaroo rat at S2. Taken: 4/5/2016.



Photograph 7. Kangaroo rat and pocket mouse (*Chaetodipus* sp.) foraging at S2. Taken: 4/5/2016.



Photograph 8. Heteromyids foraging at S2. Taken: 4/6/2016.



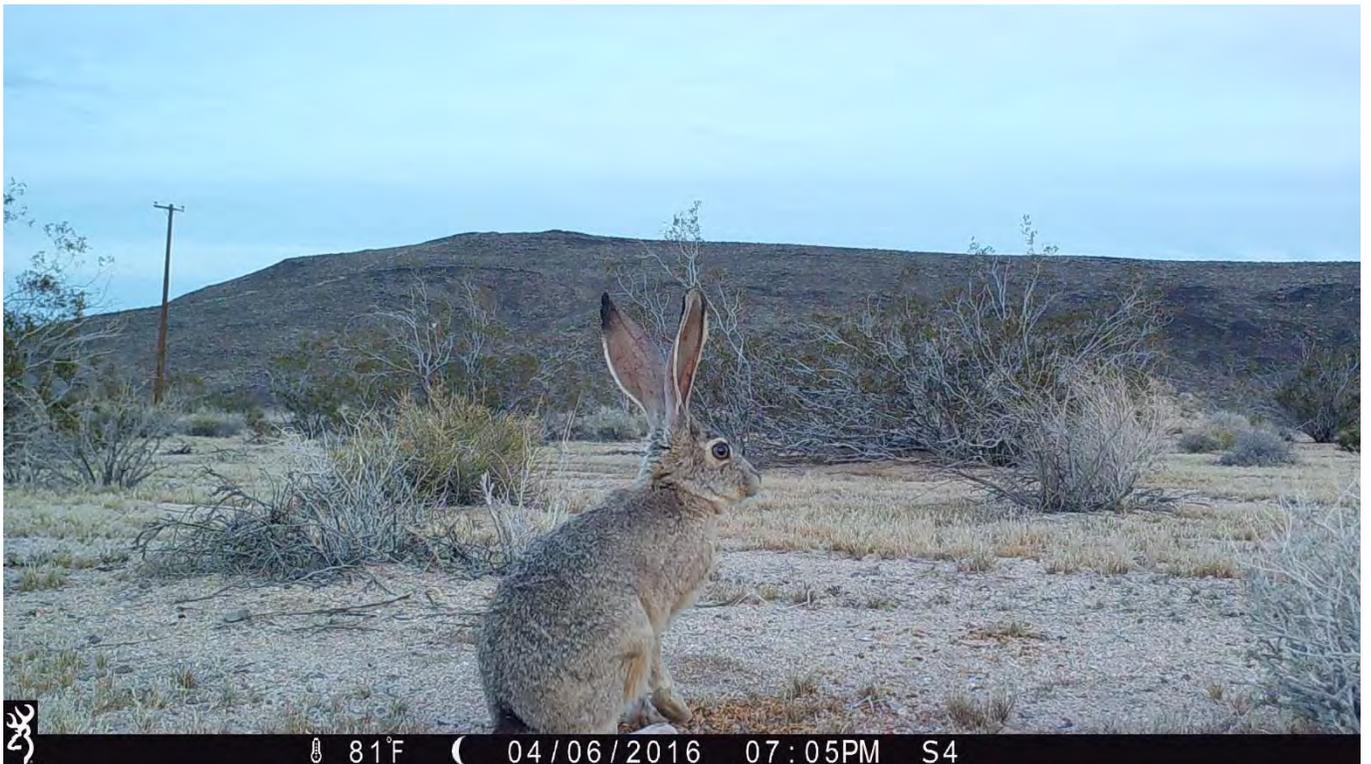
Photograph 9. White-tailed antelope squirrel (*Ammospermophilus leucurus*) foraging at Station 3 (S3). Taken: 4/5/2016.



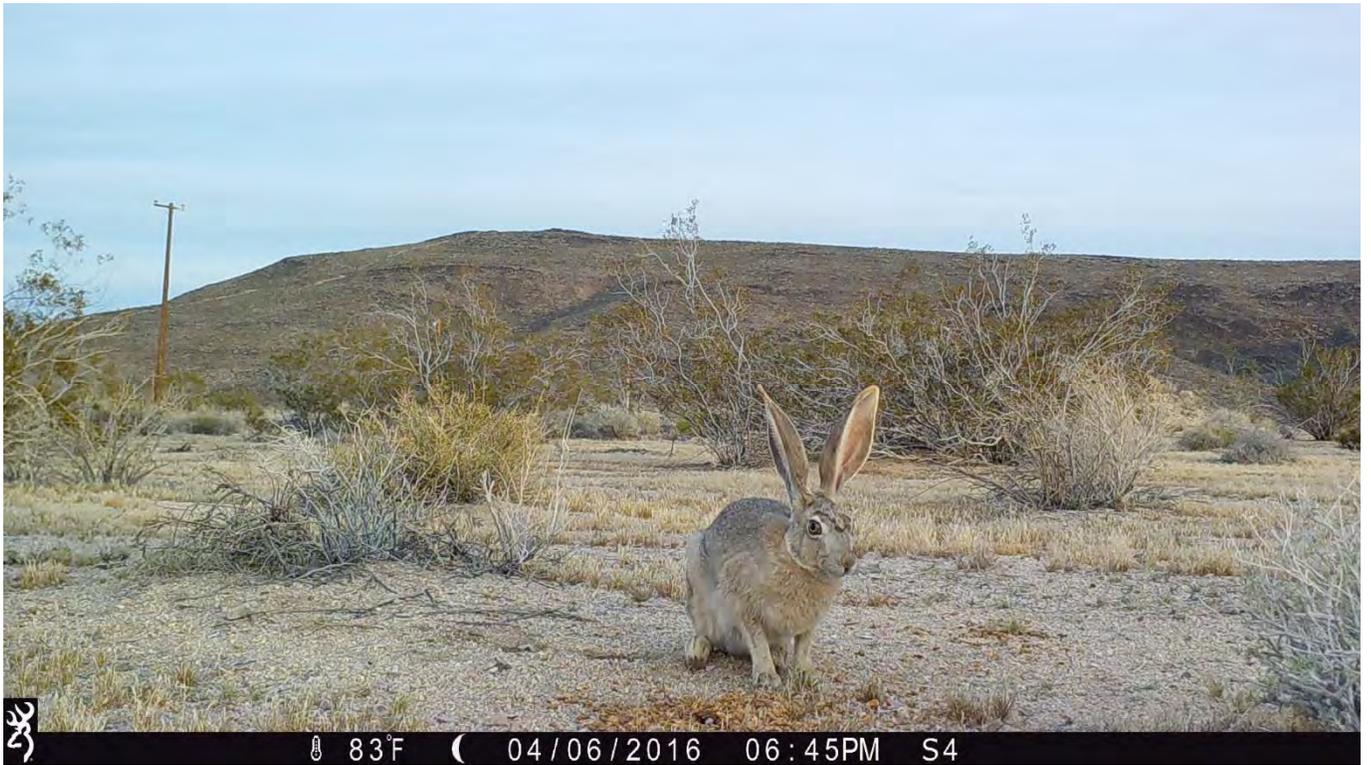
Photograph 10. White-tailed antelope squirrel foraging at S3. Taken: 4/6/2016.



Photograph 11. Black-tailed jackrabbits at S3. Taken: 4/6/2016.



Photograph 12. Black-tailed jackrabbit at S4. Taken: 4/6/2016.



Photograph 13. Black-tailed jackrabbit at S4. Taken: 4/6/2016.



Photograph 14. Domestic cat (*Felis catus*) at S4. Taken: 4/7/2016.



Photograph 15. Coyote (*Canis latrans*) at S5. Taken: 4/4/2016.



Photograph 16. White-tailed antelope squirrel at S5. Taken: 4/5/2016.



Photograph 17. Horned lark (*Eremophila alpestris*) at S5. Taken: 4/5/2016.



Photograph 18. Kangaroo rat at S5. Taken: 4/5/2016.



Photograph 19. White-tailed antelope squirrel at S5. Taken: 4/6/2016.



Photograph 20. Black-tailed jackrabbit at S6. Taken: 4/5/2016.



Photograph 21. Coyote at S6. Taken: 4/5/2016.



Photograph 22. Black-tailed jackrabbits at S6. Taken: 4/5/2016.



63°F ○ 04/07/2016 02:35AM S6

Photograph 23. Domestic cat at S6. Taken: 4/7/2016.



72°F ☾ 04/05/2016 09:32PM S7

Photograph 24. Black-tailed jackrabbit at S7. Taken: 4/5/2016.



Photograph 25. Black-tailed jackrabbit at S7. Taken: 4/6/2016.



Photograph 26. White-tailed antelope squirrel at S8. Taken: 3/22/2016.



63°F (04/04/2016 10:54PM S8

Photograph 27. Black-tailed jackrabbit and kangaroo rat at S8. Taken: 4/4/2016.



92°F (04/05/2016 05:08PM S8

Photograph 28. White-tailed antelope squirrel at S8. Taken: 4/5/2016.



Photograph 29. Black-tailed jackrabbit and kangaroo rat at S8. Taken: 4/5/2016.



Photograph 30. Black-tailed jackrabbits at S9. Taken: 3/23/2016.



45°F ● 03/24/2016 02:59AM CAMERA 1

Photograph 31. Black-tailed jackrabbits at S9. Taken: 3/24/2016.



63°F ☾ 04/06/2016 05:28AM S9

Photograph 32. Kangaroo rat at S9. Taken: 4/6/2016.

Appendix C
Cultural Resources Inventory Report



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion (FY16-1002), Fort Irwin, California

Ms. Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
Department of Parks and Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816-7100

Dear Ms. Polanco:

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California, as discussed in the enclosed report and supporting documents. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

This undertaking consists of the construction of the following components within the 15 acre (six hectares) construction limit/APE. The existing 50 RV sites would be upgraded by constructing 20 ft. x 40 ft. (6.1 m x 12.2 m) concrete parking pads, in addition to a 200 ft² (18.6 m²) area of pavers to the right of the concrete pad, for each site. 59 additional RV parking sites will be constructed that would include concrete parking pads, utility connections, a combination fire ring/grill, and individual picnic tables. There will be allowances for underground utility connection from the additional sites to utility primaries designed to accommodate peak season which include: potable water, 500 linear ft. (152.4 linear m) water distribution system; a 5000 linear ft. (1,524.0 linear m) sanitary sewer line; a 3000 linear ft. (914.4 linear m) electrical line; and a 2,000 linear ft. (609.6 linear m) fiber optic communications line. Width for all trenching activities will not exceed 3 m (9.8 ft.) with a maximum depth of 4 m (13.1 ft.). Maximum depth of excavation for concrete pads is 1 m (3.2 ft.). Improvements to the RV Park expansion area also include enclosed dumpsters, xeriscaping, chain-link fencing, and the construction of a 3,665 ft² (340.5 m²) comfort station. Campground fuel will be provided to occupants with the installation of a 1,000 gallon (3,785.4 liter) capacity propane filling station and a 25 ft. x 40 ft. (7.6 m x 12.2 m) covered concrete pad with six concrete filled pipe bollards. An approximately 200 ft² (18.58 m²) pre-manufactured RV Park registration booth will be installed within the construction limit/APE as well. Cement trucks and earth-moving equipment, such as bulldozers, backhoes, and dump trucks, would be used for construction. All ground-disturbing activities would be confined within the construction limits/APE. Access to the construction site will be via existing dirt and paved roads.

A cultural resources records search was conducted by CH2MHILL on December 14, 2015, using the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC). In addition, a records search was conducted at the Fort

Irwin Directorate of Public Works (DPW) Cultural Resources Library on March 29, 2016. These records searches included a review of all recorded prehistoric and historic archaeological sites, historic architectural resources, as well as cultural resources survey and excavation reports within the APE and a one mile records search buffer around the APE. Staff also consulted databases at the websites for the California Office of Historic Preservation, California Historical Resources, California Historical Landmarks, California Points of Historical Interest, California Register of Historical Resources, and the National Register of Historic Places.

