Final

Environmental Assessment for Construction, Operation, and Decommissioning of a Solar Photovoltaic System at Marine Air Ground Task Force Training Command Marine Corps Air Ground Combat Center Twentynine Palms, California

November 2015

Prepared for:
United States Department of the Navy and United States Marine Corps

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DEPARTMENT OF DEFENSE
UNITED STATES MARINE CORPS
FINDING OF NO SIGNIFICANT IMPACT FOR PROPOSED CONSTRUCTION, OPERATION, AND DECOMMISSIONING OF A SOLAR PHOTOVOLTAIC SYSTEM AT THE MARINE AIR GROUND TASK FORCE TRAINING COMMAND, MARINE CORPS AIR GROUND COMBAT CENTER, TWENTYNINE PALMS, CALIFORNIA

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U. S. Code §§ 4321-4370h); and United States Marine Corps (USMC) procedures for implementing NEPA, as described in Marine Corps Order P5090 2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual,* the USMC gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the Proposed Construction, Operation, and Decommissioning of a Solar Photovoltaic (PV) System at the Marine Air Ground Task Force Training Command (MAGTFTC), Marine Corps Air Ground Combat Center (MCAGCC) located at Twentynine Palms, California (herein referred to as the Combat Center). Based on the analysis provided in the EA, I have selected Alternative 3 and find that it will not have a significant impact on the human environment, and, therefore, an EIS is not required.

Background: This EA has been prepared to evaluate the potential environmental impacts associated with Proposed Construction, Operation, and Decommissioning of a Solar Photovoltaic System located in the Mainside area of the Combat Center. The purpose of the Proposed Action is to increase installation energy security, operational capability, strategic flexibility and resource availability through the development of renewable energy generation assets at USMC and Department of the Navy (DoN) installations by the construction and operation of a solar PV system at the Combat Center. The Proposed Action is required to meet the renewable energy standards put forth by the 1 Gigawatt Initiative and the Secretary of the Navy Energy Goals. Under the Proposed Action, the DoN and a private partner would enter into an agreement to allow the private partner to use DoN land to construct, operate, and own the proposed solar PV system. The partner would sell the generated power to regional customers and/or the DoN. The private partner would be responsible for maintenance, operation, and the eventual decommissioning of the solar PV system as well as in-kind consideration in an amount not less than fair market value. The policy requirements for energy security and increased production of energy from alternative sources by 2020 are addressed in part by including a requirement that project infrastructure be "micro-grid ready," (i.e. DoN would have the option to use energy produced on-installation in the event of an area power outage).

Proposed Action: Under the Proposed Action/Alternative 1, a 241-acre site would support the construction and operation of an up to 57 megawatt solar PV system. A new, 2.6-mile long electrical line and switching metering facilities would connect the proposed solar PV site to the civilian grid. The solar PV system, transmission line, and facilities would be located within the Combat Center boundary.

Alternatives: The EA evaluates the Proposed Action/Alternative 1, Alternative 2, Alternative 3 (Preferred Alternative), and the No Action Alternative. Under Alternative 2, all of the actions under Proposed Action/Alternative 1 would occur, with the only difference being that the new transmission line would be 2.9 miles long. Both Alternatives 1 and 2 involve shared use of at least some of the Combat Center's existing power poles. Under Alternative 3, all of the actions proposed under Proposed Action/Alternative 1 would occur, the only difference being no shared use of Combat Center power poles. Instead 0.24 mile of transmission line would be located outside of the Combat Center's boundary and that portion would require separate environmental review. Under

the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center.

Summary of Environmental Impacts: The EA analyzes the potential environmental impacts associated with implementation of the Proposed Action/Alternative 1, Alternative 2, Alternative 3 and the No-Action Alternative. The resources most likely to be affected by this action are biological resources, geological resources, water resources, cultural resources, air quality, and utilities. Conversely, impacts to the following resources were considered to be negligible or non-existent and were not further analyzed in the EA: airspace, land use, aesthetics, recreation, hazardous materials and wastes, transportation, noise, socioeconomics and environmental justice, and public health and safety/protection of children. Implementation of the selected alternative (Alternative 3) will not result in significant environmental impacts. The proposed action will have negligible direct, indirect, or cumulative impacts on the quality of the local environment and will comply with all regulatory requirements. All proposed construction activities will be done in accordance with the Avoidance and Impact Minimization Measures/Special Conservation Measures listed in Section 2.5 of the EA. A Record of Non-Applicability for Clean Air Act General Conformity requirements has been prepared and approved for this project. Cumulative effects of the proposed action in combination with other past, present, or reasonably foreseeable future actions would not be significant.

Findings: There will not be any disproportionately high and adverse human health or environmental effects from the proposed action on minority and low-income populations. There will not be any impacts on the protection of children from environmental health and safety risks.

The EA and FONSI addressing this action are on file, and interested parties may obtain a copy from: NREA Division, Building 1418, MAGTFTC, MCAGCC, Twentynine Palms, California, 92278. Direct telephone inquiries to Mr. Scott Kerr at (760) 830-8190. A limited number of copies of the EA are available to fill single-copy requests.

2015 11 16

Date

LEWIS A. CRAPAROTTA
Major General, United States Marine Corps

List of Acronyms and Abbreviations

%	percent
AB	Authorized Biologist
ac	acre(s)
ac-ft	acre-feet
AC	alternating current
APLIC	Avian Power Line Interaction Committee
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Safety and Health Administration
CalEEMod	California Emissions Estimator Model
CAISO	California Independent System Operators
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CWA	Clean Water Act
dB	decibels
DC	direct current
DoD	Department of Defense
DoN	Department of the Navy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ES	Executive Summary
ESA	Endangered Species Act
ESTCP	Environmental Security Technology Certification Program
FCR	Field Contact Representative
FONSI	Finding of No Significant Impact
ft	foot/feet
FY	fiscal year
GHG	greenhouse gas
GW	gigawatt(s)
ha	hectare(s)
HAPs	Hazardous Air Pollutants
HEPA	high efficiency particulate air
km	kilometer(s)
kV	kilovolt(s)
m	meter(s)
MAGTFTC	Marine Air Ground Task Force Training Command
MBTA	Migratory Bird Treaty Act
MCAGCC	Marine Corps Air Ground Combat Center
MCAS	Marine Corps Air Station
MCCES	Marine Corps Communication and Electronic School
MCO	Marine Corps Order
$\mu g/m^3$	micrograms per cubic meter
mg/m^3	milligrams per cubic meter
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MILCON	Military Construction
MW	megawatt(s)
N_2O	nitrous oxide
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAVFAC	Naval Facilities Engineering Command
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NOA	Notice of Availability
NREA	Natural Resources and Environmental Affairs
NRHP	National Register of Historic Places
O_3	ozone
ppm	parts per million
PV	photovoltaic
REPO	Renewable Energy Program Office
ROI	region of interest
RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison
SCM	Special Conservation Measure
SECNAV	Secretary of the Navy
SELF	Strategic Expeditionary Landing Field
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
TBD	to be determined
TOC	Table of Contents
UC	University of California
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USMC	U.S. Marine Corps
VOC	volatile organic compound

ENVIRONMENTAL ASSESSMENT

Lead Agency: United States Department of the Navy
Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California

Title of Proposed Action: Proposed Construction, Operation, and Decommissioning of a Solar Photovoltaic System at Marine Corps Air Ground Combat Center, Twentynine Palms, California

Affected Region: San Bernardino County, California

Designation: Environmental Assessment

Abstract

This Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts resulting from the construction, operation, and decommissioning of a solar photovoltaic (PV) system in the Mainside area at Marine Air Ground Task Force Training Command (MAGTFTC), Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California (herein referred to as the "Combat Center" or the "installation"). This EA has been prepared by the United States (U.S.) Department of the Navy (DoN) and the U.S. Marine Corps in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code §§ 4321-4370h); Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); DoN procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order P5090.2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual*. Marine Corps Installations Command is the action proponent for this project.

Under the Proposed Action, the DoN and a private partner would enter into an agreement to allow the private partner to use DoN land to construct, operate, and own the proposed solar PV system. The partner would sell the generated power to regional customers. The private partner would be responsible for maintenance, operation, and the eventual decommissioning of the solar PV system. The EA analyzes the Proposed Action, two alternatives, and the No Action Alternative. This EA includes a detailed analysis of the Proposed Action's potential environmental impacts on the following resources: biological resources, geological resources, water resources, cultural resources, air quality, and utilities.

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts resulting from the construction, operation, and decommissioning of a solar photovoltaic (PV) system in the Mainside area at Marine Air Ground Task Force Training Command (MAGTFTC), Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California (herein referred to as the "Combat Center" or the "installation").

This EA has been prepared by the United States (U.S.) Department of the Navy (DoN) and the U.S. Marine Corps in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code §§ 4321-4370h); Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); DoN procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order (MCO) P5090.2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual*. Marine Corps Installations Command is the action proponent for this project.

The purpose of the Proposed Action is to increase DoN installation energy security, operational capability, strategic flexibility and resource availability through the development of renewable energy generation assets at DoN installations by the construction and operation of a solar PV system at the Combat Center. The Proposed Action is required to meet the renewable energy standards put forth by the 1 Gigawatt Initiative and the Secretary of the Navy Energy Goals. The policy requirements for energy security and increased production of energy from alternative sources by 2020 are addressed in part by including, in any potential agreement (or real estate outgrant) entered into by the DoN and a private partner, a requirement that project infrastructure be "micro-grid ready," meaning that the DoN would have the option to use any energy produced on-installation in the event of an area power outage or other circumstances.

Alternatives to the Proposed Action must be considered in accordance with NEPA, CEQ regulations for implementing NEPA, and MCO P5090.2A. However, only those alternatives determined to be reasonable relative to their ability to fulfill the purpose of and need for the Proposed Action require detailed analysis. This EA analyzes the Proposed Action, two alternatives, and the No Action Alternative. Other action alternatives were considered but were not carried forward for analysis in this EA because they failed to satisfy the reasonable alternative screening criteria and, therefore, do not meet the purpose of and need for the Proposed Action. Although the No Action Alternative is not a viable alternative, it is evaluated in this EA as required by NEPA and CEQ regulations.

This EA includes a detailed analysis of the Proposed Action's potential environmental impacts on the following resources: biological resources, geological resources, water resources, cultural resources, air quality, and utilities. Cumulative effects of the Proposed Action, in combination with other past, present, or reasonably foreseeable actions, were also analyzed. A summary of environmental consequences for each alternative by resource area is presented in Table ES-1. No significant impacts were identified for any of the alternatives.

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Biological Resources	Approximately 241 acres (ac) (97 hectares [ha]) of sparsely vegetated land on the eastern portion of Mesquite Dry Lake mapped as urban and playa habitat would be directly impacted. Wildlife and special status species, namely the desert tortoise and Mojave fringe-toed lizard, would potentially be exposed to direct and indirect impacts. However, with implementation of Avoidance and Impact Minimization Measures and Special Conservation Measures (SCMs) listed below, the Proposed Action/Alternative 1 is not likely to incidentally take or otherwise adversely affect desert tortoises, and effects to Mojave fringe-toed lizards and other wildlife species and their populations would be less than significant. Per the Basewide Biological Opinion, with the implementation of the proposed Impact Minimization Measures and SCMs, consultation with the United States (U.S.) Fish and Wildlife Service (USFWS) is not necessary. Monitoring of the solar photovoltaic (PV) site would be conducted to assess any potential negative effects to migratory birds and other species. Therefore, implementation of the Proposed Action/Alternative 1 would have less than significant impacts to biological resources.	Impacts to biological resources under Alternative 2 would be nearly identical to those under the Proposed Action/Alternative 1. Alternative 2 would be implemented in accordance with the same Avoidance and Impact Minimization Measures and SCMs as the Proposed Action/Alternative 1. Therefore, implementation of Alternative 2 would have less than significant impacts to biological resources.	Impacts to biological resources under Alternative 3 would be nearly identical to those under the Proposed Action/Alternative 1. Alternative 3 would be implemented in accordance with the same Avoidance and Impact Minimization Measures and SCMs as the Proposed Action/Alternative 1. Therefore, implementation of Alternative 3 would have less than significant impacts to biological resources.	Under the No Action Alternative, the Department of the Navy (DoN) would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center. Therefore, implementation of the No Action Alternative would have no impact to biological resources.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **BR-1.** If construction or decommissioning activities occur during the recognized avian breeding season (1 February through 30 September), construction would occur in accordance with the Migratory Bird Treaty Act (MBTA) to avoid impacts to nesting migratory birds. Specifically, a biologist approved by the Combat Center's Natural Resources and Environmental Affairs (NREA) office would survey the proposed project area for nesting birds prior to activities. If the biologist finds an active nest, construction workers would not directly or indirectly disturb the			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	nest or adjacent areas until the biologist determines the nest is no longer in use. • **BR-2.** The private partner would construct all transmission towers, poles, and lines in accordance with the guidelines in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006), or the most current version of the guidelines available at the time of construction, and in *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012). • **BR-3.** An NREA-approved Authorized Biologist (AB) would be present during the initial groundbreaking during the construction and decommissioning phases and would conduct a clearance survey to ensure no tortoises are in the area. A tortoise exclusion fence would be constructed around the PV site and would remain in place for the duration of the construction and decommissioning phases. Temporary exclusion fencing would be built around the construction/decommissioning area for each steel tower that would support the new transmission lines. The NREA-approved AB would inspect the fence line of the tortoise exclusion fencing at least once every two weeks and within 24 hours of any rain event. • **BR-4.** Per the Basewide Biological Opinion, if a tortoise is found in the action area during ground breaking activities, all ground breaking activities must halt until NREA is contacted and NREA processes the tortoise and authorizes ground-breaking activities to resume. Following construction/decommissioning, the temporary tortoise fencing would be removed. • **BR-5.** An NREA-approved AB would be "on-call" during construction in case a desert tortoise is encountered. The DoN and private partner would provide NREA the names and qualifications of AB candidates, with ultimate approval coming from the USFWS and NREA. • **BR-6.** The private partner would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fence is installed. The FCR would be responsible for overseeing compliance with biological resources conservation measures. The FCR would be on-site during all project activities. The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation of these measures. An NREA representative would make bi-weekly visits to ensure compliance. • **BR-7.** Before the start of construction activities, all personnel within the project work areas, including all participating agency employees, construction and maintenance personnel, and others who implement authorized actions, would receive worker training that includes the NREA-provided Environmental Awareness Training about desert tortoises, cultural resources, hazardous materials and hazardous wastes. • **BR-8.** All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project area to reduce the attractiveness of the area to common ravens (*Corvus corax*) and other predators. Any trash receptacles used for waste storage would be equipped with latching/locking lids. The FCR would be responsible for ensuring that trash is removed regularly from the project area, and that the trash containers are kept securely closed when not in use. • **BR-9.** Vehicle speed limits within the project area and along access roads would not exceed 20 miles (32 kilometers [km]) per hour. Speed limits would be clearly marked by the private partner, and workers would be			measures/SCMs are proposed.