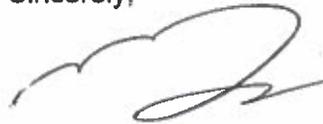
The records search revealed the APE and the records search buffer had been previously surveyed for cultural resources through 18 separate projects (see enclosed report). 19 prehistoric archaeological sites and six isolated finds were recorded within the records search area during the previous surveys. None of these resources are within the APE for the current undertaking, and they will not be affected by construction activities.

On December 15, 2015, CH2MHILL conducted an intensive pedestrian survey of the entire APE. Fieldwork was conducted by a two-person team that walked a series of linear transects spaced 10-15 m apart. Ground surface visibility was generally excellent at 80 to 100 percent in the RV park expansion area but decreased to less than 20 percent along the sewer pipeline corridor as this part of the APE was largely paved. Overall, the project site has a low archaeological sensitivity, and subsurface deposits are not expected because of the geomorphology of the APE consisting of a deflationary environment, not a depositional one. Additionally, active alluvial channeling, vehicle and recreational use, utilities, and maintenance of roads have disturbed large portions of the APE. One prehistoric isolate, consisting of a chalcedony flake, was discovered during this survey.

CH2MHILL archaeologists recommend the prehistoric isolate found within the APE not eligible for the National Register of Historic Places (NRHP). I accept this recommendation, and I request your concurrence with this finding. Based on the results of the cultural resources identification and evaluation efforts, I have determined that no properties listed in the NRHP, nor considered eligible for inclusion in the NRHP, exist within the APE of this undertaking. Therefore, a finding of "No Historic Properties Affected" is appropriate for this undertaking in accordance with 36 CFR 800.4(d)(1), and I request your concurrence with this finding.

If you have any questions, please contact Mr. Clarence Everly (Fort Irwin Natural and Cultural Resources Program Manager) at (760) 380-3740 or at clarence.a.everly.civ@mail.mil. Written correspondence regarding this undertaking should be addressed to: Mr. Muhammad Bari, Directorate of Public Works, Environmental Division, ATTN: IMNT_PWE, PO Box 105085, Fort Irwin, CA 92310-5085

Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure



Department
of the Army

**Final
CULTURAL RESOURCES INVENTORY
REPORT FOR THE RV PARK EXPANSION
PLAN
Fort Irwin, California**



Installation
Management
Command

July 2016

Executive Summary

CH2M HILL, Inc. (CH2M) conducted a cultural resources assessment to address potential effects to historic properties from constructing the Recreational Vehicle (RV) Park Expansion Project located at Fort Irwin in San Bernardino County, California (see Figure 1-1). The purpose of this project is to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power. No vehicles, equipment, or materials would be allowed outside of the construction limits or staging areas of this project.

An assessment of potential effects to historic properties as a result of this undertaking is required in compliance with Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA), in consultation with the State Historic Preservation Officer (SHPO), and as required by 36 *Code of Federal Regulations* (CFR) 800, Department of Defense Instruction 4715.16, and Army Regulation 200-1. The APE for this project is defined as a total area of approximately 15 acres (six hectares).

Significant cultural resources are those either listed in the National Register of Historic Places (NRHP) or considered eligible for listing in the NRHP and are defined as Historic Properties (36 CFR 800.16[1]). As a requirement of the NHPA, the U.S. Army (Army) must take into account the effects of an undertaking on historic properties before beginning the construction of any project.

This report was prepared to document the results of the cultural resources study conducted in support of the RV Park Expansion Project. Fieldwork was conducted on December 15, 2015. One isolated find, a chalcedony flake, was discovered as a result of this survey. The isolated find does not constitute a historic property and no further cultural resources were observed.

As a result, no properties listed in the NRHP, or considered eligible for listing in the NRHP, exist within the APE for this proposed undertaking. Therefore, a finding of “No Historic Properties Affected” is appropriate for this undertaking in accordance with 36 CFR 800.4(d)(1).

Contents

Section	Page
Executive Summary.....	iii
Acronyms and Abbreviations.....	vii
1 Introduction	1-1
Setting.....	2-1
2.1 Environmental Setting.....	2-1
2.1.1 Geology	2-1
2.1.2 Biology	2-1
2.1.3 Current Land Use	2-2
2.2 Cultural Context	2-2
2.2.1 Mojave Desert Cultural Chronologies.....	2-3
2.2.2 Ethnohistory.....	2-6
2.3 History.....	2-8
2.3.1 Spanish/Mission Period (1769 to 1834).....	2-9
2.3.2 Rancho Period (1821 to 1848)	2-9
2.3.3 American Period (1848 to Present)	2-10
2.3.4 Fort Irwin Project Vicinity	2-10
2 Study Methods and Results	3-1
3.1 Area of Potential Effects	3-1
3.2 Literature Search.....	3-2
3.3 Literature Search Results	3-2
3.4 Native American Consultation	3-5
3.5 Field Inventory Methodology	3-5
3.6 Field Inventory Results.....	3-5
3.7 Management Considerations	3-6
3 References.....	4-1

Appendices

- A Project Photographs
- B CONFIDENTIAL DPR Forms
- C Native American Consultation Letters

Tables

- 2-1 Cultural Chronologies Proposed for the Mojave Desert
- 3-1 Cultural Resources Reports within One Mile (1.6 Kilometers) of the Project Area
- 3-2 Cultural Sites within One Mile (1.6 Kilometers) of the Project Area

Figures

- 1-1 Vicinity Map
- 1-2 Area of Potential Effects

Acronyms and Abbreviations

amsl	above mean sea level
APE	area of potential effects
BP	before present
cal	calibrated years
CFR	<i>Code of Federal Regulations</i>
CH2M	CH2M HILL, Inc.
CHRIS	California Historical Resources Information System
CRHR	California Register of Historic Resources
DPW	Directorate of Public Works
I-15	Interstate 15
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
M.A.	Master of Arts
n.d.	no date
NADB	National Archaeological Database
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
RPA	Register of Professional Archaeologists
RV	Recreational Vehicle
SCCIC	South Central Coastal Information Center
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

SECTION 1

Introduction

CH2M HILL, Inc. (CH2M) conducted a cultural resources assessment to address potential effects to historic properties from the construction of the Recreational Vehicle (RV) Park Expansion Project located at Fort Irwin in San Bernardino County, California. The project will encompass an area of 15 acres (six hectares) and is shown on Figure 1-1. The purpose of this project is to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power. No vehicles, equipment, or materials would be allowed outside of the construction limits or staging areas of this project.

The project is located within Township 13 North, Range 2 East, Section 31 and 36 of the San Bernardino Base Meridian on the Langford Well, California, U.S. Geological Survey (USGS) 7.5-minute topographical quadrangle map. Additional details regarding the area of potential effects (APE) are provided in Section 3.1.

The purpose of the survey was to determine the presence of historic properties within the APE, pursuant to Section 106 of the National Historic Preservation Act (NHPA) (36 *Code of Federal Regulations* [CFR] 800), Department of Defense Instruction 4715.16, and Army Regulation 200-1. Fieldwork was conducted on December 15, 2015.

This study was conducted by Gloriella Cardenas, M.A., RPA, of CH2M, who meets the qualifications for Archaeological Principal Investigator in the Secretary of the Interior's Professional Qualification Standards. Natalie Lawson, M.A., RPA, of CH2M assisted in the pedestrian survey.



Legend

 Fort Irwin Boundary

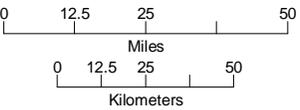
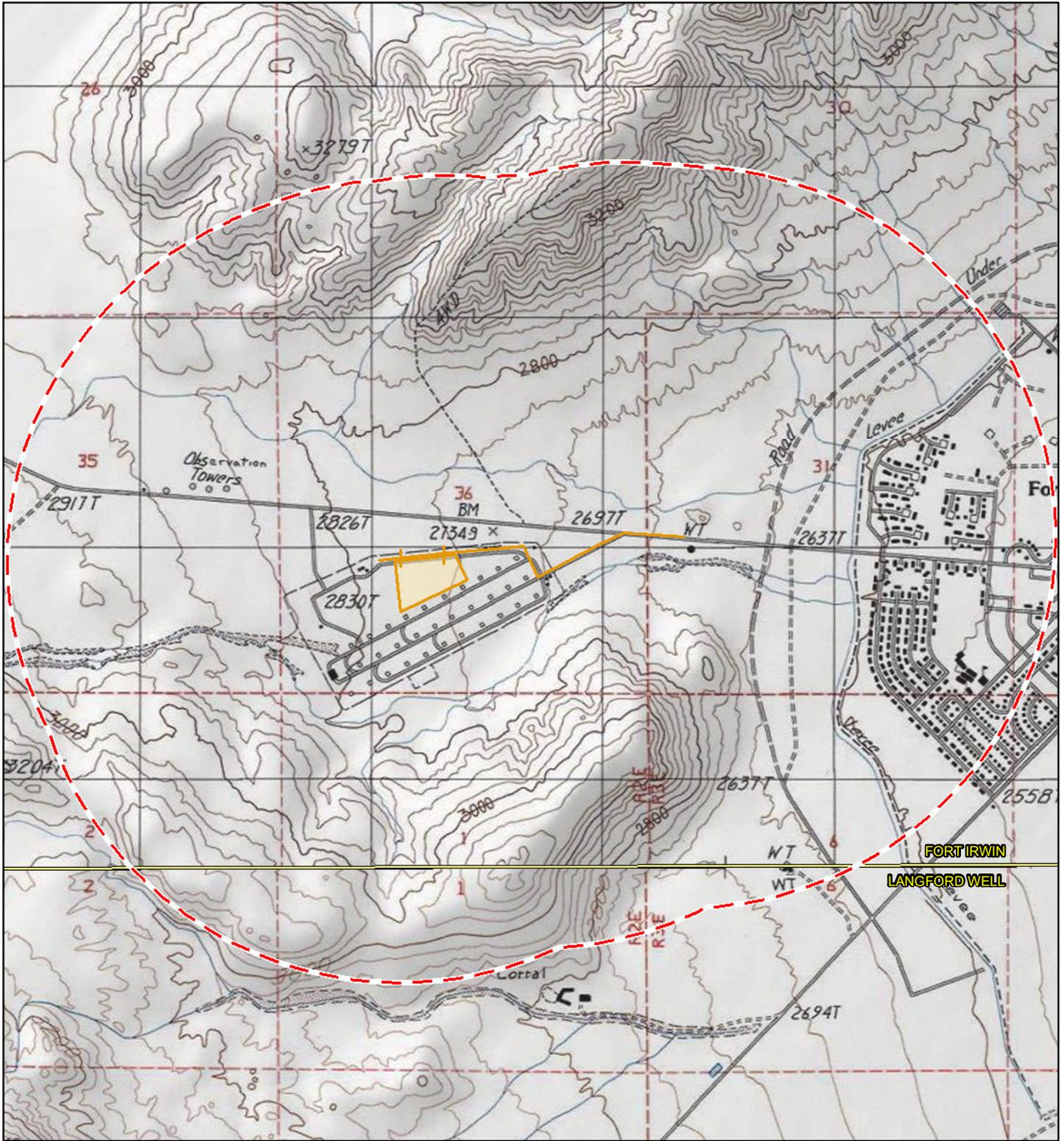


FIGURE 1-1
Vicinity Map
RV Park Expansion
Fort Irwin, CA



LEGEND

- ▭ Area of Potential Effects/Survey
- - - Records Search Area
- USGS Quad Boundary

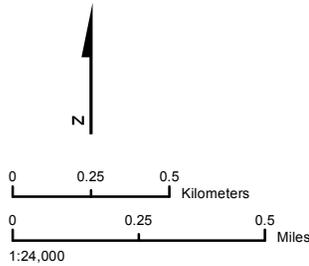


FIGURE 1-2

**Area of Potential Effects
RV Park Expansion
Fort Irwin, California**

PLSS: Township 15N, Range 2E;
 Township 14N, Range 3E;
 Township 13N, Range 2E;
 Township 13N, Range 3E
 USGS 7.5 Minute Quads:
 Fort Irwin & Langford Well

Source Information: National Geographic Society, i-cubed

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Setting

2.1 Environmental Setting

The project is located at Fort Irwin, California, which is approximately 15 miles (24 kilometers) north of Interstate 15 (I-15) and north of the Mojave River. The city of Barstow is approximately 30 miles (48 kilometers) southwest of Fort Irwin. Elevation within the project area is 2,378 feet (725 meters) above mean sea level (amsl).