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	made aware of these speed limits. Vehicles parked outside of exclusion fencing would be inspected underneath for desert tortoises immediately before the vehicle is moved. If a desert tortoise is found under a vehicle, the vehicle would not be moved, NREA would be contacted immediately, and the tortoise would be monitored for its safety until NREA processes the tortoise. • **BR-10.** Should a dead or injured tortoise be located on-site at any time, the NREA would be notified immediately. In the case of an injury to a tortoise, NREA will contact USFWS immediately to decide the appropriate course of action. In the case of a dead tortoise, NREA will telephone and notify the USFWS within three days of the finding, and written notification within 15 days of the finding. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information. • **BR-11.** The permanent security fence around the solar PV site would be contiguous to the permanent desert tortoise exclusion fence to prevent tortoises from burrowing under the fence. • **BR-12.** Monthly monitoring surveys would be conducted at the PV site by an NREA-approved biologist to assess use of the area by wildlife, vegetation changes, and potential bird/bat mortalities and/or injuries. In addition, project personnel working onsite would also record wildlife use of the project area. Results of the surveys and the data collected by project personnel would be provided to the NREA in quarterly reports for comments and recommendations to minimize impacts from continuing operations. • **BR-13.** If federally-listed species (e.g., desert tortoises) are observed in the project area during construction/decommissioning activities and/or during operation of the solar PV system, NREA will be notified immediately for further instructions, which may ultimately require USFWS instructions. The NREA would also be notified immediately if a dead or injured bird protected by the MBTA is found on-site at any time, or if any incidents occur that may affect the health and safety of project personnel (e.g., locating a rattlesnake within the project area). • **BR-14.** A revegetation and seeding plan approved by the NREA would be implemented following decommissioning activities to restore the site to pre-project conditions. • **BR-15.** An NREA-approved biological monitor would survey the solar PV site for mammals, reptiles, and/or nesting birds prior to decommissioning activities. If nesting or denning animals are found to occur in the solar PV sites, they would be allowed to leave the sites on their own accord or would be passively relocated during the avian non-breeding season (October – January) prior to the start of decommissioning activities. If federally-listed species are found to occur in the solar PV site prior to the start of decommissioning activities, then activities will halt, NREA will be contacted, and the private partner would plan further action to avoid take of the listed species. • **BR-16.** The private partner would prepare and submit a Weed Management Plan to the NREA for review and approval. Once approved, the private partner would be responsible for implementing the Weed Management Plan.			

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Geological Resources	The Proposed Action/Alternative 1 is located in relatively flat areas that are not susceptible to landslides. The geology and topographic features of the project area would not be substantially altered and the project would not result in the loss of availability of a known mineral resource or fossils. With implementation of Avoidance and Impact Minimization Measures and SCMs listed below, erosion would be minimized during construction through adherence to the Combat Center's Stormwater Pollution Prevention Plan (SWPPP) and facilities would be designed to accommodate poor drainage and high shrink-swell soils in Mesquite Dry Lake and potential geologic hazards. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to geological resources.	Impacts under Alternative 2 would be similar to those described under the Proposed Action/Alternative 1, with the exception of impacts associated with the portion of the proposed Alternative 2 transmission line alignment that would be located along Mesquite Dry Lake. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to geological resources.	Impacts under Alternative 3 would be similar to those described under Alternative 2, except that the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to geological resources.	Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center and construction activities would not occur. Baseline geological conditions would remain unchanged. No impacts to geological resources would occur as a result of implementation of the No Action Alternative.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **GR-1.** The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities. • **GR-2.** A geotechnical study would be performed by professional civil or geotechnical engineers or engineering geologists licensed in the State of California and would provide design and construction recommendations, as appropriate, to reduce potential impacts associated with soil conditions and geologic hazards. The project would incorporate the recommendations identified by the geotechnical study and the proposed facilities associated with the project would be designed to accommodate for soil conditions and geologic hazards. *Note: specific dust control measures are included in the Air Quality summary.*			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Water Resources	There are no waters of the U.S. under the jurisdiction of the U.S. Army Corps of Engineers (USACE) located within the Proposed Action/Alternative 1 project area. Construction of transmission lines would not permanently alter or affect existing drainage patterns. Construction within the 100-year flood zone associated with Mesquite Dry Lake would be in compliance with Executive Order (EO) 11988, as amended. With implementation of Avoidance and Impact Minimization Measures and SCMs listed below, erosion would be minimized during construction through adherence to the Combat Center's SWPPP and impacts to the Mesquite Dry Lake 100-year flood zone would be minimized. Transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater. The private partner would be responsible for identifying and contracting with one or more local water districts to purchase the water required for Alternative 1. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to water resources.	Impacts under Alternative 2 would be similar to those described under the Proposed Action/Alternative 1. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to water resources.	Impacts under Alternative 3 would be similar to those described under the Proposed Action/Alternative 1. In addition, the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to water resources.	Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center and construction activities would not occur. Baseline conditions of water resources, as described in Section 3.3.3, would remain unchanged. No impacts to water resources would occur as a result of implementation of the No Action Alternative.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **WR-1.** The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities. • **WR-2.** To minimize impacts within a 100-year flood zone, all excess soils and construction debris would be			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	removed from the flood zone following construction. In addition, project facilities would be decommissioned and removed and the 100-year flood zone would be restored to pre-construction conditions at the end of the agreement term. • **WR-3.** To reduce impacts to groundwater, reclaimed water would be used as much as possible for dust control. • **WR-4.** To reduce water requirements for dust control, it is expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads. • **WR-5.** Transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater.			measures/SCMs are proposed.
Cultural Resources	No National Register of Historic Places (NRHP)-eligible archaeological, architectural, or traditional cultural resources have been identified in the area of potential effect. As such, no cultural resources occur within the area of potential effect. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the California State Historic Preservation Office (SHPO) (refer to Appendix E), implementation of the Proposed Action/Alternative 1 would not affect cultural resources and impacts would be less than significant.	Impacts to cultural resources under Alternative 2 would be similar to those described above for the Proposed Action/ Alternative 1. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the SHPO (refer to Appendix E), implementation of the Alternative 2 would not affect cultural resources and impacts would be less than significant.	Impacts to cultural resources under Alternative 3 would be similar to those described above for the Proposed Action/ Alternative 1. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the SHPO (refer to Appendix E), implementation of the Alternative 3 would not affect cultural resources and impacts would be less than significant.	Under the No Action Alternative, the proposed PV, transmission line, and associated infrastructure would not be constructed, and existing conditions would remain unchanged. Therefore, there would be no impacts to cultural resources with implementation of the No Action Alternative.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **CR-1.** The private partner would be responsible for preparing and implementing a Monitoring and Discovery Plan prior to construction, and archaeological monitoring would be required during all ground disturbing activities. A monitoring summary report would be completed at the end of the monitoring. • **CR-2.** If cultural resources are found during ground-disturbing activities associated with this project, work would stop and the NREA Cultural Resources Manager would be contacted immediately.			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Air Quality	Estimated emissions associated with the Proposed Action/ Alternative 1 would be below the *de minimis* levels for Clean Air Act (CAA) Conformity. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to air quality.	Estimated emissions associated with Alternative 2 would be below the *de minimis* levels for CAA Conformity. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to air quality.	Estimated emissions associated with Alternative 3 would be below the *de minimis* levels for CAA Conformity. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to air quality.	Under the No Action Alternative, no construction activities would occur, and the existing air quality environment would not be affected. Therefore, there would be no impacts to air quality.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: General Measures • **AQ-1.** Proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within design standards. • **AQ-2.** Construction vehicle engines (non-road diesel engines) would conform to U.S. Environmental Protection Agency Tier 4 emission standards, when applicable. Dust Control Measures • **AQ-3.** In conjunction with measure AQ-16, the private partner would prepare a Dust Abatement Plan/Health and Safety Plan related to airborne dust that would be reviewed by the Combat Center and approved by the San Bernardino County Department of Public Health and the Mojave Desert Air Quality Management District (MDAQMD) prior to commencing any construction activities. This plan would cover all project phases (construction, operations, and decommissioning) as well as abandonment post-decommissioning and would include, but not be limited to, the avoidance and minimization measures listed below. The Dust Abatement Plan/Health and Safety Plan would also be reviewed and updated as needed to prevent dust from leaving the site. • **AQ-4.** The project would minimize the amount of ground disturbance to the greatest extent possible (e.g., by designing the project to minimize both grading and trenching). • **AQ-5.** Water trucks or sprinkler systems would be used in quantities sufficient to prevent airborne dust from leaving the site. Watering frequency would be increased whenever wind speeds exceed 15 mph. Non-potable water would be used whenever possible. • **AQ-6.** All dirt stockpile areas would be covered (e.g., with tarps). • **AQ-7.** Exposed ground areas that are planned to be reworked at dates more than one month after initial grading may be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established. All disturbed soil areas not subject to revegetation would be stabilized using chemical soil binders (e.g., polymeric stabilizers), jute netting, or other methods approved in advance by the MDAQMD. Specific details would be provided in the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3). Chemical soil binders, jute			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	netting, and any other methods implemented to control dust would be inspected and maintained per the manufacturer's recommendations throughout all project phases (construction, operations, and decommissioning) to ensure efficacy of the dust control method is maintained. In addition, inspection and maintenance activities would also be performed after any substantial events (e.g., large wind, dust, or rain storms) or as requested by the Combat Center. • **AQ-8.** Paving (e.g., for roadways, driveways, sidewalks, etc.), would be completed as soon as possible. In addition, building pads would be laid as soon as possible after grading unless seeding or soil binders are used (see measure AQ-7). • **AQ-9.** Vehicle speed for all construction/decommissioning vehicles would not exceed 15 mph on any unpaved (i.e., without asphalt) surface at the project site. • **AQ-10.** All trucks hauling dirt, sand, soil, or other loose materials would be either covered or loaded such that at least 2 feet of freeboard (minimum vertical distance between top of load and top of trailer) is maintained in accordance with California Vehicle Code Section 23114. • **AQ-11.** Either wheel washers would be installed where vehicles enter or exit unpaved roads from or onto streets, or trucks and equipment leaving the site would be washed. • **AQ-12.** Streets would be swept at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water would be used where feasible. • **AQ-13.** All measures to reduce fugitive dust and Valley Fever exposure would be shown on grading and building plans. • **AQ-14.** The private partner would designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent (%) opacity, and prevent transport of dust offsite. Monitors would have the authority, and responsibility, to cease construction/decommissioning activities (particularly soil-disturbing activities) during conditions that prevent adequate dust control (e.g., heavy wind or dust storms). Their duty hours would include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons would be provided to the Combat Center and the MDAQMD Compliance Division prior to the start of any grading, earthwork or demolition. • **AQ-15.** The private partner would ensure more water truck capacity and faster response to dusty conditions when needed. When visible dust exceeds 20% opacity on-site, or water trucks cannot sufficiently dampen the soil to suppress the dust, workers would be moved out of the area and/or additional employee protection would be provided. Note that the 20% opacity criteria may not provide sufficient worker protection as infection may be caused by inhalation of a very low number of spores, e.g., 10 or less. <u>Measures to Reduce Exposure to Valley Fever from Airborne Dust</u> • **AQ-16.** While developing the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3), the private partner would consult with the San Bernardino County Public Health Department and the California Occupational Safety and Health Administration (Cal/OSHA) to ensure that it minimizes the potential for exposure to Valley Fever.			

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	Avoidance and minimization measures included in the Plan would be based on the best available standards at the time of review. The Plan would also include a program to evaluate the potential for exposure to Valley Fever from all project phases (construction, operations, decommissioning) and abandonment post-decommissioning and would include a protocol for monitoring ambient air for spores that cause Valley Fever if Valley Fever is found within the project area (see AQ-17). • **AQ-17.** Prior to commencing construction activities, the private partner would test the proposed project's soil for the fungus that causes Valley Fever to more clearly characterize the potential level of risk that the site might contain Valley Fever. Soil testing would be performed in the location(s) on the site identified by the subject matter experts as most likely to contain spores that cause Valley Fever. The testing protocol would be based on the best available standards at the time of testing. In any event, the testing protocol would be one that is reliable; as of September 2015, there are two protocols that meet this criteria (Barker 2015, Lauer 2015). If the result of any test sample is positive for Valley Fever, sensors would be utilized during project construction to monitor ambient air conditions at and around the project site for spores that cause Valley Fever. In conjunction with AQ-16, the protocol (e.g., the number of sensors, the type of sensors, and their placement) for this monitoring effort would be described in the Dust Abatement Plan/Health and Safety Plan. • **AQ-18.** Prior to commencing construction activities, the private partner would provide funding for offsite dust control/mitigation for expected dust emissions during the operational phase. Specifically, the private partner would develop and implement or fund a program for offsite mitigation of fugitive dust from existing sources at the Combat Center and surrounding communities (e.g., the City of Twentynine Palms) and would initiate this program such that the emission reduction project(s) are in place prior to commencing operation. Specific strategies and actual funding levels would be refined based on the final engineering and emission levels remaining after implementation of the operational portion of the Dust Abatement Plan/Health and Safety Plan. The private partner would provide the Combat Center and San Bernardino County with evidence of an MDAQMD-approved strategy, as well as evidence of complete funding, prior to commencing construction activities.			
Utilities	The Proposed Action would be sited within a reasonable proximity to interconnection facilities, and the energy generated by the Proposed Action would contribute to the Secretary of the Navy's initiative to generate power that would go into the civilian grid, a beneficial impact. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to utilities.	Under Alternative 2, utilities impacts would be similar to but less than those described under the Proposed Action/ Alternative 1, since the proposed transmission line under Alternative 2 would be located away from existing utilities for the majority of the proposed transmission route. This would also reduce the amount of construction work involving operational, or "hot," power	Under Alternative 3, utilities impacts would be similar to but less than those described under the Proposed Action/ Alternative 1, since the proposed transmission line under Alternative 3 would be located away from existing utilities for the majority of the proposed transmission route. This would also eliminate the need for construction work involving operational, or "hot," power	Under the No Action Alternative, the proposed PV, transmission line, and associated infrastructure would not be constructed, and existing conditions would remain unchanged. Therefore, there would be no impacts to utilities with implementation of the No Action Alternative.

Table ES-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
		transmission lines. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to utilities.	transmission lines. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to utilities.	
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **UT-1.** To avoid design and construction conflicts with the Combat Center's internal utility network, a utility investigation would be conducted to obtain the exact depth and location of underground utilities (i.e., natural gas lines, wastewater lines, potable and non-potable water lines). • **UT-2.** Special consideration would be required for transmission pole replacement at the front of the wastewater detention ponds and during PV site construction near the existing overhead line. • **UT-3.** To avoid interrupting Combat Center operations, work along the entire transmission line would be completed while the existing power lines are operational, or "hot." • **UT-4.** The private partner would be responsible for: o adhering to conditions for application processes established by the California Independent System Operator, Southern California Edison (the local electrical utility), Federal Energy Regulatory Commission, and other entities, which include an application for interconnection, a systems impact study, and a facility study; and o off-installation utility upgrades required by the local utility for carrying the PV power, if necessary. • **UT-5.** The private partner would be responsible for obtaining the necessary water. It is expected that this water would come from one or more of the three nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District). The private partner would also be responsible for shipping the water to the project site via truck.			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Notes: BR = Biological Resources; GR = Geological Resources; WR = Water Resources; CR = Cultural Resources; AQ = Air Quality; UT = Utilities.

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ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION, OPERATION, AND DECOMMISSIONING OF A SOLAR PHOTOVOLTAIC SYSTEM AT MARINE AIR GROUND TASK FORCE TRAINING COMMAND MARINE CORPS AIR GROUND COMBAT CENTER TWENTYNINE PALMS, CALIFORNIA

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CHAPTER 1
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION AND BACKGROUND

This Environmental Assessment (EA) has been prepared by the United States (U.S.) Department of the Navy (DoN) and the U.S. Marine Corps (USMC) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] §§ 4321-4370h); Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); DoN procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order (MCO) P5090.2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual*. This EA analyzes the potential environmental impacts resulting from the construction and operation of a solar photovoltaic (PV) system in the Mainside area at Marine Air Ground Task Force Training Command (MAGTFTC), Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California (herein referred to as the "Combat Center" or the "installation"). This project is one of several renewable energy projects the DoN is currently evaluating within the Renewable Energy Program Office (REPO) Southwest area of responsibility. Marine Corps Installations Command is the action proponent for this project.

The purpose of the Proposed Action is to increase DoN installation energy security, operational capability, strategic flexibility and resource availability through the development of renewable energy generation assets at DoN installations by the construction and operation of a solar PV system at the Combat Center. The Proposed Action is required to meet the renewable energy standards put forth by the 1 Gigawatt (GW) Initiative and the Secretary of the Navy (SECNAV) Energy Goals. The policy requirements for energy security and increased production of energy from alternative sources by 2020 are addressed in part by including, in any potential agreement (or real estate outgrant) entered into by the DoN and a private partner, a requirement that project infrastructure be "micro-grid ready," meaning that the DoN would have the option to use any energy produced on-installation in the event of an area power outage or other circumstances.

1.1.1 Secretary of the Navy Renewable Energy Goals and Strategies

1.1.1.1 Goals

In October 2009, the SECNAV established renewable energy goals for the DoN's shore based installations to meet by 2020. These goals include:

1. The DoN will produce or procure at least 50 percent (%) of the total quantity of electric energy consumed by shore-based facilities and activities each fiscal year (FY) from alternative energy sources.
2. Fifty percent of DoN installations will be net zero (i.e., over the course of a FY, an installation matches or exceeds the electrical energy it consumes ashore with electrical energy generated from alternative energy sources) (DoN 2012).

1.1.1.2 Strategies

The DoN's energy strategy is centered on energy security, energy efficiency, and sustainability while remaining the pre-eminent maritime power.

- Energy security is critical to mission success. Energy security safeguards our energy infrastructure and shields the DoN from a volatile energy supply.

- Energy efficiency increases mission effectiveness. Efficiency improvements minimize operational risks while saving time, money, and lives.
- Sustainable energy efforts protect mission capabilities. Investment in environmentally responsible technologies afloat and ashore reduces greenhouse gas (GHG) emissions and lessens dependence on fossil fuels (DoN 2015).

The SECNAV has established a goal for the DoN to develop one GW of renewable energy generation capacity by the year 2020 (DoN 2012). The DoN has developed acquisition strategies based on the following three separate models (Figure 1-1) to procure or generate renewable energy to meet the SECNAV's goals:

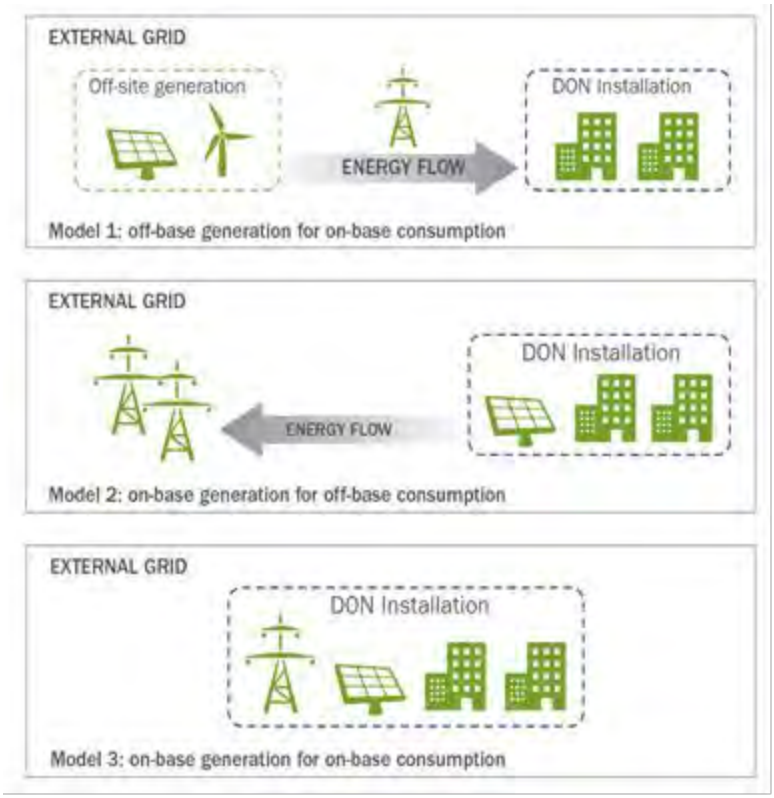


Figure 1-1 Renewable Energy Models

Model 1: Off-base generation for on-base consumption:

- DoN purchases new renewable energy generation for on-base load
- Renewable energy generation provides price stability and diversifies energy portfolio
- Acquisition: Inter-agency Agreement

Model 2: On-base generation for off-base consumption:

- Private partner produces on DoN property & exports energy to grid (allows for much higher capacity of product versus Model 3)
- DoN to receive energy security via lease terms
- Acquisition: Real estate outgrant

Model 3: On-base generation for on-base consumption:

- DoN consumes all energy generated
- Price stability and diversifies energy portfolio
- Acquisition: Power Purchase Agreement

The Combat Center already has a very large co-generation/micro-grid demonstration system, which is a key component of a micro-grid; this system includes 16 megawatts (MW) of natural gas cogeneration and over 5 MW of solar PV that provides for the vast majority of the Combat Center's electricity requirements. As such, the DoN proposes to implement Model 2 at the Combat Center to support achievement of the SECNAV's goals while simultaneously augmenting the existing co-generation/micro-grid system.

Under Model 2, the DoN and a private partner would enter into a 37-year agreement to allow the private partner to use DoN land to construct, operate, and own the PV systems. Once the systems are operational, the private partner would sell the power to regional customers. The private partner would be responsible for maintenance, operation, and the eventual decommissioning of the solar PV system.

1.1.2 Solar PV Systems

Solar PV technology uses solar cells to convert energy from direct and diffused solar radiation into electricity. The basic unit in a PV system is a solar cell made up of semiconductor material that absorbs solar radiation and converts it to an electrical current. Solar cells are contained within solar modules that are assembled into solar panels. A series of panels comprises a solar array. Solar PV systems generate direct current (DC) electricity, which is converted to alternating current (AC) for transmission on the electrical grid and ultimate end-use in AC form. The conversion from DC to AC occurs at a power conditioning station that contains inverters. The power is transferred via a transmission line and substation to the nearest point of connection to the utility grid.

Solar PV systems are comprised of hundreds and sometimes thousands of individual solar PV panels. The vast majority of the solar PV market uses Flat Plate PV technology. In this design, the manufacturer arranges the cells on a flat panel, sandwiches the cells between a transparent encapsulant and a thin backing sheet of polymer, and then tops the cells with a layer of tempered glass that allows light to reach the PV cells. An anti-reflective coating covers this top layer so more light can be absorbed by each cell (Office of Energy Efficiency and Renewable Energy 2013a, 2013b).

The most common commercial PV module is approximately 77 inches (2 meters [m]) long by 39 inches (1 m) wide in size and weighs about 40 pounds (18 kilograms) (Brightstar Solar 2014). Often, sets of four or more smaller modules are framed or attached together by struts in what is called a panel. Panels could be mounted on posts bored into the ground, on concrete foundations, or on concrete blocks placed on the ground and are typically mounted between 3 feet (ft) to 5 ft (1 m to 2 m) above the ground. PV panels are either tilted on fixed foundations (Photo 1) or on fixed foundations that allow the panels to rotate (e.g., single-access tracking) (Photo 2). Fixed, non-tracking panels are more likely to be considered for relatively flat areas, such as the proposed project area, to reduce construction cost; single access tracking panels are more likely to be considered on slopes for maximum efficiency.

Solar PV energy projects generally require 10 acres (ac) (4 hectares [ha]) to produce 1 MW of power. However, with the relatively high solar radiation values and favorable climate conditions at the Combat Center, it is assumed that this proposed project would require approximately 7 ac (2.8 ha), or less (depending on the type of PV panel selected), to generate 1 MW of power.

Photo 3 presents an existing solar PV system at the Combat Center. This solar PV system covers approximately 6.5 ac and generates approximately 1.1 MW of power (National Renewable Energy Laboratory 2012).

Photo 1. Typical Fixed-Tilt PV Panels

Photo 2. Typical Single-Access Tracking PV Panels

Photo 3. Existing Solar PV System at the Combat Center, Twentynine Palms

1.1.3 History and Mission of the Combat Center

The Combat Center is the world's largest Marine Corps installation and houses the premier training center for live-fire practice. Nearly one-third of the Fleet Marine Force and Marine Reserve units participate in the installation's training exercise program each year. These training exercises include a variety of

weapons systems, from small arms to attack aircraft, and are essential in maintaining the high levels of readiness required of the USMC to fight and defend U.S. national interests.

The mission of the Combat Center is to conduct relevant live-fire combined arms training, urban operations, and joint/coalition-level integration training that promote operational forces readiness and to provide facilities, services, and support in response to the needs of resident organizations, Marines, Sailors, and their families – both now and in the future. Significant commands at the installation include the Marine Corps Communications-Electronics School, 7th Marine Regiment, Combat Service Support Group-1, Air Ground Support Element, Headquarters Battalion, Training and Education Command, and Naval Hospital (Naval Facilities Engineering Command [NAVFAC] Southwest 2011).

1.2 PROJECT LOCATION

The Combat Center is located in the Mojave Desert approximately 130 miles (209 kilometers [km]) east of Los Angeles and 54 miles (87 km) northeast of Palm Springs in San Bernardino County, California (refer to Figure 1-2). The southern boundary of the installation is located approximately 6 miles (10 km) north of Highway 62, and the northern boundary is located south of Interstate 40. The City of Twentynine Palms is adjacent to the southern boundary of the installation. The Combat Center is the Marine Corps' only combined arms live-fire and maneuver training range complex. It encompasses approximately 705,200 ac (285,400 ha) and is composed of multiple training areas, restricted areas, and the Mainside cantonment area. The majority of the Combat Center is undeveloped and devoted to combined arms live-fire and maneuver training activities.

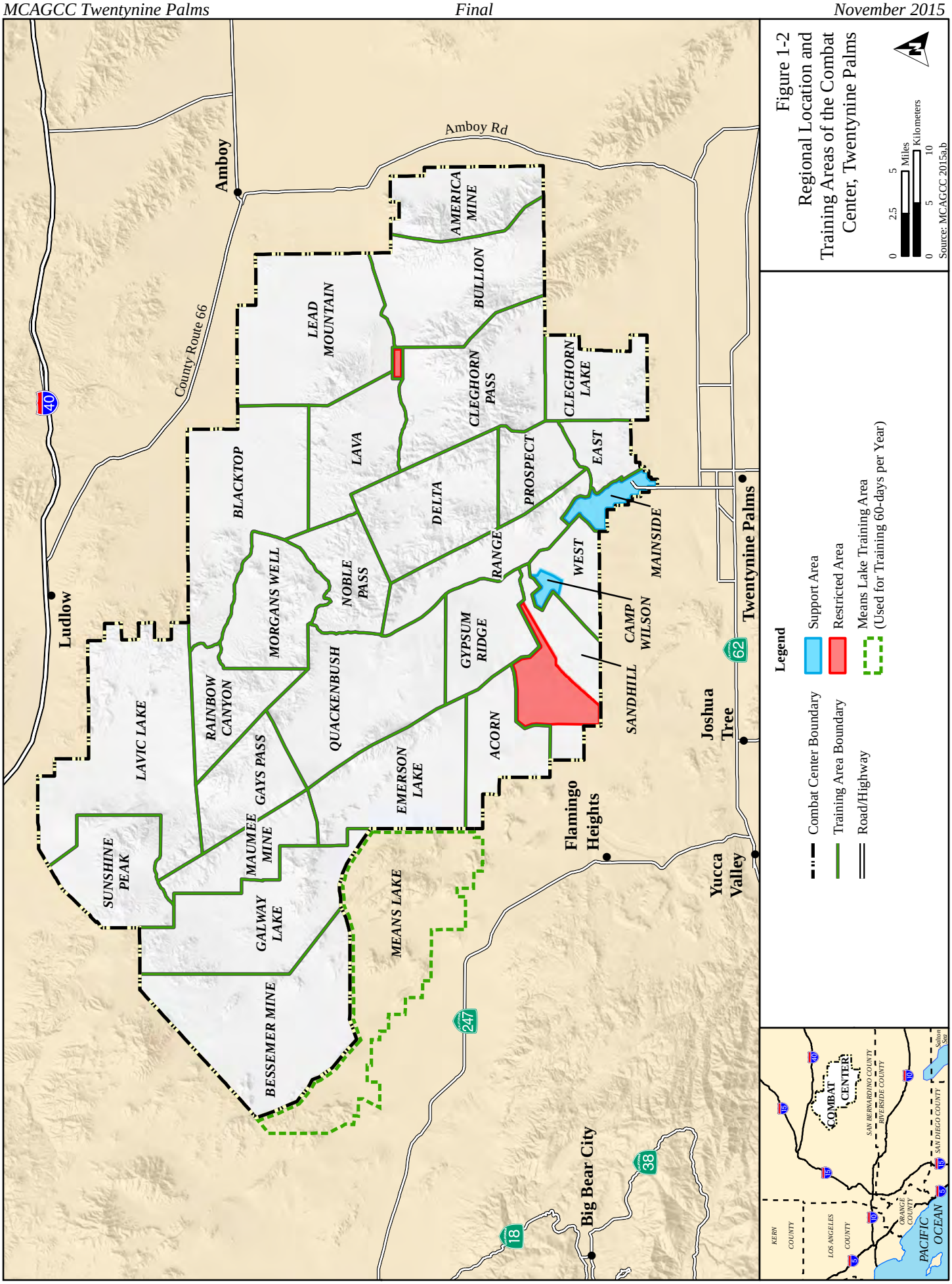
The Proposed Action would be located within the Mainside area, which is located in the southernmost portion of the installation and is the primary developed area on the installation, providing an array of maintenance, storage, administrative, commercial, and housing facilities.

1.3 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to increase DoN installation energy security, operational capability, strategic flexibility and resource availability through the development of renewable energy generating assets at DoN installations by the construction and operation of a solar PV system at the Combat Center. The Proposed Action is needed to meet the renewable energy standards put forth by the 1 GW Initiative and the SECNAV Energy Goals. The policy requirements for energy security and increased production of energy from alternative sources by 2020 are addressed in part by including, in any potential agreement (or real estate outgrant) entered into by the DoN and a private partner, a requirement that project infrastructure be "micro-grid ready," meaning that the DoN would have the option to use any energy produced on-installation in the event of an area power outage or other circumstances.

1.4 DECISION TO BE MADE

The decision to be made as a result of the analysis in this EA is to decide if an Environmental Impact Statement (EIS) needs to be prepared. An EIS will need to be prepared if it is determined that the Proposed Action or other alternative ultimately selected for implementation would have significant impacts to the human or natural environment. Should an EIS be deemed unnecessary based on the effects analysis of the alternative selected for implementation, this selection would be documented in a Finding of No Significant Impact (FONSI).