2.1.1 Geology

Fort Irwin is in the north-central area of the Mojave Desert. The Mojave Desert is bound and defined by the San Andreas Fault in the west and the Garlock Fault in the north; this has given rise to the term “the Mojave Block” to describe this area between the faults (Fort Irwin 2011b).

The Fort Irwin area land formations are composed of mountains, broad alluvial fans, and flat valleys. The geology of Fort Irwin ranges in age from Precambrian to Holocene, which translates to 600 million years ago to present. Soils consist of metasedimentary and metavolcanic sediments; unconsolidated alluvium of clay, silt, sand, and gravel; aeolian sands; and playa sediments (Fort Irwin 2011b).

The project site is located within an alluvial basin; sediments in the project area are composed of highly permeable unconsolidated alluvium and aeolian sand. The topography is generally flat with alluvial drainages creating the only topographical elevation differences. The immediate area is subject to alluvial impacts in the form of channeling and erosion, typical of basin environments in the Mojave Desert and within Fort Irwin.

Ten identified springs occur within Fort Irwin (Fort Irwin 2011b). The water availability of the springs is dependent on rainfall amounts and duration. Precipitation at Fort Irwin occurs primarily in the winter months and it averages less than 4 inches (10.16 centimeters) annually (Fort Irwin 2004).

2.1.2 Biology

The flora and fauna of Fort Irwin is described in the installation Integrated Natural Resources Management Plan (INRMP; USACE 2006). One specific vegetation community (Mojave creosote bush scrub) was identified within the APE. Species typically associated with Mojave Desert wash scrub are also present in some of the dry washes near the APE with typical species dominating within the proposed project area. Generally, dry washes have upland species associated with Mojave creosote bush scrub present (USACE 2006).

Mojave creosote bush scrub, an association dominated by the large shrub creosote bush (*Larrea tridentata*), is the most widespread community at Fort Irwin, occurring throughout the range below 3,610 feet (1,100.33 meters) on alluvial slopes, valley floors, and mountain slopes. A subassociation of this vegetation type is described as the creosote-bursage association based on the codominance between creosote bush and bursage (*Ambrosia dumosa*). Many subdominant shrubs typically occur in creosote bush scrub, including range rhatany (*Krameria erecta*), silver cholla (*Opuntia echinocarpa*), Anderson’s boxthorn (*Lycium andersonii*), desert straw (*Stephanomeria pauciflora*), wishbone bush (*Mirabilis bigelovii*), and cheesebush (*Hymenoclea salsola*). At higher elevations, subdominants include California buckwheat (*Eriogonum fasciculatum*), hopsage (*Grayia spinosa*), winter fat (*Krascheninnikovia lanata*), and bladdersage (*Salazaria mexicana*) (USACE 2006).

Mojave Desert wash scrub is a low, shrubby, diverse community occurring in open washes, arroyos, and canyons throughout the desert. Representative shrubs include spiny senna (*Senna armata*), honey mesquite (*Prosopis glandulosa*), rayless encelia (*Encelia frutescens*), cheesebush, desert almond (*Prunus fasciculata*),

indigo bush (*Psoralea arborescens*), and sandpaper plant (*Petalonyx thurberi*). In some areas, this community may have scattered small tree species (USACE 2006).

Wildlife present at Fort Irwin consists of a variety of species adapted to desert scrub habitats that provide little cover and xeric conditions. Small mammals found at Fort Irwin include blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and whitetailed antelope squirrel (*Ammospermophilus leucurus*). Small rodent species include kangaroo rats (*Dipodomys* spp.), pocket mice (*Chaetodipus formosus*; *Perognathus* spp.), and field mice (*Peromyscus* sp.). Desert woodrat (*Neotoma lepida*) and Botta's pocket gopher (*Thomomys bottae*) are also common. Larger mammals include badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), grey fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and mountain lion (*Felis concolor*). Kit fox and coyote are common throughout the area, whereas the others listed above are localized and rare. Common bird species include the blackthroated sparrow (*Amphispiza bilineata*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), and greater roadrunner (*Geococcyx californianus*). Additional species occur as migrants that may winter on the project site.

The Mojave creosote bush scrub supports a diverse assemblage of reptiles, including common lizards such as zebra-tailed lizards (*Callisaurus draconoides*), side-blotched lizards (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), and western whiptails (*Cnemidophorus tigris*). Less common lizards might include the desert horned lizard (*Phrynosoma platyrhinos*), long-nosed leopard lizard (*Gambelia wislizenii*), and desert iguana (*Dipsosaurus dorsalis*). Desert tortoise (*Gopherus agassizii*) occurs in varying densities throughout Fort Irwin and the surrounding area.

2.1.3 Current Land Use

Fort Irwin encompasses approximately 761,405 acres (1,190 square miles or 308,130 hectares). Over 80 percent of Fort Irwin's land area is used for military training. A cantonment area occupies approximately 1,920 acres (three square miles or 777 hectares) and provides temporary and permanent living quarters for soldiers and their families along with the support facilities of Fort Irwin. The cantonment area consists of residential neighborhoods, support facilities, retail centers, restaurants, and healthcare facilities.

Fort Irwin's population includes approximately 5,000 assigned soldiers and 6,934 family members. In addition, approximately 6,300 soldiers visit Fort Irwin during training rotations, which occur 10 times a year (Fort Irwin 2011b).

2.2 Cultural Context

Linguistic and genetic studies suggest that human colonization of North America may have occurred 20,000 to 40,000 years ago. Abundant archaeological evidence exists that humans were present in North America for at least the past 11,500 years. In addition, fragmentary, but growing records exist that humans were present before that date. Evidence of this earlier occupation is not yet conclusive but is beginning to be accepted by archaeologists.

In the western United States, documented early sites include the Paisley Caves in Oregon with a date of 12,450 years before present (BP) (Jenkins et al. 2012) and Arlington Spring on Santa Rosa Island with dates as early as 13,000 years BP [National Park Service (NPS) n.d]. In the eastern United States, the Meadowcroft Rockshelter in Pennsylvania, Saltville and Cactus Hill in Virginia, and the Topper site in South Carolina are sites that have produced apparently reliable dates documenting human occupation at greater than 12,500 years BP (Goodyear 2005, 2009, and n.d.). Investigations at the Buttermilk Creek Site in central Texas have produced dates of human occupation as early as 15,500 years BP (Waters et al. 2011).

More sites in North and South America are beginning to be accepted as dating to earlier times and, although the Sutton et al. (2007) chronology (Table 2-1) acknowledges this fact by the inclusion of the hypothetical Pre-Clovis Complex, no sites from this period are currently documented in the Mojave Desert. Evidence for Paleoindian occupation in California exists, particularly along the coast of southern California (Erlandson et al. 2011); elsewhere in southern California, Paleoindian remains are inconclusive (Byrd and Raab 2007). A small faction of the archaeological community has proposed Pre-Clovis sites within the Mojave Desert, but much of these data remain currently unpublished and unsubstantiated (Sutton et al. 2007).

2.2.1 Mojave Desert Cultural Chronologies

Generally, cultural developments in southern California have occurred gradually and have shown long-term stability, making the synthesis of chronologies and applying them to specific locales problematic. Of the many chronological sequences proposed for southern California, two primary regional syntheses have been commonly used for the southern California deserts: William Wallace (1955, 1962, and 1978) and Claude Warren (1968 and 1984). Wallace first presented a chronology of southern California in 1955; by 1962, Wallace modified this chronology specifically for the high desert; by 1978, the chronological syntheses for southern California were finalized by Wallace. Wallace uses major cultural developments to define four cultural horizons, each with characteristic local variations: Early Period (Early Man Horizon), Milling Stone, Intermediate, and Late Period. Warren first presented a chronological synthesis of southern California deserts in 1968; in 1984, Warren published a chronological synthesis for coastal southern California. Warren defines five periods in southern California prehistory: Lake Mojave, Pinto, Gypsum, Saratoga Springs, and Protohistoric. Until recent times, and in some cases, to date, chronologies based on Warren and Wallace syntheses have been in use. In 2007, however, a synthesis of cultural prehistory in the Mojave was presented by Sutton et al. (2007), which includes results from 20 years of extensive fieldwork conducted in the Mojave Desert by various individuals and groups. Sutton et al. (2007) divides Mojave Desert prehistory into four periods: Pleistocene, Early Holocene, Middle Holocene, and Late Holocene; each period is further subdivided into complexes that are based on the work from Warren and Wallace in conjunction with the region-specific results of over 20 years of Mojave Desert archaeological analysis (Sutton et al. 2007). See Table 2-1 for a brief comparison of these three chronologies. Neither the Warren nor Wallace chronologies begin prior to Terminal Pleistocene, circa 12,000 years BP. No sites from the Pre-Clovis Complex are currently documented in the Mojave Desert.

TABLE 2-1

Cultural Chronologies Proposed for the Mojave Desert

Cultural Resources Inventory Report for the RV Park Expansion Plan, Fort Irwin, California

Approximate Date	Sutton et al. (2007)		Warren (1984)	Wallace (1962)	Associated Artifacts
	Temporal Period	Cultural Complex	Cultural Period	Cultural Horizons	
Up to 10000 BC	Pleistocene	Pre-Clovis (Hypothetical)			Unknown
10000–8000 BC		Paleo-Indian	Clovis	Early Man	Fluted points
8000–6000 BC	Early Holocene	Lake Mojave	Lake Mojave	Millingstone	Stemmed points
7000–3000 BC	Middle Holocene	Pinto	Pinto		Pinto points
		Deadman Lake (currently 29 Palms only)			Contracting stem and leaf shaped points
2000 BC to AD 200	Late Holocene	Gypsum	Gypsum	Intermediate	Gypsum and Elko Series points
AD 200–1100		Rose Spring	Saratoga Springs		Rose Spring and Eastgate Series points
AD 1100–Contact		Late Prehistoric	Protohistoric	Late Prehistoric	Desert Series points, ceramics

2.2.1.1 Paleoindian Period (10000 to 8000 BC)

The Paleoindian Period covers the interval from the first accepted presence of humans in southern California in the late Pleistocene until approximately 8,000 cal BC. Artifacts and cultural activities from this period represent a predominantly big game hunting culture; diagnostic artifacts include extremely large, often fluted bifaces associated with use of the spear and the atlatl. Populations appeared to have been relatively small and highly mobile, living in temporary camps near readily available water. Evidence for Clovis occupation in the Mojave Desert is currently limited to scattered isolated points and a single site at Lake China that is presumed to be an occupation site (Sutton et al. 2007: 234). Additionally, a single Clovis-like point fragment was found in the Tehachapi Mountains and other points resembling Clovis have been found in the Tiefert Basin at Fort Irwin, Searles Lake, and other locations within the region (Moratto 2004: 87).

2.2.1.2 Lake Mojave Complex (8000 to 6000 BC)

In the deserts of southern California, the earliest substantive remains of human occupation are found along the shoreline of ancient Lake Mojave in San Bernardino County, for which this period is termed, and in ancient Lake Cahuilla of Riverside and Imperial counties. The Lake Mojave Period is associated with now-dry pluvial (also called paleo) lakes found throughout the Mojave Desert. Artifacts observed at Lake Mojave Period sites include stylized dart points of the Lake Mojave and Silver Lake series, well-made bifacial knives and other cutting tools, large domed scrapers or scraping planes, crescents, occasional cobble core tools, and ground stone implements (Moratto 2004: 96; Wallace 1962; Sutton et al. 2007: 237). Flaked stone artifacts, which make up the largest part of the toolkit, are often formal tools made of non-local materials, while ground stone tools, present in far smaller numbers, generally show ephemeral wear, thus suggesting long-term curation of more easily ported items and less reliance on floral resources. Site types include extensive habitation sites, small camps, and workshops (Sutton et al. 2007). In addition to sites known in the Lake Mojave and Lake Cahuilla area, there are sites with artifact assemblages from this period at Fort Irwin, Twenty-nine Palms, and China Lake. Archaeofaunal remains recovered from Lake Mojave sites at Fort Irwin indicate a higher reliance on smaller game, such as rabbits, rodents, and some reptiles, and less hunting of large game (Sutton et al. 2007). Rogers (1939) describes several sites of the same time period situated along desiccated lakes, or playas, from the Colorado Desert through inland San Diego County. The final lacustrine phase for the pluvial lakes, such as Lake Mojave and Lake Manix within this region of the Mojave Desert, occurred during this period.

2.2.1.3 Pinto Complex (7000 to 3000 BC)

The Pinto Complex is the most widely distributed of the early complexes in the Mojave Desert and occurs in a wide variety of topographic and environmental zones, including near remnant pluvial lake basins, near fossil stream channels, near springs or seeps, and in upland areas. Large Pinto Complex sites with deep middens and a wide range of artifact types appear to correlate with stable water sources. In some parts of the Mojave Desert, a temporal overlap is noted between the Lake Mojave Complex and the Pinto Complex.

Radiocarbon dates from the Fort Irwin and Twenty-nine Palms areas, and also the Garlock Fault site in Kern County, range from 8340 BC to 6300 BC, indicating the development of the Pinto Complex in the early Holocene and corresponding to the end of the Lake Mojave Complex. There appears to be good continuity of flaked stone technologies from one complex to the next, including the material selection of locally available stone as well as use of bifacial and unifacial tool forms. The main distinction between the two periods appears to be the number of ground stone tools found at Pinto sites in comparison to the relative paucity of ground stone tools found at Lake Mojave sites. High levels of ground stone found at Pinto sites indicate that the emergence of intensive plant resource exploitation began by approximately 7000 cal BC, before the Altithermal dry climatic episode (Sutton et al. 2007: 238-239).

Pinto sites are found in a wide range of environments, and the flourishing of new economies including greater plant resource exploitation is seen both in the desert and along the Pacific coast during the Pinto Complex. *Olivella* shell beads have been found with Pinto sites, indicating the beginnings of trade with the

coast. Diagnostic artifacts recovered from Pinto Period archaeological sites include heavy keeled scrapers, flat millstones, manos, and Pinto series projectile points, which are large, coarsely made points, indicating the continued use of darts and atlatls (Warren 1984). By the end of the middle Holocene, conditions in the Mojave Desert became much warmer and much drier. Currently, few sites are known to date to the period between 3000 and 2000 cal BC, and it appears that parts of the Mojave may have been abandoned (Sutton et al. 2007).

2.2.1.4 Gypsum Complex (2000 BC to AD 200)

The start of the Gypsum Complex coincides with the beginning of the Little Pluvial wetter climatic episode at approximately 2000 BC and continues into the drier period following the Little Pluvial. At Fort Irwin, eight sites date from this period. Despite the paucity of sites dating to this period in the Mojave Desert, the first reliable evidence for contact between the desert and the coast dates to the Gypsum Period, and Southwestern influence in the California deserts is also observed (Warren 1984; Sutton et al. 2007).

Olivella shell beads and *Haliotis* rings from the coast and split twig figures from the Southwest are found at Gypsum sites. Gypsum Complex toolkits include the diagnostic Elko and Elko-eared points, leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, the occasional large scraper plane, and hammerstones. Elko series points are associated by Moratto (2004) with the spread of Uto-Aztec speakers throughout the Mojave during this period. A shift in food procurement strategies also marks this period in that grinding implements, including manos and millstones, became common and mortars and pestles were introduced (Warren 1984).

People living in the deserts had adapted to the more arid conditions of the southern California deserts by the end of the Gypsum Complex. New procurement strategies and regular trade contact with peoples living on the coast provided stability to desert dwellers and, despite the return to a warmer, drier climate at the end of the Little Pluvial, populations did not decrease in the deserts at the end of the Gypsum Complex as they had at the end of the Pinto Complex (Sutton et al. 2007).

2.2.1.5 Rose Spring Complex (AD 200 to AD 1100)

During this period, a strong coastal influence extends into the western Mojave Desert (Warren 1984) and the eastern Mojave experiences an influx from Colorado River groups. The bow and arrow moved into the Mojave Desert at this time. Evidence for a significant population increase and rather dramatic changes in artifact assemblages characterize the Rose Spring Complex in the eastern Mojave (Sutton et al. 2007). Generally, the Rose Spring Complex appears to be in strong continuity with the Gypsum Complex. Similar artifacts, such as millstones, manos, mortars, pestles, and incised stones were still used. Desert populations continued a successful hunting and gathering adaptation to the desert environment through increasingly complex subsistence strategies, including the development of the bow and arrow. The sites from this period contain a variety of trade items, including southern California shell beads, steatite items, and other coastal artifacts. Eastgate and Rose Spring projectile points are the diagnostic artifacts (Sutton et al. 2007).

Rose Spring sites are found near springs, washes, and occasionally lakeshores. Architectural evidence of pit houses, wickiups, and other types of structures indicate an increase in sedentism during this period; however, the Medieval Climatic Anomaly began during the Rose Springs Complex. The resulting desiccation of existing lakes and other water sources in the Mojave Desert appears to have significantly changed settlement patterns, resulting in a shift in dependence upon permanent water sources to more ephemeral ones. The Rose Springs Complex ended by approximately AD 1100.

2.2.1.6 Late Prehistoric Complexes (AD 1100 to Historic Times)

During this period, there was a strong reliance on plant food gathering and hunting of small game, and a decreased reliance on large game (Warren 1984). Separate complexes emerged that appear to represent historically known Native American linguistic/cultural ethnic groups. Anasazi turquoise mining, Haketayan influence from the Colorado River, and the spread of the Numic Paiute and Shoshone cultures east from the

western Mojave Desert occurred during this period (Sutton et al. 2007: 242). Seasonal movement was common and resulted in a diverse array of site types. For the populations in the Project region within the Mojave, large village sites remain marked by a paucity of pottery. Characteristic artifacts include Desert series and Cottonwood projectile points, buffware and brownware ceramics, shell and steatite beads, and milling tools. Trade continues to develop and expand with groups on the coast (Sutton et al. 2007: 242). Late during the Late Prehistoric Complex, there appears to be an abandonment of village sites in the desert region (Moratto 2004: 391; Thomas 2011: 17-18).

2.2.2 Ethnohistory

Fort Irwin is prehistorically and historically within the territory of Native Americans. The project area is located within the traditional territories of the Vanyume, the Southern Paiute, and the Chemehuevi. Prehistoric and historic trails are found throughout this portion of the Mojave Desert, including areas within Fort Irwin.

2.2.2.1 Southern Paiute and Chemehuevi

The Southern Paiute peoples and the Chemehuevi, a closely related people, belong to the Southern Numic branch of the Uto-Aztecan language family. There is historical documentation of both the Chemehuevi and the Southern Paiute having hunted deer and bighorn sheep. Sixteen identifiable groups of the Southern Paiute, sometimes called “bands,” formerly occupied a broad strip of territory from southern Utah and southern Nevada, and along the west side of the Colorado River into southern California. The first historical observations of the Southern Paiute were made by fathers Escalante and Dominguez in 1776. The fathers observed Paiute homesteads and farms along the Colorado, as well as small maize fields watered with river water that flowed through irrigation ditches. Subsequent expeditions through the traditional territories resulted in similar observations regarding Paiute agriculture, adding that melon and squash were also cultivated (Stoffle and Zedeno 2001).

The Southern Paiute are very similar culturally and linguistically to the adjacent Western and Southern Ute, except that the Ute took on some superficial Plains Indians traits during the Protohistoric period. The Chemehuevi were strongly influenced culturally by the Mojave, who lived to the east across the Colorado River (Kelly and Fowler 1986: 368). The nineteenth-century territories of the Southern Paiute and Chemehuevi groups reflect the adaptation of each to their unique physical and political environments subsequent to the apparent entry of Numic speakers into the region in approximately AD 1200. Overall, the Chemehuevi territory was one of the largest areas in California with a uniform dialect (Kroeber 1925). The Chemehuevi recognized local divisions among themselves. Within the eastern Mojave, the Chemehuevi were known as the Hokwaits. The sociopolitical organization of the Southern Paiute groups, including the Chemehuevi, did not include organs of central political control. The boundary for each group appears to have been relatively fluid and permeable. Groups were essentially clusters of individual households that variously coalesced and dispersed during the year to facilitate different economic pursuits. Favored residence locations adjacent to springs or agricultural plots were held as private property and subject to inheritance. Large household clusters often had a headman, whose authority was more advisory than authoritative (Kelly and Fowler 1986: 380).

The Chemehuevi appeared to be in the process of moving or expanding their territory in the early Historic period, and apparently without the influence or pressure from white incursions (Kroeber 1925: 594), which is not surprising considering the great expanse and inhospitality of the territory attributed to them.

Chemehuevi beliefs were closer to those of groups found east of Chemehuevi territory, rather than those of the geographically closer southern or central California groups. Many Chemehuevi songs are similar, if not the same, as Mojave songs, including their Shaman and Doctoring songs (Kroeber 1925).

Although many of the 16 Southern Paiute groups alternately visited, hunted, and gathered on each other’s territories throughout the year, almost all of the 1,920 individual Chemehuevi would gather for the annual Mourning Ceremony. All groups were not, however, on friendly terms as there were intergroup feuds

involving alleged kidnappings of women and children for slavery. Additionally, the Chemehuevi had external relationships with the Mojave, Navajo, and Utes that were sometimes friendly and sometimes hostile. The Southern Paiutes often accused the Ute and Navajo of kidnapping raids. Relations with the Western Shoshone to the north and northwest were generally friendly and often involved intermarriage. The Paiutes also had generally amicable relations with other Mojave Desert groups including the Serrano and Vanyume, Kawaiisu, Cahuilla, and Diegueño. Although the Chemehuevi borrowed heavily from Mojave culture (Kelly and Fowler 1986: 369-370), Kroeber (1925: 596) asserted that the Chemehuevi generally tried to avoid the frequent warfare that involved many of their more powerful and populous regional neighbors to the east.

Both the Chemehuevi and the Southern Paiute practiced some limited agriculture, as well as a hunting and gathering subsistence. Hunted animals included rabbits, quail, small rodents, and chuckwalla, a large lizard of rocky habitats. The piñon nut, which is harvested in October from the woodland that occurs in the larger mountains at altitudes of 6,000 to 8,000 feet (1,828.80 to 2,438.40 meters) amsl, comprised a large portion of consumed starch. Cones were beaten from the trees in early fall and sun dried. Large quantities were collected and cached in dry places, and the nuts were roasted before eating. Seeds were collected from a number of sources. Sand grass provided seeds that were gathered with a basket and a large paddle. The berries from the lycium bush also were collected. Seeds were collected from cacti, such as the Devil's pincushion, and the paddles, buds, and immature fruit of one type of prickly pear were collected and dried. These were cooked in hot stones, grass, and earth and then salted for consumption. Historical miners reported that when food was scarce among the Panamint, a village group of the Southern Paiute, almost any green plant was eaten after boiling.