Amboy
Amboy Rd
County Route 66
Ludlow
Twentynine Palms
Joshua Tree
Yucca Valley
Flamingo Heights
Big Bear City
AMERICA MINE
LEAD MOUNTAIN
BULLION
CLEGHORN PASS
CLEGHORN LAKE
BLACKTOP
LAVA
DELTA
PROSPECT
EAST
MAINSIDE
WEST
CAMP WILSON
SANDHILL
RANGE
GYPSUM RIDGE
NOBLE PASS
MORGANS WELL
QUACKENBUSH
ACORN
EMERSON LAKE
RAINBOW CANYON
GAYS PASS
LAVIC LAKE
SUNSHINE PEAK
MAUMEE MINE
GALWAY LAKE
BESSEMER MINE
MEANS LAKE
Legend
Combat Center Boundary
Training Area Boundary
Road/Highway
Support Area
Restricted Area
Means Lake Training Area
(Used for Training 60-days per Year)
Figure 1-2
Regional Location and
Training Areas of the Combat
Center, Twentynine Palms
0 2.5 5 Miles
0 5 10 Kilometers
Source: MCAGCC 2015a,b
KERN COUNTY
LOS ANGELES COUNTY
ORANGE COUNTY
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
SAN DIEGO COUNTY
COMBAT CENTER
PACIFIC OCEAN
Salton Sea

1.5 SCOPE OF ANALYSIS

1.5.1 Previous Studies

A 2012 study by the Department of Defense (DoD) Environmental Security Technology Certification Program (ESTCP) analyzed the potential for solar energy development at seven military installations in the Mojave and Colorado deserts (DoD ESTCP 2012). The study determined that, at the Combat Center, Mainside is the only location where solar energy could be developed without impacting the Combat Center's mission. The study also identified several areas at Mainside that could be suitable for such development.

The 2012 study was followed by a 2014 Feasibility Study (DoN and USMC 2015) that determined that only one area – the proposed solar PV system site – met all of the screening factors as described in Section 2.1 of this EA. The Feasibility Study also determined the maximum output the proposed sites could produce; evaluated the existing utility transmission system to determine a probable point of interconnection, and identified potential project-related risks and constraints by resource. The results of the 2014 Feasibility Study are integrated into this EA.

1.5.2 Resources Analyzed in Detail

As described and evaluated in Chapter 3, this EA analyzes the following resource areas in detail:

- Biological Resources
- Geological Resources
- Water Resources
- Cultural Resources
- Air Quality
- Utilities

1.5.3 Resources Not Analyzed in Detail

Airspace, land use, aesthetics, recreation, hazardous materials and wastes, transportation, noise, socioeconomics and environmental justice, and public health and safety/protection of children were not carried forward for detailed analysis because the Proposed Action would not affect or would only negligibly affect these resources. The rationale for not carrying these resources forward for detailed analysis is summarized below and further discussed in Chapter 3.

Airspace – The Proposed Action would not affect airspace because it would have an anti-reflective coating that would improve light absorption and reduce or eliminate the potential for glint and glare impacts. Furthermore, the proposed project would be located outside of the established Special Use Airspace, Class-D Restricted Airspace, and restricted areas. Therefore, no significant impacts to airspace would occur with implementation of the Proposed Action.

Land Use – Although the Proposed Action would be partially located within the Twentynine Palms city boundary (Figure 1-3), the Proposed Action would be located on federal land, would not change or modify existing land uses, and would be compatible with adjacent land use. The Proposed Action is not required to comply with City of Twentynine Palms Ordinance 249 because it would be located on federal land, and access to the site by the general public is restricted. Therefore, the proposed project would not affect the use of any off-installation lands and would not adversely impact the City of Twentynine Palms' rural and scenic character, small town sense of community, economy, recreational and cultural opportunities, tax revenue, or overall quality of life. Therefore, no significant impacts to land use would occur with implementation of the Proposed Action.

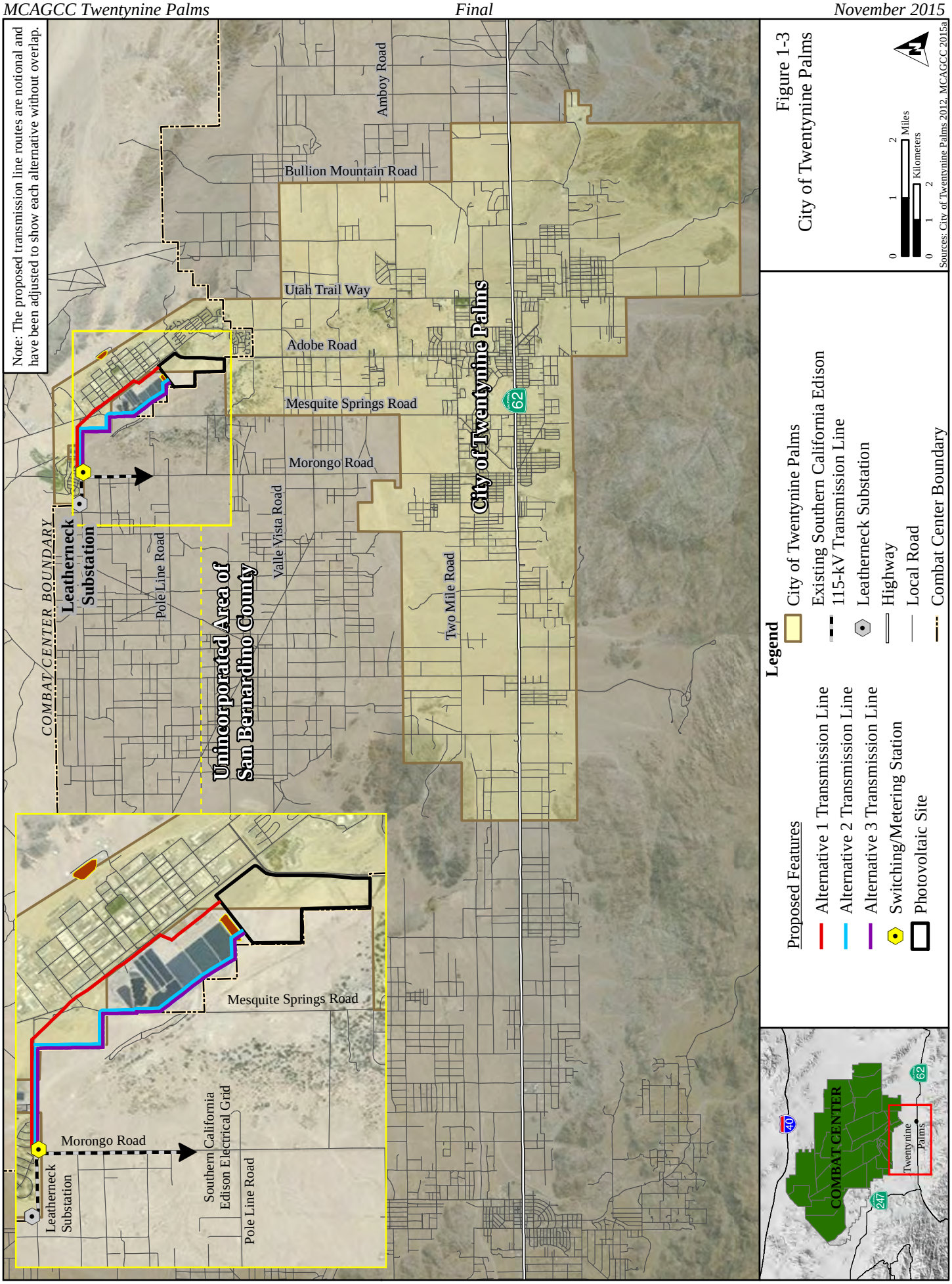


Figure 1-3
City of Twentynine Palms

Aesthetics – The Proposed Action is not associated with a scenic vista or visual resource. While the nearest potential receptors would normally be the most sensitive due to proximity, the adjacent land outside of the Combat Center is sparsely populated (with no more than four residences located within 0.6 mile [1.0 km] of the Proposed Action site) and the Proposed Action would be partially or fully screened to these residences by topography or vegetation. Due to the area's topography, people traveling north on Adobe Road at 2 Mile Road would have the greatest view of the proposed project, but at this distance (approximately 4 miles [6.5 km]), the project would blend in with the existing development shown in Figure 3-1. Therefore, no significant impacts to aesthetics would occur with implementation of the Proposed Action.

Recreation – The Proposed Action would be designed such that the adjacent on-installation running track would not be affected. As such, the Proposed Action would not affect recreational opportunities within or adjacent to the project area. Therefore, no significant impacts to recreation would occur with implementation of the Proposed Action.

Hazardous Materials and Wastes – The Proposed Action would not affect munitions response program sites because none are located within the project area. The Proposed Action would not affect any Installation Restoration sites, and the private partner would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for management and disposal of hazardous materials and wastes. Therefore, no significant impacts to hazardous materials and wastes would occur with implementation of the Proposed Action.

Transportation – The existing transportation network leading to the project site and within the Combat Center including Adobe Road and Del Valle Road, operates at adequate capacity (USMC 2012). Under the Proposed Action, there would be a minor and temporary increase in traffic associated with worker trips and the delivery of equipment and materials during construction and decommissioning activities. During the operational phase, there would be no impact to transportation, as the maintenance activities would only require a small number of vehicle trips per year. Therefore, no significant impacts to transportation would occur with implementation of the Proposed Action.

Noise – Construction and decommissioning noise generated by the Proposed Action would be temporary, limited to regular working hours, and negligible when compared to the current noise environment. Recurring operational/maintenance activities would generate negligible amounts of noise. Therefore, no significant impacts to noise would occur with implementation of the Proposed Action.

Socioeconomics and Environmental Justice – The Proposed Action would occur within the boundaries of a military installation, and the construction and operation activities associated with the Proposed Action would not result in a permanent change to population, ethnicities, or age distribution. As such, there would be no disproportionally high environmental or health impacts on low-income populations or minority populations from implementation of the Proposed Action. Therefore, no significant impacts to socioeconomics and environmental justice would occur with implementation of the Proposed Action.

Public Health and Safety/Protection of Children – The Proposed Action would be sited in accordance with established land use development guidelines addressing safety, functionality, and environmental protection zones. The project site is located in an industrial area of Mainside where access is controlled. The nearest sensitive receptor land uses (i.e., residences, schools, daycare centers, playgrounds or medical facilities) (Mohave Desert Air Quality Management District [MDAQMD] 2009) to the Proposed Action are a park named Felix Field, located 250 ft (76 m) east of the project boundary, and a residence, located 700 ft (213 m) northeast of the project boundary. No construction of additional housing is planned for any area immediately adjacent to the Proposed Action. Other sensitive receptors in the vicinity of the

Proposed Action are a child development center 1,400 ft (426 m) to the east, and an elementary school 3,500 ft (1,066 m) to the southeast. Construction areas would be fenced during construction to prevent access by unauthorized persons, including children, and permanent fencing would be in place during the life of the project through decommissioning.

Ground disturbance during construction could result in the release of dust, which may carry spores from *Coccidioides immitis*, the fungus that causes coccidioidomycosis known as Valley Fever (University of Arizona Valley Fever Center for Excellence 2010a, 2010b, 2015). The occurrence of Valley Fever in the southwestern U.S. has been known since the 1940s. While research since this time has improved knowledge related to Valley Fever, techniques to reliably test soil for the fungus that causes Valley Fever were developed only very recently and many questions remain unanswered. Regardless, the greatest threat to public health and safety from localized disturbances such as the proposed project is to construction personnel working in the vicinity of ground-disturbing activities, and it has been shown that the implementation of measures to avoid and minimize the generation of, and exposure to, dust can allow construction activities to proceed safely within areas known to contain the fungus that causes Valley Fever. Refer to Table 2-1 for a detailed list of all proposed avoidance and minimization measures that would be implemented as part of the Proposed Action, and refer to the *Public Health and Safety/Protection of Children* subsection at the beginning of Chapter 3 for additional discussion. Based on the analysis provided in Chapter 3, and with the implementation of the proposed avoidance and impact minimization measures and SCMs, no significant impacts to public health and safety or to the protection of children would occur with implementation of the Proposed Action.

1.6 INTERGOVERNMENTAL COORDINATION

1.6.1 Agency Consultations

Table 1-1 presents the anticipated agency permits and consultation potentially needed for the Proposed Action. As shown in the table, the Combat Center has consulted with the California State Historic Preservation Office (SHPO) under the National Historic Preservation Act (NHPA) as part of the NEPA process, and the private partner would be required to obtain approval from the California Public Utilities Commission (CPUC) and the California Independent System Operator (CAISO) after completion of the NEPA process. Per the Basewide Biological Opinion, with the implementation of the proposed Avoidance and Impact Minimization Measures/Special Conservation Measures (SCMs) listed in Table 2-1, consultation with the U.S. Fish and Wildlife Service (USFWS) is not necessary.

Table 1-1. Anticipated Permits and Consultation for the Proposed Action

Agency	Permit or Approval	Current Status
California SHPO	Section 106 of the NHPA	The USMC consulted with the SHPO and concurrence was provided (refer to Appendix E).
CPUC	Public Utilities Code Section 399.11	The private partner would obtain a power purchase agreement from the CPUC after completion of the NEPA process.
CAISO	Public Utilities Code Sections 2811-2816	The private partner would obtain an Interconnection Agreement from the CAISO after completion of the NEPA process.

1.6.2 Summary of Relevant Renewable Energy Policies

The following provides a summary of federal requirements relevant to the Proposed Action.

1.6.2.1 Executive Order 13693, Planning for Federal Sustainability in the Next Decade

Executive Order (EO) 13693 (dated 19 March 2015) superseded EO 13423 (*Strengthening Federal Environment, Energy, and Transportation Management*) and EO 13514 (*Energy Efficient Standby Power Devices*). The goal of EO 13693 is to maintain federal leadership in sustainability and greenhouse gas emission reductions. EO 13693 establishes policies to maintain federal leadership in sustainability and greenhouse gas emission reductions. As relevant to this EA, EO 13693 identifies requirements relating to energy conservation, efficiency, and management; minimum percentages of total building energy obtained from clean energy sources; and, improvements in water use efficiency and management, including stormwater management.

1.6.2.2 Secretary of the Navy Energy Goals

On 14 October 2009, the SECNAV established five aggressive renewable energy goals for the DoN's shore-based installations to meet by 2020. The goals pertain to improve fuel use in aircrafts as well as energy reduction and production. The goal that pertains the most to this document is: The DoN will produce at least 50% of shore-based energy requirements from alternative sources (refer to Section 1.1.1, *Secretary of the Navy Renewable Energy Goals and Strategies*).

1.6.2.3 1 Gigawatt Initiative

In support of the SECNAV Energy Goals, 1 October 2012, Secretary Maybus chartered the 1 GW Task Force to enable the DoN to procure 1 GW of renewable energy generation capacity by 2020. 1 GW of renewable energy generation directly addresses several of the mandates and goals for which the DoN is accountable: EO 13693 (this EO superseded EOs 13423 and 13514), the 10 USC § 2911 "25 by 25" mandate (25% by 2025), Energy Policy Act 2005 graduated renewable energy targets, the SECNAV's departmental goals.

To reach the 50% renewable energy generation goal (which the 1 GW goal directly supports) in a cost-effective fashion, the DoN must purchase or facilitate the production of significant quantities of renewable energy while reducing power consumed through energy efficiencies. The overall DoN energy strategy therefore includes both lines of effort: deploy renewable energy in support of the 1 GW goal and simultaneously bring the 50% renewable energy generation goal closer by reducing overall energy consumption.

1.7 PUBLIC AND AGENCY PARTICIPATION

As described in Appendix A, Public Involvement Process, as part of this EA effort, the USMC initiated the public participation process with publication of a Notice of Availability (NOA) of the Draft EA in two local newspapers; The Desert Trail on 9 July 2015 and 16 July 2015 and the Hi Desert Star on 9 July 2015 and 16 July 2015. The Draft EA was made available at the Twentynine Palms Branch and the Yucca Valley Branch Libraries and online, on the Combat Center website (available at http://www.29palms.marines.mil/Staff/G4InstallationsandLogistics/NREA.aspx). The 30-day public comment period for the Draft EA commenced on 9 July 2015 and concluded on 8 August 2015. No comments were received.