Mesquite beans were dried and pounded into flour to make small cakes or loaves. Among the Panamint, Joshua trees were consumed in a manner similar to agave or mescal. The buds were removed in early spring and roasted. Similarly, the Southern Paiute consumed mescal, after steaming in grass-covered and rock-lined pits. They were thought to cultivate corn, squash and gourds, pumpkins, sunflowers, and winter wheat wherever feasible, particularly on floodplains. The adoption of farming did not appear to have significantly altered the seasonally mobile way of life; the elderly generally stayed to tend crops while most of the population undertook its seasonal hunting and gathering forays (Kelly and Fowler 1986: 371).

The Chemehuevi and Southern Paiutes made both twined and coiled basketry items, including vessels, hats, and cradles (Kelly and Fowler 1986: 375). Kroeber (1925: 597) attributes some artistic designs as having been painted rather than woven on basketry items. The Chemehuevi and Southern Paiute groups made pottery that seems to have mimicked Mojave styles. Chemehuevi pottery technology was more developed than among other Southern Paiute groups and was used to create cooking and storage vessels, water jars, scoops or spoons, and large pots for ferrying children across the river. They also constructed log rafts and reed balsas for river transport (Kelly and Fowler 1986: 377). Houses were simple frames with reeds, constructed to function only as shelters. Sweathouses were not constructed at Chemehuevi villages (Kroeber 1925).

Contact with the Spanish occurred relatively late, but by the early nineteenth century, Southern Paiutes were enslaved in Santa Fe, New Mexico. The Utes may have served as agents to the Spanish for capturing slaves. Slave raiding and communicable diseases introduced by Europeans depleted the Paiute population and left some ecologically favorable localities depopulated. The Mormons, who entered the region in the 1840s, halted slave trading by the mid-1850s. However, the Mormons displaced the Southern Paiutes from some of their most productive gathering and horticultural areas. The Paiutes, particularly those with horses, sporadically retaliated for these incursions by raiding white settlers and travelers during the 1850s to the 1870s (Kelly and Fowler 1986: 386-390).

Eventually, survivors of white contact were confined to reservations on largely marginal lands in the late nineteenth and early twentieth centuries. Termination of the reservations by the federal government in the 1950s left most of the Southern Paiutes in even worse conditions. Subsequent settlements of suits for compensating the Indians for their lands provided little more than temporary windfalls. Some reservations

were restored and have established various business enterprises with mixed success. Some vestiges of aboriginal culture have survived, but the language has largely died out. In 1980, it was recorded that only 124 Chemehuevi remained in California (Kelly and Fowler 1986: 391-392).

2.2.2.2 Vanyume

The Vanyume, a desert subdivision of the Serrano, are classified as belonging to the Takic linguistic branch, a subdivision of the Uto-Aztecan language family, and are considered to be a part of the Shoshonean or Takic migration into Southern California (Byrd 1996; Moratto 2004; Sutton 2005). Other Takic groups are the Kitanemuk, Gabrieleño, Luiseño, Cahuilla, and Cupeño. Reliable data are sparse for the Vanyume as they are often categorized as a desert-dwelling branch of the Serrano. The Vanyume were a small cultural group whose territory was along the Mojave River, located south of Fort Irwin. By the time of Spanish exploration, the entire population of the Vanyume may have ranged from 500 to 1,000 members. In addition to its occupation of the upper Mojave River drainage, the Vanyume or Desert branch of the Serrano appear to have occupied a substantial area within the western Mojave region. Vanyume territory extended from the eastern Mojave Desert through modern day Victorville and as far west as the city of Palmdale in the Antelope Valley (Bean and Smith 1978; Earle et al. 1998; O'Rourke 2005).

The subsistence practices of the Serrano were primarily composed of hunting and gathering within diverse ecological zones. The Vanyume practiced the same subsistence strategies as the Serrano and exploited the same resources; foods consumed included acorns and piñon nuts and other seeds from the foothills of the San Bernardino Mountains, yucca, mesquite, and cactus from desert environs, game (deer, rabbit, antelope, and other small mammals), and fish. The primarily desert-occupying Vanyume had resources available to them from outside of their territories through trade and networking with other Serrano groups who occupied areas in both the San Gabriel and San Bernardino Mountains (Bean and Smith 1978).

Settlement locations were dictated by water resources and villages tended to be based near streams, springs, and rivers, with village sizes ranging from 50 up to 100 people (Earle et al. 1998). Family dwellings were of the style encountered with many groups in southern California, constructed in a circular-domed fashion made of willow and tule. A central fire was located in each dwelling for heat and minor cooking, however, most domestic activities occurred out of doors. Other structures found in a Vanyume village would be composed of armadas, an unenclosed structure roofed with brush and a ceremonial house occupied by a village leader (Bean and Smith 1978).

The annual cycle of social, ceremonial, and economic activities of all Serranos was dictated by the seasonal availability of important subsistence resources (Earle et al. 1998). They engaged particularly in hunting, craft activities, and visiting during the winter months after the fall piñon and acorn harvests. Early spring was the period of greatest food scarcity during the year.

By the 1920s, the largest presence of the region's Native American inhabitants consisted of a small village near Victorville within traditional Vanyume territory. Census records indicate that the majority of individuals in this village identified themselves as "Pi Ute," while the remainder identified themselves as "Chimawaya" or not at all. Many Native Americans living in the vicinity of the village were not included in the census (Bloomberg 1987). In 2004, excavations at a village site near Palmdale unearthed several graves. Mitochondrial DNA matching established a direct link between one of these individuals to present day Vanyume still living in the Antelope Valley (O'Rourke 2005). Neighboring groups of the Vanyume were the Tataviam in the Santa Clarita Valley to the southwest, the Kitanemuk and Kawaiisu to the northwest near the Tehachapi Mountains, the Chemehuevi to the east, the Cahuilla to the south, other Serrano groups to the south-southwest, and the Gabrieliños to the west.

2.3 History

Generally, the Historic period begins with the first documented entrance by a European into a specific region; however, as a result of known contact in other parts of California by Russians, Chinese, Spanish, and Portuguese, some chronologies terminate the late prehistoric for all California in 1542, when the first

documented European entered the territory now known as California; this period, from first European emergence into “California” or the official documented European entrance into a region, is termed the Protohistoric. In 1542, Juan Rodriguez Cabrillo explored the California coast by ship, entering San Diego Bay and claiming Alta California for Spain. Cabrillo landed near Point Magu in the same year. Sixty years later, Sebastian Vizcaino sailed into the San Diego Bay. Exploration of the land was slower to come. Don Gaspar de Portola searched Alta California for suitable mission sites in 1769. Captain Juan Bautista de Anza, traveled a desert route to the Mission San Gabriel Arcangel from Mexico in 1774.

In California, the Historic era is generally divided into three periods: the Spanish or Mission Period (1769 to 1834), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

2.3.1 Spanish/Mission Period (1769 to 1834)

The Historic period in California began with the establishment of Spanish colonial military outposts, the first of which was Mission San Diego de Alcalá, built in 1769 by Junípero Serra. That same year, Gaspar de Portolá led an expedition through the coastal areas of southern California. The 1770s saw a number of expeditions and surveys travel across the desert areas of southern California. In 1772, Pedro Fages led a group across the western Mojave Desert along what would become the Old Spanish Trail while pursuing deserters from the San Diego Presidio (Beattie and Beattie 1939). The first recorded contact with Native Americans occupying the north central Mojave Desert was in 1776 by Father Garces during an exploration with Anza of the area along the Mojave Trail (Feller n.d.; Coombs et al. 1979: 20-21). The Old Spanish Trail, originally the Mojave Trail used by Native Americans, connected Villa Real de Santa Fe de San Francisco, now Santa Fe, and El Pueblo de Nuestra Señora La Reina de Los Ángeles, now Los Angeles, and traversed within the Fort Irwin area. Father Zalvidea crossed the trail in the early 1800s (Beattie and Beattie 1939) as he traveled the desert and baptized Native Americans. The Armijo expedition traveled from New Mexico to California, on what would later be termed the Old Spanish Trail, in 1829 searching for a suitable supply route.

During this period, 21 missions would be built in California, lined up from south to north along the El Camino Real. This period also introduced the era of Missionization, a period of forced conversion of the Native Americans who occupied the region. The Franciscans viewed the local populations to be composed of child-like individuals who would benefit from their European instruction and Christianization (We Are California 2008). Captured and removed from their villages, the indigenous peoples were brought to the missions and into servitude. Many perished from ill treatment, but more died because of the introduction of European diseases, ultimately devastating the Native American populations.

The last mission to be founded was San Francisco Solano in 1823; further attempts to construct additional missions were thwarted by Spain itself because of the costly endeavor each new mission posed. Later, as Spain lost its rule over New Spain and secularization was sought by the new government, the mission system was disbanded (Weber 2006).

2.3.2 Rancho Period (1821 to 1848)

Mexico became independent of Spain in 1821 and the Decree of Secularization, passed in 1834, effectively ended the Mission Period in California. The following years were marked by the proliferation of cattle ranching throughout the region, as the Mexican governor, Pío Pico, granted vast tracts of land to Mexican (and some American) settlers. The mission lands were then opened for grants by the Mexican government to citizens who would colonize the area and develop the land, generally for grazing cattle and sheep (Lech 2004). Travel along the Old Spanish Trail continued during this period and additional land surveys were conducted by explorers such as Kit Carson, Ewing Young, and Jedediah Smith (Beattie and Beattie 1939).

2.3.3 American Period (1848 to Present)

Following the signing of the Treaty of Guadalupe Hidalgo in 1848, the United States took possession of California. The treaty bound the United States to honor the legitimate land claims of Mexican citizens residing in captured territories. The Land Act of 1851 established a board of Land Commissioners to review these records and adjudicate claims, and it charged the Surveyor General with surveying confirmed land grants. In order to investigate and confirm titles of California, American officials acquired the provincial records of the Spanish and Mexican governments that were located in Monterey. Those records, most of which were transferred to the United States Surveyor General's Office in San Francisco, included land deeds and sketch maps (Gutierrez and Orsi 1998).

From 1852 to 1856, a board of Land Commissioners determined the validity of grant claims. The commissioners rejected many of the original rancho claims, which then became public domain and fair game for squatters. Ranch titles represented little as collateral. Although the claims of some owners were eventually substantiated, many of the owners lost their land through bankruptcy or the inability to meet the exorbitant interest on their legal debts. Many of the original rancho owners eventually lost their land to the United States.

Unsurveyed land boundaries created a loophole through which squatters could occupy plots on the fringes of land grants, and eventually come to own those plots through squatters' rights (Gutierrez and Orsi 1998).

2.3.4 Fort Irwin Project Vicinity

This section presents a brief summary of the history of the Fort Irwin area.

2.3.4.1 Trails and Roads

Bitter Springs and numerous other seasonal water sources are located within Fort Irwin. Because of the presence of Bitter Springs and other springs, the mostly undeveloped and open desert of the Fort Irwin region has been a thoroughfare to many prehistoric and historic travelers. Many trails traverse the area, segments of which were sometimes marked with rock cairns or creosote timbers. The majority of the trails, however, have no specific markers as most trails existed as routes between water sources. One significant prehistoric trail is located to the south of Fort Irwin, and that is the Mojave Trail, one of the most important of the Native American trail networks.

It was not until the discovery of the prehistoric trail systems, specifically the Mojave Trail, that Spanish exploration really began in the Mojave Desert. As a result of the travels of Father Garces through the region, road systems were developed. With that, the once unexplored region became connected to the rest of southern California.

The Spanish used the Mojave Trail alignment extensively and developed new corridors to new destinations from it. The trail network became an integral element as a trade route that connected Los Angeles to as far away as New Mexico; during this period, this road was known as the Santa Fe Road. In 1826, Jedediah Strong Smith, a fur trapper, traveled on the trail from east to west in and out of Utah (Fort Irwin n.d.). Early pioneers needing to travel through the area followed Smith; the area of Bitter Springs, located in the eastern boundary of Fort Irwin, has been documented as a regular stop by these travelers (Fort Irwin n.d.). This trail became a route for Mormon migration to and from Utah. It became known as the Mormon Road as well as the Salt Lake Road; this road connected Salt Lake City, Utah, with the San Bernardino Valley in California (Bureau of Land Management 2009; Smart 1988).

During the American period, the United States Topographical Corps, guided by Kit Carson, traversed the Old Spanish trail segment in the eastern Mojave and named it the Spanish Trail to acknowledge the use of the travel corridor since the first explorations of 1776 (Warren 2004). In 1844, Captain John C. Fremont and Kit Carson were traveling on the Spanish Trail in the Fort Irwin region as part of the first contingent of the Army to visit the area (Vredenburg 1994). In modern times, I-15 incorporated much of what was the Mojave/Spanish/Mormon trail alignments as did other modern freeways, highways, and roads.

2.3.4.2 Mining

This era was hallmarked by the first occupation of the region by the Americans. Mineral miners began to occupy areas of the Mojave after the California Gold Rush of 1849 (Earle et al. 1998). This era was also marked by military surveys of the American Southwest, and the beginning of geographical and ethnological studies (Powers 1877; Wheeler 1879). After the gold rush, the Spanish Trail was utilized as a road between Los Angeles and the Colorado River. Gold was found in San Bernardino County in the early 1850s and heralded an intensified use of the eastern Mojave for prospecting (Vredenburg 1995). The 1860s found mining success in the Mojave, but problems with the Native Americans and the isolation of the mines made it difficult for the mining industry to take hold.

Discovery of valuable ores in the mountains around the project area prompted several waves of miners, settlers, and merchants to move into the area and communities such as Daggett, the transportation center for the Calico mines, were founded. Silver and other valuable ores were discovered in the Fort Irwin region in 1882, specifically in Calico which lies 32 miles (51.50 kilometers) south of Fort Irwin, and borax was discovered in nearby Death Valley, turning the area that spans from Fort Irwin, south into Daggett and southwest to Barstow, into an important mining center (City of Barstow 2009; Shumway et al. 1980).

From the 1860s, mining activities have been conducted in pursuit of gold, silver, and minerals. Mining has survived as an economic practice in this part of the Mojave Desert well into modern times.

2.3.4.3 Railroad

In the late 1800s, railroad construction flourished. The Santa Fe and the San Francisco and Los Angeles railroads crossed at Barstow, formerly Waterman's Junction, by 1885 (Historical Marker Project 2015; Rollings-McDonald and Tuerpe 2008: 3). The Santa Fe and Salt Lake Railroad crosses through the town of Daggett, which was originally established during the heyday of the silver mines of the town of Calico.

It was not until early in the twentieth century that Southern California was connected to Salt Lake City by rail. Montana Senator William A. Clark intended to provide such a service, organizing the San Pedro, Los Angeles, and Salt Lake City Railroad in 1901 (Online Nevada Encyclopedia n.d.). That same year, he began buying local lines in the Los Angeles area and began surveying for new lines toward Utah. Clark was not the only one who wanted to build a railroad. Stiff competition raged during most of 1901 and 1902 between Clark and the Oregon Short Line, owned by Edward Henry Harriman. In January 1905, the Utah and California tracks were joined 23 miles (37.01 kilometers) south of Las Vegas (Las Vegas Railroad Society 2007).

Developments in transportation and mining were primary factors in the founding of the nearby town of Barstow. Since its creation, Barstow has been part of an important railroad network that webs into other regions of the United States.

2.3.4.4 Fort Irwin

The desert landscape of current Fort Irwin was designated for military training by President Franklin Roosevelt in 1940 as the Mojave Anti-Aircraft Range. This training facility occupied 1,000 square miles (640,000 acres or 258,999 hectares) and was a sub-post of Camp Haan in Riverside County. In 1942, Roosevelt renamed the facility Camp Irwin in honor of Major General George Leroy Irwin, who was the commander of the 57th Field Artillery Brigade in World War I (Fort Irwin n.d.). By 1944, Camp Irwin was deactivated and placed on surplus status. Camp Irwin remained on surplus status until the Korean War. Training resumed at Camp Irwin in 1951 as the Armored Combat Training Area. In 1961, Camp Irwin was named a permanent installation and the post was renamed Fort Irwin. Troops trained at Fort Irwin during the Vietnam conflict, but in 1971, the post was deactivated again. This time, however, the post was placed on maintenance status rather than surplus status, under the control of Fort MacArthur. During this period, it was used for training by units of the California National Guard. Fort Irwin was chosen as the site for the National Training Center in 1979 and was returned to active status in 1981 (Fort Irwin n.d.).

Study Methods and Results

This section provides the methods used by CH2M to guide the study. The methods were planned to meet or exceed the local, state, and federal requirements as well as *California Archaeological Resource Management Report* reporting guidelines and the Fort Irwin *Integrated Cultural Resources Management Plan* (ICRMP) (Fort Irwin 2011a).

3.1 Area of Potential Effects

As defined in 36 CFR 800.16(d) (Advisory Council for Historic Preservation, 1966 [amended 2004]), the APE is the geographic area or areas within which an undertaking may directly or indirectly have an effect on historic properties, if any such properties exist.

The construction limits/APE for this project encompasses 15 acres (six hectares) and includes the following components, as shown on Figure 1-2:

- The existing 50 RV sites would be provided with 20-foot by 40-foot (6.10-meter by 12.19-meter) concrete parking pads in addition to a 200-square-foot (18.58-square-meter) area of pavers to the right of the concrete pad that could be used for outdoor living or to park a towed vehicle.
- Construction of 59 additional RV parking sites that would include concrete parking pads, utility connections, a combination fire ring/grill, and individual picnic tables.
- Allowances for underground utility connection from the additional sites to utility primaries designed to accommodate peak season which include: potable water, fire water distribution (500 linear feet [152.40 linear meters]); a sanitary sewer line (5,000 linear feet [1,524.0 linear meters]); an electrical line (3,000 linear feet [914.4.0 linear meters]); and a fiber optic communications line (2,000 linear feet [609.60 linear meters]).
- Improvements to the RV Park expansion area to include enclosed dumpsters, xeriscaping, chain-link fencing, and construction of a LEED-certified 3,665-square-foot (340.49-square-meter) comfort station with showers, restrooms, a game room, kitchen/dining room, meeting room, and maintenance storage.
- Installation of a 1,000-gallon-capacity (3,785.41-liter-capacity) propane filling station and a 25-foot by 40-foot (7.62-meter by 12.19-meter) covered concrete pad with six concrete-filled pipe bollards.
- Installation of an approximately 200-square-foot (18.58-square-meter) pre-manufactured RV Park registration booth that would provide check-in, information, video surveillance, general paperwork, and cashiering services.

Sustainable features in the RV Park expansion would include a silver LEED-certified comfort station building, high-efficiency lighting controls, window films/shading structures, and a high-efficiency chiller.

Approximately 15 acres (six hectares) of land would be disturbed for expansion of the RV Park. The area of disturbance/APE, also referred to as the project area, is shown on Figure 1-2. Cement trucks and earth-moving equipment, such as bulldozers, backhoes, and dump trucks, would be used for construction.

All ground-disturbing activities would be confined within the construction limits/APE. No overland travel outside of the construction limits would be permissible.

The project is located within Fort Irwin, includes the existing RV Park, and is adjacent to a complex of old ammunition storage bunkers currently used to house excess organizational equipment; it also contains paved and dirt roads, utilities, and other installation features. The APE is under continuous use and exhibits vehicular disturbance both on established roads and off-road.

3.2 Literature Search

CH2M conducted a literature search of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC) on December 14, 2015. In addition, Fort Irwin archaeologists conducted a records search at the Fort Irwin Directorate of Public Works (DPW) Cultural Resources Library on March 29, 2016. The records search included a review of all recorded prehistoric and historic archaeological sites and historic architectural resources, as well as all known cultural resource survey and excavation reports of the study area that consisted of the project and a one-mile (1.6-kilometer) radius around the project area. Additionally, the NRHP, the California Register of Historic Resources (CRHR), California Historical Landmarks, and California Points of Historic Interest were all examined.

The following maps were reviewed to identify known historical land uses pertinent to the project site.

- 1856 *General Land Office Plat*, Department of the Interior
- 1892 *Official Map of San Bernardino County, California*, T.D. Beasley
- 1922 *Map of Southern California*, Scobey and Bowen
- 1957 *Trona, California* 15-minute USGS topographic quadrangle map
- 1960 *Trona, California* 15-minute USGS topographic quadrangle map

3.3 Literature Search Results

Review of the mapped data provided by SCCIC and Fort Irwin revealed that 18 previous cultural resources studies have been conducted within one mile (1.6 kilometers) of the project area and four studies have been previously conducted within the project's APE.

Table 3-1 lists all previous investigations conducted within the study area, which is composed of the APE and a one-mile (1.6-kilometer) radius.

TABLE 3-1

Cultural Resources Reports within One Mile (1.6 Kilometers) of the Project Area
Cultural Resources Inventory Report for the RV Park Expansion Plan, Fort Irwin, California

Authors and Date	Report Name	CHRIS Catalogue NADB Numbers
Fort Irwin Cultural Resources Program – 2002	Project DPW-021: 60 New Live Fire Targets	
Brewer, Harold – 2002	11 th ACR Stable Project/Main Gate Return POV Lane Project (DP-024)	
Fort Irwin Cultural Resources Program – 2003	Cultural Resources Inventory and Evaluation for the Anti-Terrorism Force Protection Project, Fort Irwin, the National Training Center (NTC), San Bernardino County, California	
Simmons, Carrie and Luz Ramirez de Bryson – 2004	Cultural Resources Inventory and Evaluation for the Fort Irwin & National Training Center (NTC) – Goldstone Water Treatment Plant, San Bernardino County, California	
Peter, Duane E., Marc W. Hintzman, Marcus Grant, Elizabeth Burson, Robin F. Bowers, Amelia M. Natoli, Heather J. Miljour, Tom Bullard, Christopher Lintz, Manuel Palacios-Fest, Robert Reynolds – 2004 ^a	Cultural Resources Inventory and Evaluation, Including Geomorphic and Paleontological Characterization, of the 210-km (130.5-mi) Central Corridor, Fiber Optic Network for Fort Irwin, National Training Center, California	
Shearer, J. – 2005	DPW-065: Ranges 5 and 7 Project Survey, Fort Irwin, California	

TABLE 3-1

Cultural Resources Reports within One Mile (1.6 Kilometers) of the Project Area*Cultural Resources Inventory Report for the RV Park Expansion Plan, Fort Irwin, California*

Authors and Date	Report Name	CHRIS Catalogue NADB Numbers
Grant, Marcus, Eugene Romanski, Tom Bullard, Christopher Lintz, and Duane E. Peter – 2005	Cultural Resources Inventory and Evaluation, Including Geomorphic Characterization, of the 200-km (124.5-mile) Fiber Optics Network, Phase II, Fort Irwin, National Training Center, California	
Brewer, Harold C. L. – 2006	Cultural Resource Inventory Report for the Impound Storage Yard Expansion Survey (DPW-074)	
Ramirez de Bryson, Luz – 2006 ^a	Cultural Resources Inventory and Evaluation of the Proposed Fiber Optic Line (FOL) from Fort Irwin, National Training Center to China Lake, Naval Air Weapons Stations' (NAWS) B Range, San Bernardino County, California	
McKenna, Jeannette – 2006	Results of a Class III Archaeological Survey for the Proposed Johnson Controls Fort Irwin NTC-CHP ECM Pipeline alternative Studies at Fort Irwin, San Bernardino County, California	7170
Anonymous – 2009	Water Treatment Plant and Barracks	7334
Belcourt, Tria Marie, Andrew Belcourt, Paula Sutton, Tiffany Newman, Angela B. McArdle, and Michael M. DeGiovine – 2010	Cultural Resources Annual Report – Volume I, August 2009-July 2010, Cultural Resources Survey and Inventory Reports	
Belcourt, Tria Marie, Andrew Belcourt, Tiffany Newman, and Michael M. DeGiovine – 2010	Cultural Resources Survey and Evaluation Report Annual 10,000-Acre Survey: 2010	
Comeau, Brad and Micah J. Hale – 2013 ^a	Archaeological Survey Report for the Fort Irwin Solar Project, Fort Irwin, San Bernardino County, California	
Fergusson, Aaron – 2014 ^a	Archaeological Resources Inventory Report for the Fort Irwin CIP Project W49 – Connect RV Park to Water System	
Yacubic, Matt – 2014	Range 6 Berm Improvement Project (FY14-194), Fort Irwin, San Bernardino County, California	
Burnett, Katherine L. – 2016	Cultural Resources Inventory and Evaluation for the Static Range Reconfiguration Project (FY15-303), Fort Irwin, San Bernardino County, California	
Burnett, Katherine L. – 2016	Cultural Resources Inventory and Evaluation for the North Tank Trail Stormwater Catchment Soil Testing Project (FY16-054), Fort Irwin, San Bernardino County, California	

Sources: SCCIC of CHRIS (2015); Fort Irwin DPW (2016).