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CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

This chapter discusses the reasonable alternative screening factors (Section 2.1); the Proposed Action and action alternatives (Section 2.2); the No Action Alternative (Section 2.3); and the alternatives considered but eliminated from detailed analysis (Section 2.4). Section 2.5 provides a summary of the environmental consequences.

2.1 REASONABLE ALTERNATIVE SCREENING FACTORS

Alternatives to the Proposed Action must be considered in accordance with NEPA, CEQ Regulations for Implementing the Procedural Provisions of the NEPA, and MCO P5090.2A. CEQ regulations, for example, establish a number of policies for federal agencies, including "using the NEPA process to identify and assess the reasonable alternatives to the Proposed Action that will avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2 [e]). However, only those alternatives determined to be reasonable relative to their ability to fulfill the purpose of and need for the Proposed Action, as defined in Section 1.3, require detailed analysis. Action alternatives were developed based upon whether a proposed alternative met the purpose of and need for the project, and the below-listed reasonable alternative screening factors.

1. Must not interfere with the Combat Center's mission activities and operations or create unsafe conditions.
2. Should contribute to the SECNAV's goal of obtaining one GW of renewable energy generation capacity by the end of 2020 by providing a sufficiently sized parcel of land for solar PV system placement.
3. Should provide a location and/or design capable of providing electricity at or below the current cost of traditional power (e.g., orientation/location/slope relative to the sun for generating higher amounts of power, or a lower system cost relative to output).

2.2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.2.1 Proposed Action/Alternative 1

The Proposed Action/Alternative 1 involves the construction, operation, maintenance, and eventual decommissioning of a 241-ac (97-ha) solar PV system at Mainside, west of Adobe Road (Figure 2-1) and a transmission line to transmit the energy to the civilian grid. The PV site consists of vacant land that was previously disturbed for use as an airfield. The area is also referred to as Mesquite Dry Lake, a desert playa that infrequently ponds with water after storm events. Depending on the type of PV panel selected by the operator/lessee, the proposed project could produce between 25 MW and 57 MW of power, which would produce between 65,700 MW-hours and 150,000 MW-hours of energy per year based on an annual average of 7.2 hours of full sunlight per day (DoN 2012). Based on average annual household electricity consumption in 2012, this would provide enough electricity for 6,000 to 13,800 homes (U.S. Energy and Information Administration 2014). All components of the proposed solar PV site would be located at least 33 ft (10 m) from the Combat Center's perimeter fence to meet Anti-terrorism Force Protection requirements.

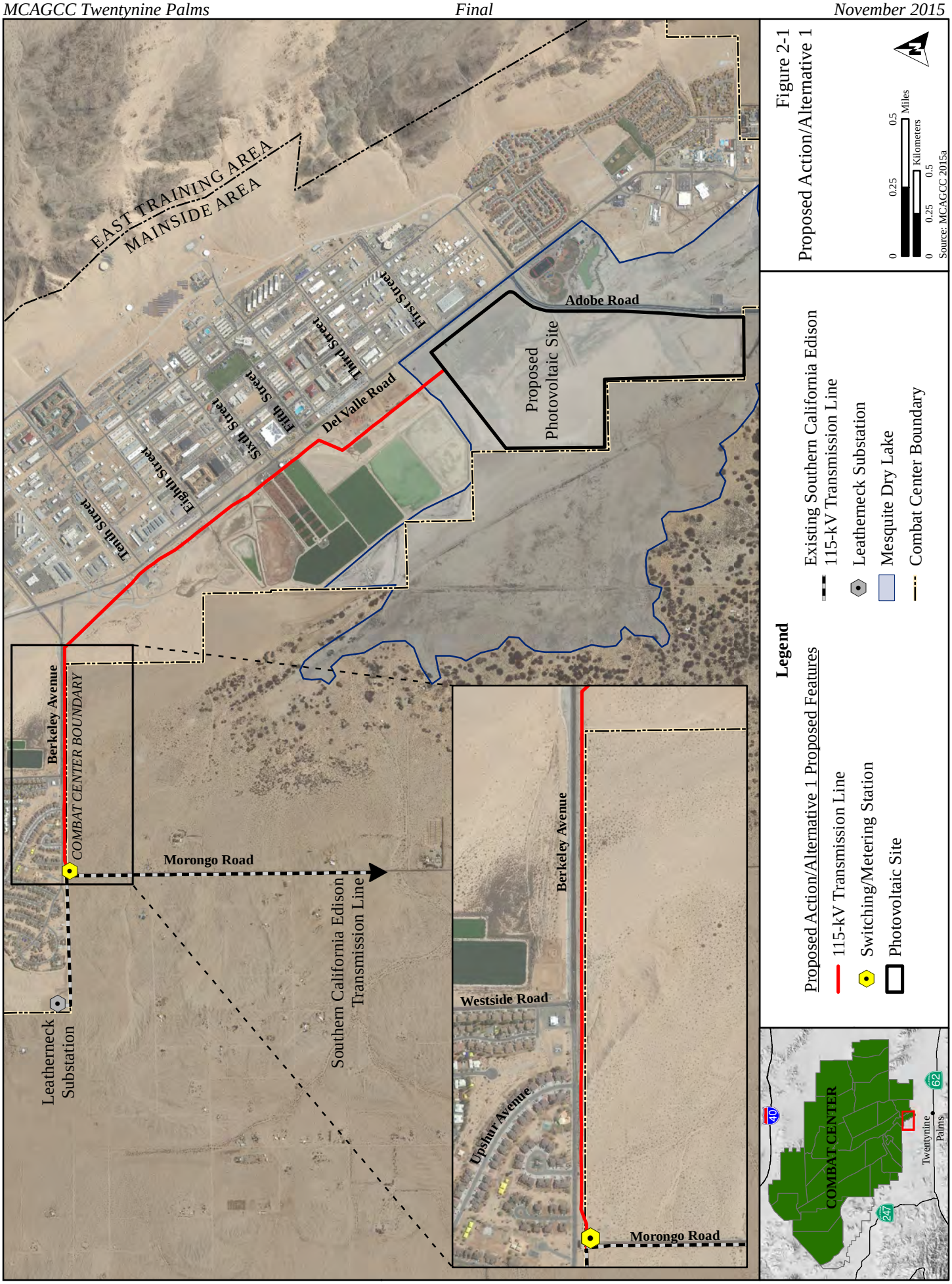

Figure 2-1
Proposed Action/Alternative 1

The solar PV site would consist of solar PV panels, steel tracking structure, inverters, combiner boxes, electrical switchgear, a substation, and associated electrical wiring, connections, and other items required for the solar PV system. All electrical equipment, including inverters and transformers would be constructed on concrete pads and solar PV wiring would be underground and/or pole mounted.

Understanding Power (MW) and Energy (MW-hour)

Power is analogous to speed: both measure the rate at which something is occurring, and both can be expressed in several ways. For example, speed can be expressed in miles per hour, feet per second, inches per minute, etc. Power can be expressed in joules (a unit of energy) per second. One joule per second is known as a watt, and a million joules per second is known as a MW.

Energy is analogous to distance: both measure a set amount or quantity, and both can also be expressed in several ways. For example, distance can be expressed in miles, kilometers, feet, etc. Energy can be expressed in joules (a unit of energy), but often is expressed in MW-hours (a much bigger unit of energy): using one million joules per second (one MW of power) non-stop for an hour would use 3.6 billion joules, or one MW-hour, of energy.

For more information, please refer to BizEE Energy Lens (2014) online at: http://www.energylens.com/articles/kw-and-kwh.

Metering and switching functions would be accommodated either at a proposed switching station southeast of Ocotillo Gate or through an air-switch in the same location combined with metering at the PV site. A pilot wire or fiber optic cable would accomplish the switching/metering. If a switching station is required by the local utility, it would be the responsibility of the private partner to acquire a lease for the land outside of the Combat Center boundary. No battery backup would be provided and the proposed solar PV site would only generate power during the daylight hours.

Under Model 2, the proposed PV facility would feed the Leatherneck Substation owned by Southern California Edison (SCE) and would not be directly connected to the MCAGCC electrical distribution system. For the proposed project to contribute to the Combat Center's existing co-generation/micro-grid system, the electricity directed to the Leatherneck Substation would need to be redirected to the Combat Center's electrical distribution system, which may require additional communications, controls, relays, breakers and switches. For purposes of this analysis, this additional infrastructure is assumed to be included within the proposed project area.

Gravel roads would be graded between the rows of solar PV panels and around the site perimeter for maintenance access. No other access improvements would be required as part of the Proposed Action/Alternative 1 because the existing road network adjacent to the project area is sufficient. A chain link fence with barbed-wire outriggers in accordance with force protection standards would enclose the solar PV site to minimize the potential for unauthorized individuals to enter the area.

2.2.1.1 Agreement

The proposed solar PV system would be developed by a private partner who would construct, own, operate, maintain and eventually decommission the system through an agreement with the DoN. The private partner, or lessee, would provide the PV power to end-users via the SCE "civilian" grid. At the time of preparation of this document, there has been no determination regarding the private partner/lessee or the end-user who would purchase the PV power generated by the lessee.

The 37-year agreement would consist of 2 years for construction, followed by an initial 25-year operating term and two, 5-year operating extensions (10 years). This acquisition strategy maximizes the total capacity (size) of the system based on available land.

In keeping with authority of 10 USC § 2667, outgrants (leases) under Model 2 shall provide for consideration (rent) to be paid, either in cash or in-kind, in an amount not less than the fair market value of the lease. Potential projects provided by lessee to apply towards rents as in-kind consideration will meet necessary environmental regulations and requirements under separate reporting. The primary financial benefit to the Combat Center is expected to be in the form of in-kind services that could include the construction of facilities, utility services, or real property maintenance services. The type of arrangement is considered a good option for installations that can accommodate a large PV project but cannot consume the energy the project would produce (DoN 2012).

Tangible, valuated, in-kind consideration that enhances DoN energy security posture is the primary preference of consideration negotiation. In-kind benefits that do not enhance energy security and cash consideration are allowed, but are less favorable to DoN. DoN and lessee shall coordinate during the course of due diligence and preliminary feasibility analysis to define and agree on tangible, valuated, energy security benefits on a project by project basis.

All land transfer agreements for renewable energy will include the legal access to electricity generated by assets built on DoN land.

2.2.1.2 Construction of the Solar PV System

The solar PV system being considered in this EA could be constructed on flat or sloped grades. Soil disturbance would include multiple augured holes for pole mounting and/or concrete footings. The solar PV panels would be mounted on poles at a height sufficient to prevent damage during a 100-year flood event at the Mesquite Dry Lake. In addition, soil could be built up, compacted, and stabilized (potentially with rock rip-rap) in a relatively small area to ensure the PV system's substation, inverters, and associated transformers remain at least 2 ft (0.6 m) above the flood zone. Soil used for this purpose would be collected from the project area, and soil and topography would be managed in a manner that would ensure there is no net reduction in the project site's ability to retain stormwater. The private partner or construction contractor would also be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) that would adhere to Combat Center requirements for storm water pollution prevention and control.

The project site would be watered as needed for dust control during construction activities. Based on a nearby 35-ac (14-ha) PV project that requested 26 acre-feet (ac-ft) (8.5 million gallons), it is expected that the proposed project could require as much as 179 ac-ft (58.3 million gallons) of water for dust control. The private partner would be responsible for obtaining the necessary water; it is expected that this water would come from one or more of the three nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District). The private partner would also be responsible for shipping the water to the project site via truck. To reduce impacts to groundwater, reclaimed water would be used as much as possible. It is also expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads and reduce the need to use water to control dust.

The private partner would ensure that all lighting used temporarily during construction or permanently as part of the proposed project would comply with the City of Twentynine Palms lighting and night sky ordinances. Generally, this requires all outdoor lighting fixtures to be fully shielded or constructed so that light rays emitted by the fixtures are not directed upward or onto an adjacent property.

Project construction would take approximately 2 years to complete and would require up to 150 personnel to be on-site at any time during construction if a 50-MW facility is constructed.

2.2.1.3 Operations and Maintenance

Maintenance of the proposed solar PV system is expected to involve periodic washing of the panels to eliminate dirt and dust as needed. If not maintained, dirt and dust can accumulate on the PV panel's surfaces, thereby blocking some of the sunlight and reducing insolation efficiency (i.e., output). Washing would occur when the ambient temperature is low to prevent thermal expansion, which could damage or compromise the structure of the PV panels, and would be conducted from water trucks filled with deionized water obtained from an off-installation source. It is expected that this water would come from one or more of the three nearby water districts mentioned above. Based on estimates that the Cascade Solar Plant near Joshua Tree, CA would require 2 ac-ft (652,000 gallons) of water for an 18.5 MW project (Joshua Tree Water District 2011), the proposed 50 MW PV solar system at the Combat Center is expected to annually require approximately 5.4 ac-ft (1.8 million gallons) of water for washing, dust control, and personnel use. To reduce impacts to groundwater, reclaimed water would be used as much as possible. To reduce water requirements for dust control on unpaved roads, it is expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads. Any vegetation underneath the panels would be compatible with the solar PV system and can reduce dust and minimize erosion. Vegetation under the panels is expected to be similar to existing conditions (i.e., minimal).

2.2.1.4 Decommissioning

A decommissioning plan would be prepared in accordance with DoN requirements. The plan would ensure that the project facilities would be decommissioned and removed and that the site would be restored to pre-construction conditions. Soils and impacted areas would be reclaimed to a level that would, at a minimum, support uses for the land consistent with pre-construction activities. The decommissioning and restoration process would likely involve the removal of above ground structures, possible grading, and restoration of topsoil. A revegetation and seeding plan approved by the Combat Center's Natural Resources and Environmental Affairs (NREA) office would be implemented following decommissioning activities to restore the site to pre-project conditions for specific areas within, or adjacent to, the Mesquite Dry Lake or along the transmission line corridor. Temporary erosion and sedimentation control best management practices would be used during the decommissioning phase of the project.

Pre-existing Combat Center power poles that were replaced with taller wooden poles to carry the PV energy, would be topped off (i.e., cutting off the power pole just above the existing cross arms and wires) and left in place. In so doing, the pole would be returned to the height it was at before the higher PV wires were installed. Steel poles would be removed by the private partner at the discretion of the Combat Center.

Anticipated decommissioning activities would be completed using a mix of equipment and vehicles, likely to include bulldozers, scrapers, backhoes, water trucks, and truck-mounted mobile cranes, and are estimated to occur over a period of approximately 2 months. Water, environmentally-friendly and biodegradable polymeric stabilizers, and/or rock rip-rap would continue to be used to control dust during decommissioning activities. It is expected that as much as 15 ac-ft (4.9 million gallons) of water could be used during decommissioning from the same off-installation sources as identified for construction. To reduce impacts to groundwater, reclaimed water would be used as much as possible.

All hazardous materials would be disposed of in accordance with applicable regulations at an appropriately accredited facility for the hazardous material(s). A decommissioning staging area would be delineated within the overall project area and all work would be done on-site. Following

decommissioning activities, the DoN would certify that the land condition has been returned to its pre-project condition. All decommissioning activities would be conducted in compliance with all regulations applicable to conducting work activities at the Combat Center, and adherence to the environmental protection measures presented in Section 2.5, *Summary of Environmental Consequences*.