NADB = National Archaeological Database

CHRIS = California Historical Resources Information System

^aReports which intersect the APE

Nineteen previously recorded sites and six isolated finds are located within the one-mile (1.6-kilometer) study buffer and no cultural resources have been previously recorded within the APE. Of the sites in the study area, all have been evaluated as not eligible, as recommended by the cultural investigator, for inclusion in the NRHP. Isolated finds, by their definition, lack the data potential for inclusion in the NRHP. Table 3-2 lists all the previously recorded sites and isolates within the study area.

TABLE 3-2

Cultural Sites within One Mile (1.6 Kilometers) of the Project Area*Cultural Resources Inventory Report for the RV Park Expansion Plan, Fort Irwin, California*

Sites within One-Mile (1.6-Kilometer) Radius			
Site Number	Site Type	Site Description	Evaluation CRHR/ NRHP Year
P-36-000432	Prehistoric	Quarry	Not eligible/2012
P-36-010320	Prehistoric	Lithic scatter	Not eligible/1998
P-36-010321	Prehistoric	Lithic scatter	Not eligible/1998
P-36-010690	Prehistoric	Quarry	Not eligible/2012
P-36-011521	Prehistoric	Lithic scatter	Not eligible/2002
P-36-011522	Prehistoric	Lithic scatter	Not eligible/2002
P-36-011523	Prehistoric	Lithic scatter	Not eligible/2002
P-36-011524	Prehistoric	Lithic scatter	Not eligible/2002
P-36-011532	Prehistoric	Lithic scatter	Not eligible/2002
P-36-011536	Prehistoric	Lithic scatter	Not eligible/2002
P-36-011546	Prehistoric	Lithic scatter	Not eligible/2003
P-36-011547	Prehistoric	Lithic scatter	Not eligible/2003
P-36-011548	Prehistoric	Lithic scatter	Not eligible/2003
P-36-011549	Prehistoric	Lithic scatter	Not eligible/2003
P-36-011550	Prehistoric	Lithic scatter	Not eligible/2003
P-36-011556	Prehistoric	Quarry	Not eligible/2005
P-36-011725	Prehistoric	Lithic scatter/quarry	Not eligible/2003
P-36-011726	Prehistoric	Lithic scatter/quarry	Not eligible/2003
P-36-012035	Prehistoric	Lithic scatter	Not eligible/2005
Isolates			
P-36-025906	Prehistoric	Isolate	Not eligible/2012
P-36-025907	Historic	Isolate	Not eligible/2012
FINTC-NH-ISO-2	Historic	Isolate	Not eligible/2013
303-ISO-001	Prehistoric	Isolate	Not eligible/2016
303-ISO-002	Prehistoric	Isolate	Not eligible/2016
RED-054-ISO-001	Prehistoric	Isolate	Not eligible/2016

Sources: CHRIS North Central Information Center; Fort Irwin DPW.

There are no historic districts or cultural landscapes within the study area. No known cultural resources are within the area that may be affected by project activities.

3.4 Native American Consultation

The record search conducted at the SCCIC and the DPW at Fort Irwin did not indicate the presence of Native American traditional cultural properties. Fort Irwin is conducting government-to-government consultation with affiliated tribes on the possible effects of the proposed project.

3.5 Field Inventory Methodology

The fundamental goals of a pedestrian survey are to identify and document previously unrecorded cultural resources and to analyze cultural materials, not only to better characterize potential project effects, but also to attempt to confirm or elaborate on our current understanding of the prehistory and history of the region. From a management perspective, the ability of specific resources to address research questions provides a basis to evaluate CRHR and NRHP eligibility. CH2M archaeologists Gloriella Cardenas and Natalie Lawson completed the intensive pedestrian survey of the APE on December 15, 2015.

Survey methodology for prehistoric and historic archaeological resources was performed using pedestrian transects spaced at 32.8- to 49.2-foot (10- to 15-meter) intervals throughout the APE. The APE was surveyed for cultural resources by visually inspecting the ground surface and subsurface exposures, including rodent burrows and cut banks. Ground surface visibility was generally excellent at 80 to 100 percent in the RV park expansion area but decreased to less than 20 percent along the stormwater corridor as this part of the APE was largely paved. The survey was conducted by navigating via a Trimble Geo XH global positioning system, which contained survey area shape files.

For Fort Irwin site identification and recordation, the ICRMP states (Appendix C, Section 3.1):

Fort Irwin will record archaeological sites based on the presence of midden or significant features, or at least three classes of prehistoric artifacts, e.g., flakes, modified flakes, bifaces, projectile points, cores, ceramics, and/or historic artifact classes, e.g., domestic, military, and architecture, or the presence of at least 20 cultural items within a 10 meter radius. Isolates are those occurrences of artifacts totaling less than 30 items in a 20 meter radius. All sites will be recorded on California Department of Parks and Recreation forms. Small sites or isolates within close proximity (30 meters) of a site may be loci within a larger site and so recorded under the judgment of the person in charge in the field. Site record forms will include information on vicinity isolates. Isolates are individual cultural items such as unmodified or modified flakes, bifaces, or potsherds.

3.6 Field Inventory Results

The general geomorphologic environment for the project area is one of alluvial deposition, as the project is primarily located within an alluvial basin. Sediment in the majority of the project area was composed of highly permeable unconsolidated alluvium and aeolian sand. Ground surface visibility was generally excellent at 80 to 100 percent throughout the project site but decreased to 20 percent along the stormwater corridor as it was largely paved. Overall, the project site has a low archaeological sensitivity, and subsurface deposits are not expected because of the geomorphology of the APE consisting of a deflationary environment, not a depositional one. Additionally, active alluvial channeling, vehicle and recreational use, utilities, and maintenance of roads have disturbed large portions of the APE. Representative photos are included in Appendix A.

One isolated artifact was discovered within the APE as a result of this investigation. Temporary CH-IF-01 is a single chalcedony flake. Isolates by their definition lack the data potential for eligibility in the NRHP. Therefore, the isolate is not significant and is not a historic property for the purposes of Section 106. DPR forms for this find are included in Appendix B.

3.7 Management Considerations

No archaeological or historic sites were discovered as a result of this investigation. With regard to the proposed action, no further work is recommended and CH2M recommends a finding of “No Historic Properties Affected” in accordance with 36 CFR 800.4(d)(1). As with any ground-disturbing project, there remains some theoretical potential for the discovery of buried cultural resources not detected through a surface inventory. If cultural resources or archaeological materials are discovered during ground-disturbing activities, the work near the discovery should cease, and the area should be protected until the find can be evaluated by a qualified archaeologist.

If historic properties are discovered or unanticipated effects on historic properties are found in the APE after the Section 106 process has been completed, the Army will comply with the post-review discovery procedures pursuant to 36 CFR 800.13(b)(1), (2), or (3), as appropriate. The Army will suspend work in the area and notify the Cultural Resources Manager and staff in the DPW, Environmental Division in order to determine the appropriate action.

SECTION 4

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Appendix A
Project Photographs



Photograph 1. Survey/RV Park expansion area, view to the north.



Photograph 2. Survey area of linear segment/corridor, view north.



Photograph 3. Linear survey segment, view east.

Appendix B
CONFIDENTIAL DPR Forms

The site record is confidential and has been removed from this EA.

Appendix C
Native American Consultation Letters



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Gerald Howard
Chairman
Bishop Paiute Tribe
50 Tu Su Lane
Bishop, CA 93514

Dear Mr. Howard,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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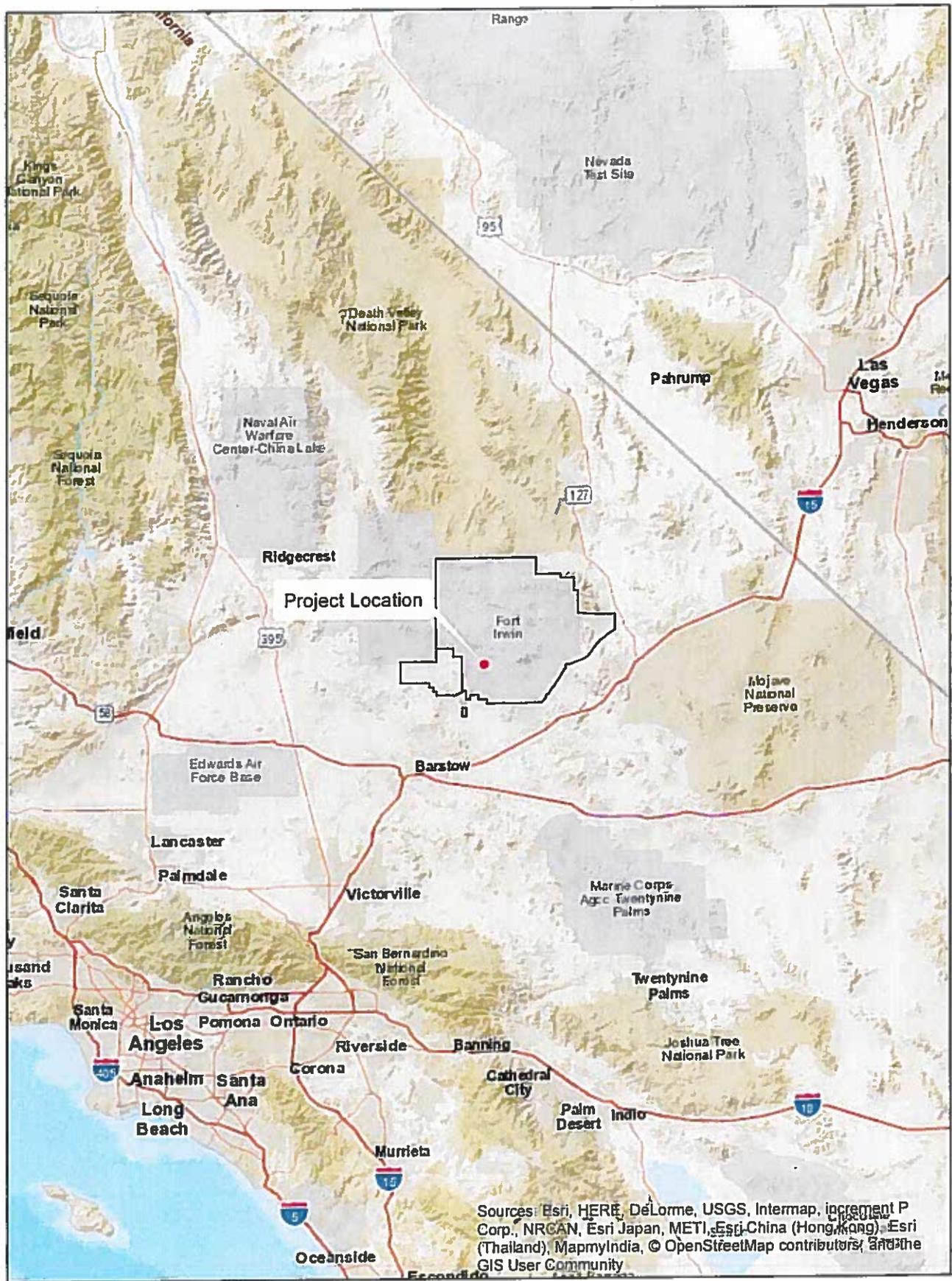
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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Legend