2.2.1.5 Transmission Line

A new transmission line would be installed to transmit the PV energy to the civilian grid. The new transmission line would share the existing 34.5-kilovolt (kV) transmission line alignment that generally parallels Del Valle Drive from the PV site to the northwest. This existing utility alignment turns west toward the Leatherneck Substation along the south side of Berkeley Avenue. At Berkeley Avenue, the transmission line would turn west and connect to a potential switching and metering facility, located to the east of the Leatherneck Substation near Ocotillo Gate outside of the Combat Center. Implementation of the Proposed Action/Alternative 1 would require replacing every other existing, wooden power pole with a taller pole. At each dead-end, and at each change in direction, an 80-ft (24-m) tall steel pole with a concrete base would be installed. To avoid interrupting Combat Center operations, work along the entire transmission line would be completed while the existing transmission lines are operational, or "hot." Once the work is completed, the existing lines would remain as they are (but would be attached to the new poles) and a new 115-kV transmission line would be located above the existing lines near the top of the new poles. The new line would allow power to be transmitted from the proposed solar PV site to the switching and metering facility, and then to the SCE electrical grid. The transmission line portion of the Proposed Action/Alternative 1 is 2.6 miles (4.2 km) long.

2.2.2 Alternative 2

Alternative 2 consists of all of the actions proposed under Proposed Action/Alternative 1, with the only difference being the location for the new transmission line (Figure 2-2). The new transmission line would follow the Combat Center's boundary to the west and northwest of the proposed solar PV site. At Berkeley Avenue, the new line would turn west. The portion of Alternative 2 along Berkeley Avenue would be identical to the Proposed Action/Alternative 1 (i.e., sharing the alignment with the existing 34.5-kV transmission line and replacing every other power pole). Construction work would be done while the existing transmission lines are operational. Under Alternative 2, power would be transmitted from the proposed solar PV site to the switching and metering facility and then to the SCE electrical grid, similar to the Proposed Action/Alternative 1. The transmission line portion of Alternative 2 is 2.9 miles (4.7 km) long.

2.2.3 Alternative 3

Alternative 3 consists of all of the actions proposed under Proposed Action/Alternative 1, the only difference being the location for the new transmission line (Figure 2-3). The new transmission line would follow the same route as Alternative 2 except for the portion of the line along Berkeley Avenue. Along Berkeley Avenue, instead of sharing the alignment with the existing 34.5-kV transmission line (as in the Proposed Action and Alternative 2), at Berkeley Avenue the new transmission line would exit the Combat Center and be located outside of the Combat Center. The new line would allow power to be transmitted from the proposed solar PV site to the switching and metering facility, independent from the existing Combat Center infrastructure, and then to the SCE electrical grid. The transmission line portion of Alternative 3 is 2.9 miles (4.7 km) long, 0.24 mile (0.38 km) of which would be located outside of the Combat Center's boundary. This alternative would require the private partner to acquire an easement for the off-Combat Center portion of the transmission line. Separate environmental review would be required for development outside of the Combat Center.

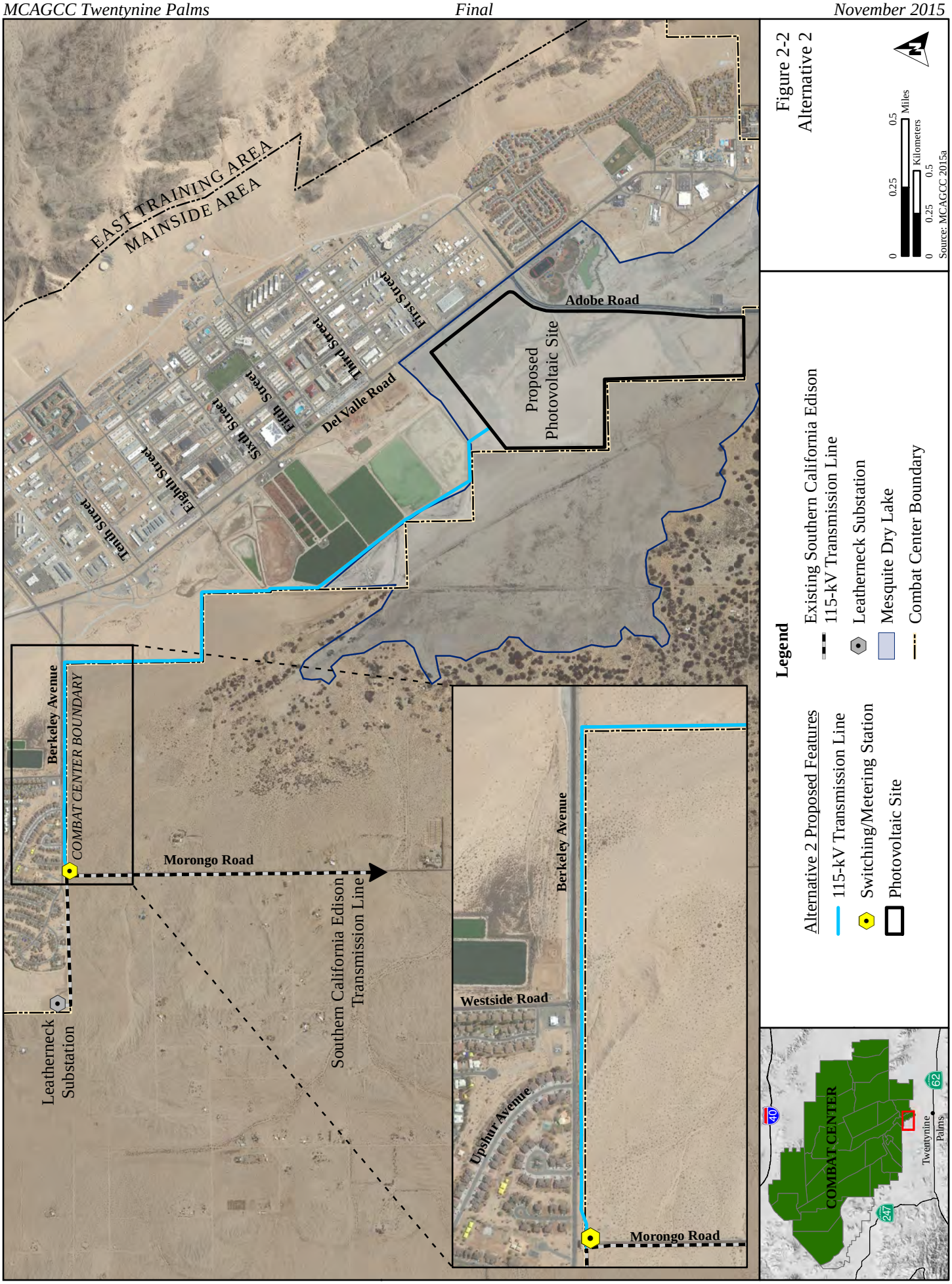

Figure 2-2
Alternative 2

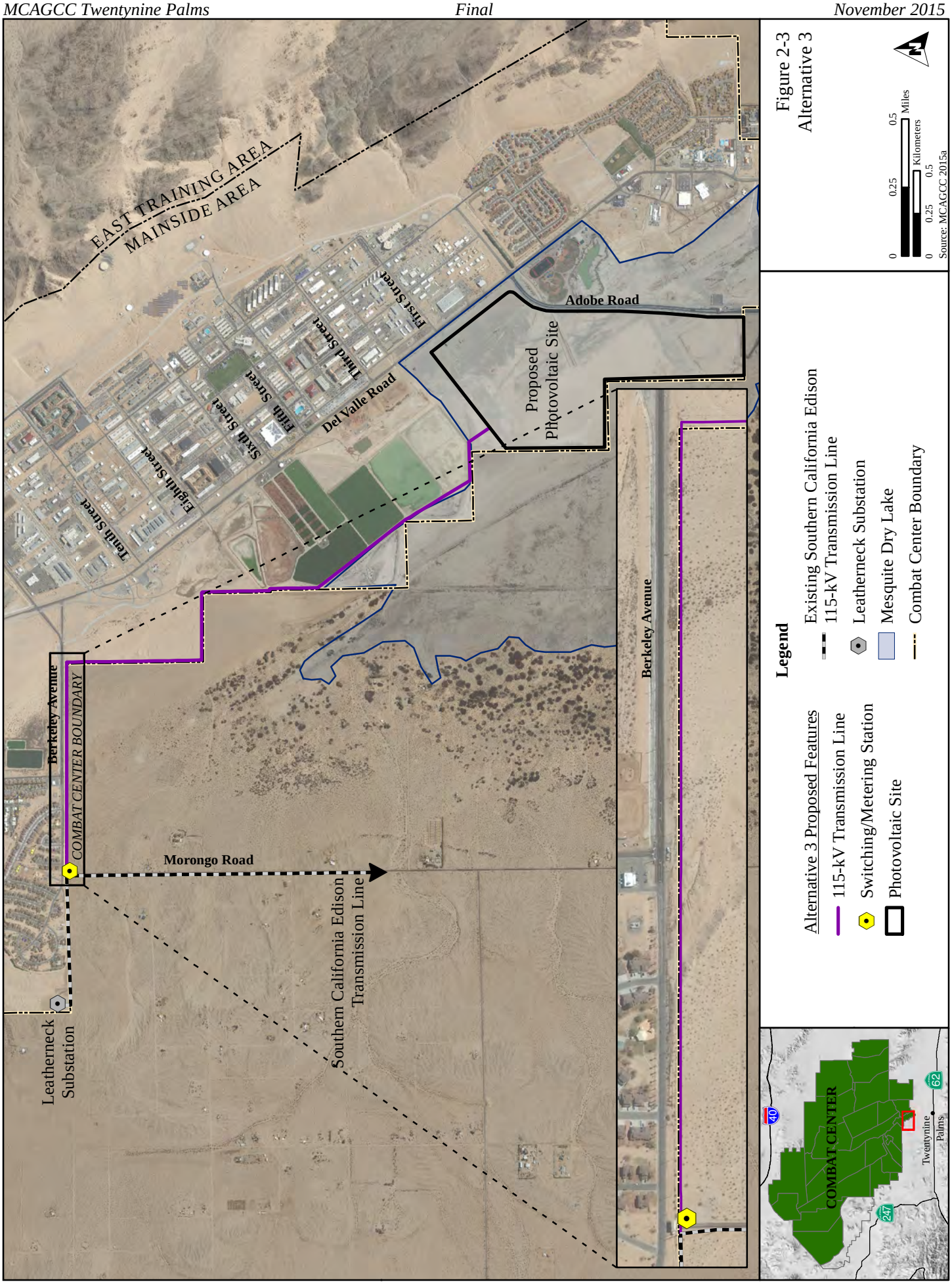

Figure 2-3
Alternative 3

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center. The No Action Alternative represents the status quo. The No Action Alternative does not meet the purpose and need with regard to meeting DoN renewable energy goals; however, the DoN has analyzed it in this EA to provide a baseline against which to measure environmental consequences of the action alternatives. The affected environment section of Chapter 3 describes the No Action Alternative (existing conditions) for each resource area. The analysis of the No Action Alternative in Chapter 3 assumes energy generation at the Combat Center would remain status quo (no new solar PV construction, operations/maintenance, or decommissioning would occur) and the PV site would continue to be vacant.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

During the planning process, the Combat Center identified and then eliminated the following potential action alternatives because they did not meet the purpose of and need for the project, the reasonable alternative screening factors, or were not feasible otherwise.

2.4.1 Other Locations at the Combat Center

The 2012 study identified four areas that could potentially support large-scale PV development: the proposed project area, an area southeast of the proposed project area on the opposite side of Adobe Road, and two areas at the northwest end of Mainside along Del Valle Road (DoD ESTCP 2012). These areas were further reviewed during the 2014 Feasibility Study (DoN and USMC 2015). Except for the proposed project area, all areas identified would (1) impact existing or planned land uses, and therefore the Combat Center's mission, as identified in the Combat Center's 2009 Master Plan (MCAGCC 2009); or (2) have increased impacts to biological resources due to the occurrence of creosote bush scrub throughout the site. As such, the other areas identified by the 2012 study would not meet the purpose and need for the proposed project.

2.4.2 Concentrated Solar Power Technology

Concentrating solar power systems use mirrors to reflect and concentrate sunlight into receivers. These receivers then convert the sunlight into thermal energy that is used to produce electricity through a steam turbine. Consequently, these energy systems require large quantities of water. Parabolic troughs and "solar power towers" are the most common forms of concentrated solar power technology. Concentrated solar power technologies do not meet the purpose of the proposed project to build a PV system and also have increased environmental impacts due to increased water use and more stringent grading requirements. As such, concentrated solar power technology would not meet the purpose and need for the proposed project.

2.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-1 provides a summary of environmental consequences by resource area and Avoidance and Impact Minimization Measures/SCMs for each alternative. The Minimization, Mitigation, and Monitoring Implementation Plan and Minimization, Mitigation, and Monitoring Effectiveness Report (Appendix B) provides this information in a tabular format for tracking purposes. As described in Section 1.5.3, *Resources Not Analyzed in Detail*, several resources were not carried forward for detailed analysis because the project would not affect, or would only negligibly affect, these resources.

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Biological Resources	Approximately 241 acres (ac) (97 hectares [ha]) of sparsely vegetated land on the eastern portion of Mesquite Dry Lake mapped as urban and playa habitat would be directly impacted. Wildlife and special status species, namely the desert tortoise and Mojave fringe-toed lizard, would potentially be exposed to direct and indirect impacts. However, with implementation of Avoidance and Impact Minimization Measures and Special Conservation Measures (SCMs) listed below, the Proposed Action/Alternative 1 is not likely to incidentally take or otherwise adversely affect desert tortoises, and effects to Mojave fringe-toed lizards and other wildlife species and their populations would be less than significant. Per the Basewide Biological Opinion, with the implementation of the proposed Impact Minimization Measures and SCMs, consultation with the United States (U.S.) Fish and Wildlife Service (USFWS) is not necessary. Monitoring of the solar photovoltaic (PV) site would be conducted to assess any potential negative effects to migratory birds and other species. Therefore, implementation of the Proposed Action/Alternative 1 would have less than significant impacts to biological resources.	Impacts to biological resources under Alternative 2 would be nearly identical to those under the Proposed Action/Alternative 1. Alternative 2 would be implemented in accordance with the same Avoidance and Impact Minimization Measures and SCMs as the Proposed Action/Alternative 1. Therefore, implementation of Alternative 2 would have less than significant impacts to biological resources.	Impacts to biological resources under Alternative 3 would be nearly identical to those under the Proposed Action/Alternative 1. Alternative 3 would be implemented in accordance with the same Avoidance and Impact Minimization Measures and SCMs as the Proposed Action/Alternative 1. Therefore, implementation of Alternative 3 would have less than significant impacts to biological resources.	Under the No Action Alternative, the Department of the Navy (DoN) would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center. Therefore, implementation of the No Action Alternative would have no impact to biological resources.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **BR-1.** If construction or decommissioning activities occur during the recognized avian breeding season (1 February through 30 September), construction would occur in accordance with the Migratory Bird Treaty Act (MBTA) to avoid impacts to nesting migratory birds. Specifically, a biologist approved by the Combat Center's Natural Resources and Environmental Affairs (NREA) office would survey the proposed project area for nesting birds prior to activities. If the biologist finds an active nest, construction workers would not directly or indirectly disturb the			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	nest or adjacent areas until the biologist determines the nest is no longer in use. • **BR-2.** The private partner would construct all transmission towers, poles, and lines in accordance with the guidelines in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006), or the most current version of the guidelines available at the time of construction, and in *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012). • **BR-3.** An NREA-approved Authorized Biologist (AB) would be present during the initial groundbreaking during the construction and decommissioning phases and would conduct a clearance survey to ensure no tortoises are in the area. A tortoise exclusion fence would be constructed around the PV site and would remain in place for the duration of the construction and decommissioning phases. Temporary exclusion fencing would be built around the construction/decommissioning area for each steel tower that would support the new transmission lines. The NREA-approved AB would inspect the fence line of the tortoise exclusion fencing at least once every two weeks and within 24 hours of any rain event. • **BR-4.** Per the Basewide Biological Opinion, if a tortoise is found in the action area during ground breaking activities, all ground breaking activities must halt until NREA is contacted and NREA processes the tortoise and authorizes ground-breaking activities to resume. Following construction/decommissioning, the temporary tortoise fencing would be removed. • **BR-5.** An NREA-approved AB would be "on-call" during construction in case a desert tortoise is encountered. The DoN and private partner would provide NREA the names and qualifications of AB candidates, with ultimate approval coming from the USFWS and NREA. • **BR-6.** The private partner would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fence is installed. The FCR would be responsible for overseeing compliance with biological resources conservation measures. The FCR would be on-site during all project activities. The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation of these measures. An NREA representative would make bi-weekly visits to ensure compliance. • **BR-7.** Before the start of construction activities, all personnel within the project work areas, including all participating agency employees, construction and maintenance personnel, and others who implement authorized actions, would receive worker training that includes the NREA-provided Environmental Awareness Training about desert tortoises, cultural resources, hazardous materials and hazardous wastes. • **BR-8.** All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project area to reduce the attractiveness of the area to common ravens (*Corvus corax*) and other predators. Any trash receptacles used for waste storage would be equipped with latching/locking lids. The FCR would be responsible for ensuring that trash is removed regularly from the project area, and that the trash containers are kept securely closed when not in use. • **BR-9.** Vehicle speed limits within the project area and along access roads would not exceed 20 miles (32 kilometers [km]) per hour. Speed limits would be clearly marked by the private partner, and workers would be			measures/SCMs are proposed.