 Fort Irwin Boundary

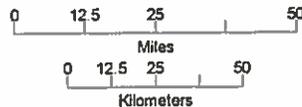


FIGURE 1-1
Vicinity Map
RV Park Expansion
Fort Irwin, CA



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Dennis Patch
Chairman
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344

Dear Mr. Patch,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure

CF: Ms. Wilene Fisher-Holt
Director, Colorado River Indian Tribes



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. George Gholson
Chariman
Timbisha Shoshone Tribe
621 W. Line Street, Suite 109
Bishop, CA 93514

Dear Mr. Gholson,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure

CF: Ms. Barbara Durham
Tribal Historic Preservation Officer, Timbisha Shoshone Tribe



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Luther Salgado Sr.
Chairman
Cahuilla Band of Mission Indians
52701 Hwy 371
Anza, CA 92539-1760

Dear Mr. Salgado,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Robert Martin
Chairman
Morongo Band of Mission Indians
12700 Pumarra Road
Banning, CA 92220-2965

Dear Mr. Martin,

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Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure

CF: Mr. Raymond Huaute
Cultural Resource Specialist, Morongo Band of Mission Indians



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Ms. Shannon Romero
Chairwoman
Big Pine Paiute Tribe of Owens Valley
P.O. Box 700
Big Pine, CA 93513

Dear Ms. Romero,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Director of Public Works
USAG Fort Irwin, CA

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Ms. Wendy Stine
Chairwoman
Fort Independence Reservation
P.O. Box 67
Independence, CA 93526

Dear Ms. Stine,

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This undertaking consists of the construction of the following components within the 15 acre (six hectares) construction limit/APE. The existing 50 RV sites would be upgraded by constructing 20 ft. x 40 ft. 3.2 ft. (6.10 m x 12.19 m x 1 m) concrete parking pads, in addition to a 200-square-foot (18.58-square-meter) area of pavers to the right of the concrete pad, for each site. 59 additional RV parking sites will be constructed that would include concrete parking pads, utility connections, a combination fire ring/grill, and individual picnic tables. Underground utility connections from each site to utility primaries include: potable water/fire water distribution (500 ft./152.4 m long); sanitary sewer line (5000 ft./1524 m long); electrical line (3000 ft./914.4 m long); and a fiber optic communications line (2,000 ft./609.6 m long). Width for all trenching activities will not exceed 9.8 ft. (3 m) with a maximum depth of 13.1 ft. (4 m). Improvements to the RV Park expansion area also include chain-link fencing and the construction of a 3,665 ft² (340.49 m²) comfort station. Campground fuel will be provided to occupants via a 1,000 gallon (3,785.41 liter) propane filling station on a 25 ft. x 40 ft. x 3.2 ft. (7.6 m x 12.1 m x 1 m) covered concrete pad with six concrete-filled pipe bollards. An approximately 200 ft² (18.5 m²) pre-manufactured RV Park registration booth will be installed within the construction limit/APE as well. Cement trucks and earth-moving equipment, such as bulldozers, backhoes, and dump trucks, would be used for construction. All ground-disturbing activities would be confined within the construction limits/APE. Access to the site will be via existing paved/dirt roads.

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Ms. Lynn Valbuena
Chairwoman
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92346

Dear Ms. Valbuena,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Doug Wemas
Chairman
Cabazon Band of Mission Indians
84-245 Indio Springs Drive
Indio, CA 92203

Dear Mr. Wemas,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Charles Wood
Chairman
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, CA 92363

Dear Mr. Wood,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Director of Public Works
USAG Fort Irwin, CA

Enclosure



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Mr. Timothy Williams
Chairman
Fort Mojave Indian Tribe
500 Merriman Ave
Needles, CA 92363

Dear Mr. Williams,

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure

CF: Ms. Nora McDowell
Cultural Resources Coordinator, Fort Mojave Indian Tribe
Ms. Linda Otero
Director, Fort Mojave Indian Tribe



DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON
BLDG 237, B AVE, P.O. Box 105021
FORT IRWIN, CA 92310-5000

July 20, 2016

Subject: RV Park Expansion Plan (FY16-1002), Fort Irwin, California

Ms. Mary Wuester
Chairperson
Lone Pine Paiute Shoshone Reservation
P.O. Box 747
Lone Pine, CA 93545

Dear Ms. Wuester,

The purpose of this letter is to inform you of an Undertaking, as defined by the National Historic Preservation Act of 1966 (as amended) (NHPA) at Fort Irwin, located in San Bernardino County, California. The US Army proposes to renovate, modernize, and expand the Fort Irwin RV Park by upgrading a pervious surface with gravel for RV parking, constructing concrete RV parking pads, constructing support and recreational facilities buildings, and extending utility lines such as sewer, water, and power.

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Sincerely,



Muhammad A. Bari, P.E.
Director of Public Works
USAG Fort Irwin, CA

Enclosure

Appendix D
Record of Non-applicability and Air Quality
Emissions Calculations

RECORD OF NON-APPLICABILITY (RONA) FOR GENERAL CONFORMITY

NAME OF PROJECT: RV Expansion Plan Ft. Irwin, CA

PROJECT ID NUMBER: _____

POINT OF CONTACT: Mark Burns

PHONE/EMAIL: 760.380.3737 / mark.a.burns20.civ@mail.mil

START DATE: 2017

General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of the rule are not applicable to this project/action because:

The project/action qualifies as an exempt action under. The applicable exemption citation is 40 CFR 93.153:

OR

Total direct and indirect emissions from this project/action have been estimated at *(only include information for the applicable pollutants)*:

0.873 _____ tons/yr of NOx

0.127 _____ tons/yr of VOC

0.0535 _____ tons/yr of PM10

0.967 _____ tons/yr of carbon monoxide (CO)

0.00160 _____ tons/yr of sulfur dioxide (SO2)

These levels are below the conformity threshold values established at the 40 CFR 93.153 (b), **AND** this project/action is not considered regionally significant under 40 CFR 93.153 (i).

Supporting documentation and emission estimates are:

Attached Environmental Assessment for the RV Expansion Plan

Appear in NEPA Documentation _____ *(cite reference)*

Other _____ *(cite reference)*

Environmental Coordinator *(Title and Signature)*
CFR 93.153

BURNS.MARK.A.1079354380

Digitally signed by
BURNS.MARK.A.1079354380
DN: c=US, o=U.S. Government, ou=DoD,
ou=PKJ, ou=USA,
cn=BURNS.MARK.A.1079354380
Date: 2016.08.03 09:29:53 -07'00'

Date

Ft. Irwin - RV Park Expansion
San Bernardino-Mojave Desert County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	0.00	User Defined Unit	15.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	32
Climate Zone	10			Operational Year	2018
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Assumed that 15 acres will be disturbed.

Construction Phase - Assumed dates of phases.

Off-road Equipment - Assumed equipment.

Trips and VMT - Mobile emissions calculated using CARB's EMFAC model.

Land Use Change - The site's 15 acres are currently in use as an RV park / desert scrub land. Following the project, the entire 15 acres will be in use as an RV park.

Sequestration -

Construction Off-road Equipment Mitigation - Values adjusted to reflect mitigation measures.

Mobile Land Use Mitigation -

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	90
tblConstructionPhase	NumDays	30.00	35.00
tblConstructionPhase	NumDays	300.00	30.00
tblConstructionPhase	NumDays	20.00	35.00
tblConstructionPhase	PhaseStartDate	2/18/2017	2/20/2017
tblConstructionPhase	PhaseStartDate	4/1/2017	4/3/2017
tblConstructionPhase	PhaseStartDate	5/13/2017	5/15/2017
tblLandUse	LotAcreage	0.00	15.00
tblLandUseChange	CO2peracre	0.00	4.31
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators

tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00

2.0 Emissions Summary

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	0.0000
Vegetation Land Change	-64.6500
Total	-64.6500

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/2/2017	2/17/2017	5	35	
2	Trenching	Trenching	2/20/2017	3/31/2017	5	30	
3	Construction	Building Construction	4/3/2017	5/12/2017	5	30	
4	Paving	Paving	5/15/2017	6/30/2017	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 15.31

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	1	7.00	174	0.41
Trenching	Trenchers	1	7.00	80	0.50
Trenching	Excavators	1	7.00	162	0.38
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Construction	Other Construction Equipment	1	7.00	171	0.42
Construction	Rubber Tired Dozers	1	7.00	255	0.40
Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Pavers	1	7.00	125	0.42
Paving	Other Construction Equipment	1	7.00	171	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Construction	3	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

- Use Soil Stabilizer
- Replace Ground Cover
- Water Exposed Area
- Clean Paved Roads

3.5 Paving - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0152	0.1683	0.1082	1.6000e-004		8.6700e-003	8.6700e-003		7.9700e-003	7.9700e-003	0.0000	15.1443	15.1443	4.6400e-003	0.0000	15.2417
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0152	0.1683	0.1082	1.6000e-004		8.6700e-003	8.6700e-003		7.9700e-003	7.9700e-003	0.0000	15.1443	15.1443	4.6400e-003	0.0000	15.2417

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000							

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.433723	0.068979	0.183157	0.159578	0.045778	0.007720	0.006780	0.077795	0.000831	0.001129	0.010289	0.000587	0.003654

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-64.6500	0.0000	0.0000	-64.6500

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Others	15 / 0	-64.6500	0.0000	0.0000	-64.6500
Total		-64.6500	0.0000	0.0000	-64.6500

10.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Summary of Construction Related Emissions

Activities	Emissions for 2017 (tons/yr)						
	CO	VOC	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO _{2e}
RV Park Expansion	0.518	0.0745	0.781	0.000660	0.0443	0.0403	67.9
Vehicles - RV Park Expansion	0.450	0.0522	0.0912	0.000938	0.00917	0.00632	96.5
Tiefert City	16.9	2.04	16.5	0.0264	1.12	0.916	2,503
Ft. Irwin - MEDCOM	5.05	0.507	3.17	0.00952	0.638	0.278	851
Transmission Pipeline Replacement - Phase 5 (W52)	0.640	0.0813	0.667	0.00115	0.0401	0.0358	
Total, Construction Emissions, ton/year	23.56	2.755	21.21	0.0387	1.852	1.276	3,518

Note: Construction emissions are cumulative of all projects anticipated to occur in 2017.

Summary of Construction Related Emissions

Activities	Emissions for 2017 (tons/yr)						
	CO	VOC	NO_x	SO₂	PM₁₀	PM_{2.5}	CO2e
RV Park Expansion	0.518	0.0745	0.781	0.000660	0.0443	0.0403	67.9
Vehicles - RV Park Expansion	0.450	0.0522	0.0912	0.000938	0.00917	0.00632	96.5
Total, Construction Emissions, ton/year	0.967	0.127	0.873	0.00160	0.0535	0.0466	164.4