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	made aware of these speed limits. Vehicles parked outside of exclusion fencing would be inspected underneath for desert tortoises immediately before the vehicle is moved. If a desert tortoise is found under a vehicle, the vehicle would not be moved, NREA would be contacted immediately, and the tortoise would be monitored for its safety until NREA processes the tortoise. • **BR-10.** Should a dead or injured tortoise be located on-site at any time, the NREA would be notified immediately. In the case of an injury to a tortoise, NREA will contact USFWS immediately to decide the appropriate course of action. In the case of a dead tortoise, NREA will telephone and notify the USFWS within three days of the finding, and written notification within 15 days of the finding. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information. • **BR-11.** The permanent security fence around the solar PV site would be contiguous to the permanent desert tortoise exclusion fence to prevent tortoises from burrowing under the fence. • **BR-12.** Monthly monitoring surveys would be conducted at the PV site by an NREA-approved biologist to assess use of the area by wildlife, vegetation changes, and potential bird/bat mortalities and/or injuries. In addition, project personnel working onsite would also record wildlife use of the project area. Results of the surveys and the data collected by project personnel would be provided to the NREA in quarterly reports for comments and recommendations to minimize impacts from continuing operations. • **BR-13.** If federally-listed species (e.g., desert tortoises) are observed in the project area during construction/decommissioning activities and/or during operation of the solar PV system, NREA will be notified immediately for further instructions, which may ultimately require USFWS instructions. The NREA would also be notified immediately if a dead or injured bird protected by the MBTA is found on-site at any time, or if any incidents occur that may affect the health and safety of project personnel (e.g., locating a rattlesnake within the project area). • **BR-14.** A revegetation and seeding plan approved by the NREA would be implemented following decommissioning activities to restore the site to pre-project conditions. • **BR-15.** An NREA-approved biological monitor would survey the solar PV site for mammals, reptiles, and/or nesting birds prior to decommissioning activities. If nesting or denning animals are found to occur in the solar PV sites, they would be allowed to leave the sites on their own accord or would be passively relocated during the avian non-breeding season (October – January) prior to the start of decommissioning activities. If federally-listed species are found to occur in the solar PV site prior to the start of decommissioning activities, then activities will halt, NREA will be contacted, and the private partner would plan further action to avoid take of the listed species. • **BR-16.** The private partner would prepare and submit a Weed Management Plan to the NREA for review and approval. Once approved, the private partner would be responsible for implementing the Weed Management Plan.			

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Geological Resources	The Proposed Action/Alternative 1 is located in relatively flat areas that are not susceptible to landslides. The geology and topographic features of the project area would not be substantially altered and the project would not result in the loss of availability of a known mineral resource or fossils. With implementation of Avoidance and Impact Minimization Measures and SCMs listed below, erosion would be minimized during construction through adherence to the Combat Center's Stormwater Pollution Prevention Plan (SWPPP) and facilities would be designed to accommodate poor drainage and high shrink-swell soils in Mesquite Dry Lake and potential geologic hazards. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to geological resources.	Impacts under Alternative 2 would be similar to those described under the Proposed Action/Alternative 1, with the exception of impacts associated with the portion of the proposed Alternative 2 transmission line alignment that would be located along Mesquite Dry Lake. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to geological resources.	Impacts under Alternative 3 would be similar to those described under Alternative 2, except that the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to geological resources.	Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center and construction activities would not occur. Baseline geological conditions would remain unchanged. No impacts to geological resources would occur as a result of implementation of the No Action Alternative.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **GR-1.** The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities. • **GR-2.** A geotechnical study would be performed by professional civil or geotechnical engineers or engineering geologists licensed in the State of California and would provide design and construction recommendations, as appropriate, to reduce potential impacts associated with soil conditions and geologic hazards. The project would incorporate the recommendations identified by the geotechnical study and the proposed facilities associated with the project would be designed to accommodate for soil conditions and geologic hazards. *Note: specific dust control measures are included in the Air Quality summary.*			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Water Resources	There are no waters of the U.S. under the jurisdiction of the U.S. Army Corps of Engineers (USACE) located within the Proposed Action/Alternative 1 project area. Construction of transmission lines would not permanently alter or affect existing drainage patterns. Construction within the 100-year flood zone associated with Mesquite Dry Lake would be in compliance with Executive Order (EO) 11988, as amended. With implementation of Avoidance and Impact Minimization Measures and SCMs listed below, erosion would be minimized during construction through adherence to the Combat Center's SWPPP and impacts to the Mesquite Dry Lake 100-year flood zone would be minimized. Transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater. The private partner would be responsible for identifying and contracting with one or more local water districts to purchase the water required for Alternative 1. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to water resources.	Impacts under Alternative 2 would be similar to those described under the Proposed Action/Alternative 1. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to water resources.	Impacts under Alternative 3 would be similar to those described under the Proposed Action/Alternative 1. In addition, the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to water resources.	Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center and construction activities would not occur. Baseline conditions of water resources, as described in Section 3.3.3, would remain unchanged. No impacts to water resources would occur as a result of implementation of the No Action Alternative.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **WR-1.** The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities. • **WR-2.** To minimize impacts within a 100-year flood zone, all excess soils and construction debris would be			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	removed from the flood zone following construction. In addition, project facilities would be decommissioned and removed and the 100-year flood zone would be restored to pre-construction conditions at the end of the agreement term. • **WR-3.** To reduce impacts to groundwater, reclaimed water would be used as much as possible for dust control. • **WR-4.** To reduce water requirements for dust control, it is expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads. • **WR-5.** Transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater.			measures/SCMs are proposed.
Cultural Resources	No National Register of Historic Places (NRHP)-eligible archaeological, architectural, or traditional cultural resources have been identified in the area of potential effect. As such, no cultural resources occur within the area of potential effect. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the California State Historic Preservation Office (SHPO) (refer to Appendix E), implementation of the Proposed Action/Alternative 1 would not affect cultural resources and impacts would be less than significant.	Impacts to cultural resources under Alternative 2 would be similar to those described above for the Proposed Action/ Alternative 1. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the SHPO (refer to Appendix E), implementation of the Alternative 2 would not affect cultural resources and impacts would be less than significant.	Impacts to cultural resources under Alternative 3 would be similar to those described above for the Proposed Action/ Alternative 1. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the SHPO (refer to Appendix E), implementation of the Alternative 3 would not affect cultural resources and impacts would be less than significant.	Under the No Action Alternative, the proposed PV, transmission line, and associated infrastructure would not be constructed, and existing conditions would remain unchanged. Therefore, there would be no impacts to cultural resources with implementation of the No Action Alternative.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **CR-1.** The private partner would be responsible for preparing and implementing a Monitoring and Discovery Plan prior to construction, and archaeological monitoring would be required during all ground disturbing activities. A monitoring summary report would be completed at the end of the monitoring. • **CR-2.** If cultural resources are found during ground-disturbing activities associated with this project, work would stop and the NREA Cultural Resources Manager would be contacted immediately.			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Air Quality	Estimated emissions associated with the Proposed Action/ Alternative 1 would be below the *de minimis* levels for Clean Air Act (CAA) Conformity. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to air quality.	Estimated emissions associated with Alternative 2 would be below the *de minimis* levels for CAA Conformity. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to air quality.	Estimated emissions associated with Alternative 3 would be below the *de minimis* levels for CAA Conformity. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to air quality.	Under the No Action Alternative, no construction activities would occur, and the existing air quality environment would not be affected. Therefore, there would be no impacts to air quality.
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: General Measures • **AQ-1.** Proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within design standards. • **AQ-2.** Construction vehicle engines (non-road diesel engines) would conform to U.S. Environmental Protection Agency Tier 4 emission standards, when applicable. Dust Control Measures • **AQ-3.** In conjunction with measure AQ-16, the private partner would prepare a Dust Abatement Plan/Health and Safety Plan related to airborne dust that would be reviewed by the Combat Center and approved by the San Bernardino County Department of Public Health and the Mojave Desert Air Quality Management District (MDAQMD) prior to commencing any construction activities. This plan would cover all project phases (construction, operations, and decommissioning) as well as abandonment post-decommissioning and would include, but not be limited to, the avoidance and minimization measures listed below. The Dust Abatement Plan/Health and Safety Plan would also be reviewed and updated as needed to prevent dust from leaving the site. • **AQ-4.** The project would minimize the amount of ground disturbance to the greatest extent possible (e.g., by designing the project to minimize both grading and trenching). • **AQ-5.** Water trucks or sprinkler systems would be used in quantities sufficient to prevent airborne dust from leaving the site. Watering frequency would be increased whenever wind speeds exceed 15 mph. Non-potable water would be used whenever possible. • **AQ-6.** All dirt stockpile areas would be covered (e.g., with tarps). • **AQ-7.** Exposed ground areas that are planned to be reworked at dates more than one month after initial grading may be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established. All disturbed soil areas not subject to revegetation would be stabilized using chemical soil binders (e.g., polymeric stabilizers), jute netting, or other methods approved in advance by the MDAQMD. Specific details would be provided in the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3). Chemical soil binders, jute			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	netting, and any other methods implemented to control dust would be inspected and maintained per the manufacturer's recommendations throughout all project phases (construction, operations, and decommissioning) to ensure efficacy of the dust control method is maintained. In addition, inspection and maintenance activities would also be performed after any substantial events (e.g., large wind, dust, or rain storms) or as requested by the Combat Center. • **AQ-8.** Paving (e.g., for roadways, driveways, sidewalks, etc.), would be completed as soon as possible. In addition, building pads would be laid as soon as possible after grading unless seeding or soil binders are used (see measure AQ-7). • **AQ-9.** Vehicle speed for all construction/decommissioning vehicles would not exceed 15 mph on any unpaved (i.e., without asphalt) surface at the project site. • **AQ-10.** All trucks hauling dirt, sand, soil, or other loose materials would be either covered or loaded such that at least 2 feet of freeboard (minimum vertical distance between top of load and top of trailer) is maintained in accordance with California Vehicle Code Section 23114. • **AQ-11.** Either wheel washers would be installed where vehicles enter or exit unpaved roads from or onto streets, or trucks and equipment leaving the site would be washed. • **AQ-12.** Streets would be swept at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water would be used where feasible. • **AQ-13.** All measures to reduce fugitive dust and Valley Fever exposure would be shown on grading and building plans. • **AQ-14.** The private partner would designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent (%) opacity, and prevent transport of dust offsite. Monitors would have the authority, and responsibility, to cease construction/decommissioning activities (particularly soil-disturbing activities) during conditions that prevent adequate dust control (e.g., heavy wind or dust storms). Their duty hours would include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons would be provided to the Combat Center and the MDAQMD Compliance Division prior to the start of any grading, earthwork or demolition. • **AQ-15.** The private partner would ensure more water truck capacity and faster response to dusty conditions when needed. When visible dust exceeds 20% opacity on-site, or water trucks cannot sufficiently dampen the soil to suppress the dust, workers would be moved out of the area and/or additional employee protection would be provided. Note that the 20% opacity criteria may not provide sufficient worker protection as infection may be caused by inhalation of a very low number of spores, e.g., 10 or less. <u>Measures to Reduce Exposure to Valley Fever from Airborne Dust</u> • **AQ-16.** While developing the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3), the private partner would consult with the San Bernardino County Public Health Department and the California Occupational Safety and Health Administration (Cal/OSHA) to ensure that it minimizes the potential for exposure to Valley Fever.			

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
	Avoidance and minimization measures included in the Plan would be based on the best available standards at the time of review. The Plan would also include a program to evaluate the potential for exposure to Valley Fever from all project phases (construction, operations, decommissioning) and abandonment post-decommissioning and would include a protocol for monitoring ambient air for spores that cause Valley Fever if Valley Fever is found within the project area (see AQ-17). • **AQ-17.** Prior to commencing construction activities, the private partner would test the proposed project's soil for the fungus that causes Valley Fever to more clearly characterize the potential level of risk that the site might contain Valley Fever. Soil testing would be performed in the location(s) on the site identified by the subject matter experts as most likely to contain spores that cause Valley Fever. The testing protocol would be based on the best available standards at the time of testing. In any event, the testing protocol would be one that is reliable; as of September 2015, there are two protocols that meet this criteria (Barker 2015, Lauer 2015). If the result of any test sample is positive for Valley Fever, sensors would be utilized during project construction to monitor ambient air conditions at and around the project site for spores that cause Valley Fever. In conjunction with AQ-16, the protocol (e.g., the number of sensors, the type of sensors, and their placement) for this monitoring effort would be described in the Dust Abatement Plan/Health and Safety Plan. • **AQ-18.** Prior to commencing construction activities, the private partner would provide funding for offsite dust control/mitigation for expected dust emissions during the operational phase. Specifically, the private partner would develop and implement or fund a program for offsite mitigation of fugitive dust from existing sources at the Combat Center and surrounding communities (e.g., the City of Twentynine Palms) and would initiate this program such that the emission reduction project(s) are in place prior to commencing operation. Specific strategies and actual funding levels would be refined based on the final engineering and emission levels remaining after implementation of the operational portion of the Dust Abatement Plan/Health and Safety Plan. The private partner would provide the Combat Center and San Bernardino County with evidence of an MDAQMD-approved strategy, as well as evidence of complete funding, prior to commencing construction activities.			
Utilities	The Proposed Action would be sited within a reasonable proximity to interconnection facilities, and the energy generated by the Proposed Action would contribute to the Secretary of the Navy's initiative to generate power that would go into the civilian grid, a beneficial impact. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to utilities.	Under Alternative 2, utilities impacts would be similar to but less than those described under the Proposed Action/ Alternative 1, since the proposed transmission line under Alternative 2 would be located away from existing utilities for the majority of the proposed transmission route. This would also reduce the amount of construction work involving operational, or "hot," power	Under Alternative 3, utilities impacts would be similar to but less than those described under the Proposed Action/ Alternative 1, since the proposed transmission line under Alternative 3 would be located away from existing utilities for the majority of the proposed transmission route. This would also eliminate the need for construction work involving operational, or "hot," power	Under the No Action Alternative, the proposed PV, transmission line, and associated infrastructure would not be constructed, and existing conditions would remain unchanged. Therefore, there would be no impacts to utilities with implementation of the No Action Alternative.

Table 2-1. Summary of Environmental Consequences

Resource	Proposed Action/Alternative 1	Alternative 2	Alternative 3	No Action Alternative
		transmission lines. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to utilities.	transmission lines. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to utilities.	
	Avoidance and Impact Minimization Measures/SCMs included with the Proposed Action/Alternative 1, Alternative 2, and Alternative 3: • **UT-1.** To avoid design and construction conflicts with the Combat Center's internal utility network, a utility investigation would be conducted to obtain the exact depth and location of underground utilities (i.e., natural gas lines, wastewater lines, potable and non-potable water lines). • **UT-2.** Special consideration would be required for transmission pole replacement at the front of the wastewater detention ponds and during PV site construction near the existing overhead line. • **UT-3.** To avoid interrupting Combat Center operations, work along the entire transmission line would be completed while the existing power lines are operational, or "hot." • **UT-4.** The private partner would be responsible for: o adhering to conditions for application processes established by the California Independent System Operator, Southern California Edison (the local electrical utility), Federal Energy Regulatory Commission, and other entities, which include an application for interconnection, a systems impact study, and a facility study; and o off-installation utility upgrades required by the local utility for carrying the PV power, if necessary. • **UT-5.** The private partner would be responsible for obtaining the necessary water. It is expected that this water would come from one or more of the three nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District). The private partner would also be responsible for shipping the water to the project site via truck.			**Avoidance and Impact Minimization Measures/SCMs included with the No Action Alternative:** No avoidance and impact minimization measures/SCMs are proposed.

Notes: BR = Biological Resources; GR = Geological Resources; WR = Water Resources; CR = Cultural Resources; AQ = Air Quality; UT = Utilities.

In accordance with CEQ regulations, this EA focuses on those resource areas potentially affected by the action alternatives. Table 2-2 presents an abbreviated comparison of the environmental consequences to the resource areas potentially affected from implementation of the action alternatives. For a detailed description and analysis, refer to Chapter 3. Less than significant impacts were identified for each of the alternatives.

Table 2-2. Abbreviated Summary of Environmental Consequences

Resource Area	*Proposed Action/Alternative 1*	*Alternative 2*	*Alternative 3*	*No-Action Alternative*
Biological Resources	○	○	○	○
Geological Resources	○	○	○	○
Water Resources	○	○	○	○
Cultural Resources	○	○	○	○
Air Quality	○	○	○	○
Utilities	○	○	○	○

Note: ○ = Less than significant impacts.

2.6 PREFERRED ALTERNATIVE

The USMC has selected Alternative 3 as the Preferred Alternative.

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

NEPA, CEQ regulations, and DoN and USMC procedures for implementing NEPA specify that an EA should only focus on those environmental resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of impact. Accordingly, the discussion of the affected environment and associated environmental analysis presented herein focuses on biological resources, geological resources, water resources, cultural resources, air quality, and utilities. Conversely, the following resources were not carried forward for analysis in this EA, as potential impacts were considered to be negligible or non-existent.

Airspace. The Proposed Action would not affect airspace because it would have an anti-reflective coating that would improve light absorption and reduce or eliminate the potential for glint and glare impacts. Furthermore, the proposed project would be located outside of the established Special Use Airspace, Class-D Restricted Airspace, and restricted areas. Therefore, no significant impacts to airspace would occur with implementation of the Proposed Action.

Land Use. Although the Proposed Action would be partially located within the Twentynine Palms city boundary (see Figure 1-3), the Proposed Action would be located on federal land and would not change, modify, or conflict with existing land uses, including those identified in the Combat Center's Master Plan (MCAGCC 2009). Furthermore, Combat Center selected the project site because it is compatible with adjacent land use.

The Twentynine Palms City Council passed Ordinance 249 in January 2013 to prohibit the development of commercial solar farms within city boundaries. Ordinance 249 was passed in response to a variety of concerns raised by residents about the potential adverse impacts that commercial solar development might have on the City of Twentynine Palms. Concerns included the potential for such projects to impact the City's rural and scenic character, small town sense of community, economy, recreational and cultural opportunities, tax revenue, water resources, biological resources, air quality, health and safety, and overall quality of life (Basin Energy Assessment Team 2013).

Although the Proposed Action is not required to comply with City of Twentynine Palms Ordinance 249 because it would be located on federal land, it would generally not affect the concerns raised by local residents for several reasons. Since the Proposed Action is located entirely on federal land and access to the site by the general public is already restricted, there would be no impacts to off-installation land use, recreational opportunities, cultural opportunities, or tax revenue. Furthermore, since the Proposed Action would be located on the edge of the City of Twentynine Palms' boundary, adjacent to industrialized Mainside, there would be little to no impact to the City's rural character and small town sense of community. Therefore, no significant impacts to land use would occur with implementation of the Proposed Action. Potential impacts to the local economy, tax revenue, water resources, biological resources, air quality, and health and safety are discussed elsewhere in this chapter.

Aesthetics. The Proposed Action is not associated with a scenic vista or visual resource. While the nearest potential receptors would normally be the most sensitive due to proximity, the adjacent land outside of the Combat Center is sparsely populated (with no more than four residences located within 0.6 mile [1.0 km] of the Proposed Action site) and the Proposed Action would be partially or fully

screened to these residences by topography or vegetation. Due to the area's topography, people traveling north on Adobe Road at 2 Mile Road would have the greatest view of the proposed project, but at this distance (approximately 4.0 miles [6.4 km] from the southern edge of the project area), the project would blend in with the existing development shown in Figure 3-1. Therefore, no significant impacts to aesthetics would occur with implementation of the Proposed Action.

Recreation. The Proposed Action would be designed such that the adjacent on-installation running track would not be affected, and access to the proposed project area by the public is already restricted. As such, the Proposed Action would not affect recreational opportunities within or adjacent to the project area. Therefore, no significant impacts to recreation would occur with implementation of the Proposed Action.

Hazardous Materials and Wastes. The Proposed Action would not affect Munitions Response Program sites because none are located within the project area. The Proposed Action would not affect any current Installation Restoration sites, and the construction of the Proposed Action on closed Installation Restoration sites within the project footprint would not pose a hazard to construction workers. If either Alternative 2 or Alternative 3 were selected, the transmission line would be designed to span Installation Restoration Site 10 to avoid ground disturbance in this area. In the unlikely event that avoiding the site is not feasible, any excavated soil would be tested for waste characteristics and disposed of off-site at an appropriate landfill based upon the test results. Additionally, any backfill would be from clean import fill that has been sampled to ensure that there are no contaminants. Hazardous materials used during the construction phase would consist primarily of fuels and hydraulic fluid for vehicles and equipment. To minimize the potential for environmental impacts, contractors would be required to keep their equipment in good condition to prevent accidental spills/releases of fuels and hydraulic fluid on the job site and would also be required to have spill kits onsite to quickly contain any spill that might occur. As described in Section 3.3.4, *Environmental Consequences* for Water Resources, construction activities are required to populate the Combat Center's SWPPP and adhere to the Combat Center's requirements related to storm water pollution prevention. Small amounts of grease, lubricants, and paints would be used in the assembly of the solar PV system; these materials would be consumed in use. Contractors would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for the management of hazardous materials and hazardous waste, and to properly containerize, label, and dispose of all hazardous waste resulting from project activities. No polychlorinated biphenyls (PCBs) would be used in the construction of any of the project components (e.g., pole line transformers and switchgear) in the new switching/metering station on Berkeley Avenue. During the operational phase, hazardous material use would be minimal, mostly consisting of aerosol solvents and lubricants for equipment maintenance. These materials would also be consumed in use, and equipment maintenance personnel would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for hazardous waste. Therefore, no significant impacts with respect to hazardous materials and wastes would occur with implementation of the Proposed Action.

Transportation. The existing transportation network leading to the project site and within the Combat Center, including Adobe Road and Del Valle Road, operates at adequate capacity (USMC 2012). The proposed PV site and the majority of the Alternative 1 transmission line route are located along Adobe Road and Del Valle Drive. Adobe Road, a north-south, four lane roadway that links Mainside to the City of Twentynine Palms and State Route 62, is the primary transportation route to and from the installation. All visitors and vehicles with two or more axles must enter and exit via Adobe Road, where the installation's Main Gate is located. Adobe Road also serves as the principal arterial for military convoys moving off of the installation to access peripheral training areas.

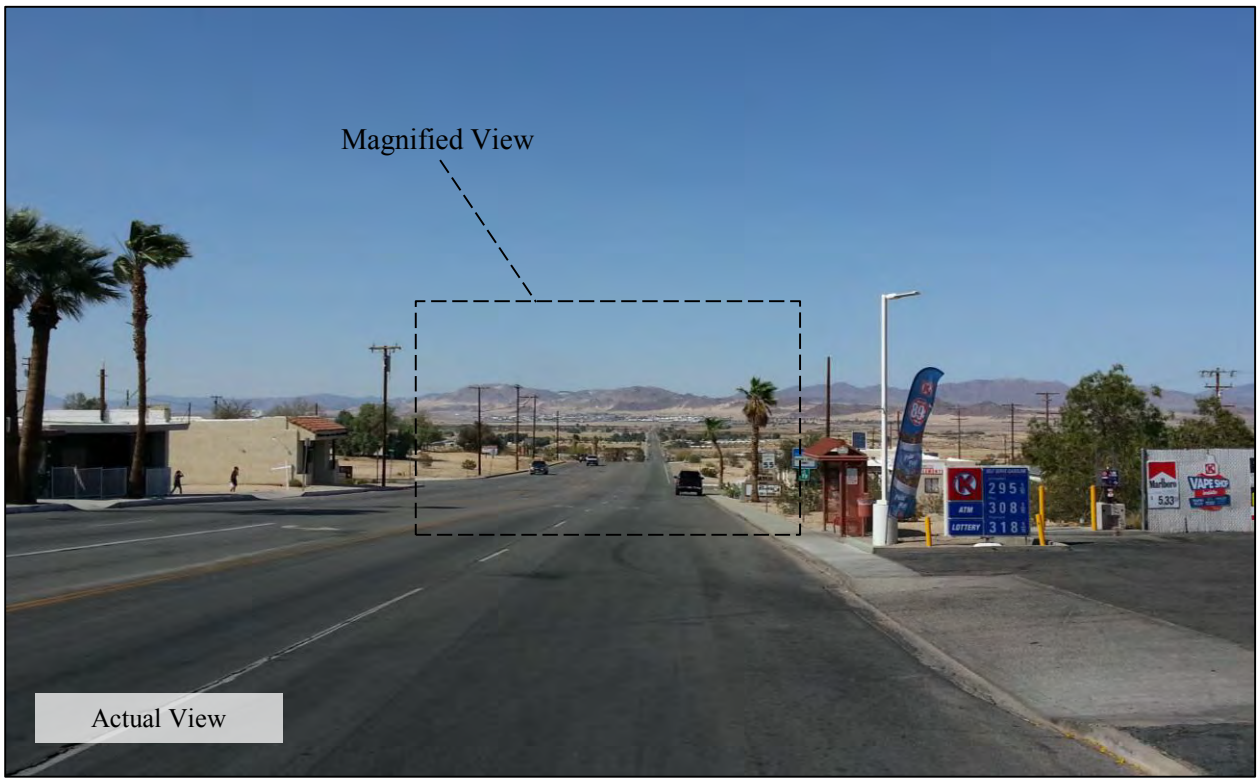

Figure 3-1 Existing Development Near the Proposed PV Site As Seen From 2 Mile Road at Adobe Road (4.0 miles [6.4 km])

The circulation system of Mainside consists of a small urban grid network of roadways, and Del Valle Road is the primary road servicing the Mainside grid. The intersection of Adobe Road and Del Valle Road is the key intersection within Mainside, with an average daily traffic volume of approximately 14,500 (USMC 2012).

Under the Proposed Action, the private partner would prepare and submit a traffic plan to the Combat Center's traffic engineer for review and approval to ensure that the temporary increase in traffic associated with worker trips and the delivery of equipment, materials, and water during construction and decommissioning activities, as well as worker and water truck trips during operations, would result in no more than a minor impact to traffic. During the operational phase, there would be no impact to transportation, as the maintenance activities would only require a small number of vehicle trips per year. Therefore, no significant impacts to transportation would occur with implementation of the Proposed Action.

Noise. Construction activities would require the use of heavy equipment for site preparation and development that would result in increased noise levels within the immediate area. However, the proposed solar PV site, the majority of the Alternative 1 transmission line route, and portions of the transmission line route under Alternatives 2 and 3, are located within a noisy area due to the proximity to Adobe Road, Del Valle Drive, and the Combat Center's Strategic Expeditionary Landing Field (SELF). Adobe Road and Del Valle Drive are routinely traversed by heavy equipment and tanks that can produce 75 decibels (dB) at 100 ft (30 m). All potential sensitive receptors near the proposed PV site at the Combat Center are located on the opposite side of Adobe Road or Del Valle Drive. Moderate noise levels between 60 dB and 65 dB reach the northwest portions of Mainside, including Berkeley Avenue, due to the SELF (MCAGCC 2009).

Adjacent land outside of the Combat Center is sparsely populated. Potential off-installation sensitive receptors include no more than four residences within 0.6 mile (1.0 km) of the proposed PV site, the nearest of which is more than 0.2 mile (0.3 km) from the southernmost edge of the proposed project boundary. The nearest off-installation sensitive receptor is also 0.2 mile (0.3 km) from Adobe Road.

Construction and decommissioning noise generated by the Proposed Action would be temporary, limited to regular working hours, and negligible when compared to the current noise environment. Recurring operational/maintenance activities would generate negligible amounts of noise. Therefore, no significant impacts to noise would occur with implementation of the Proposed Action.

Socioeconomics and Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations or Low-Income Populations*, requires federal agencies to consider human health and environmental conditions in minority communities and low-income communities. The Proposed Action would occur within the boundaries of a military installation, and the construction and operation activities associated with the Proposed Action would not result in a permanent change to population, ethnicities, or age distribution. The creation of up to 150 construction-related jobs for up to 2 years would provide a temporary benefit to the local economy. Furthermore, off-installation land near Mainside is sparsely populated and has a low value; as such, impacts to land value would be negligible. Moreover, since the proposed PV site would be located entirely on federal land, there would be no change to local tax revenue. As such, there would be no disproportionally high environmental or health impacts on low-income populations or minority populations from implementation of the Proposed Action. Therefore, no significant impacts to socioeconomics and environmental justice would occur with implementation of the Proposed Action, and the Proposed Action would comply with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*.

Public Health and Safety/Protection of Children. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, helps ensure that federal agencies' policies, programs, activities, and standards address environmental health and safety risks to children. The Proposed Action would be sited in accordance with established land use development guidelines addressing safety, functionality, and environmental protection zones. The project site is located in an industrial area of Mainside where access is controlled. The nearest sensitive receptor land uses (i.e., residences, schools, daycare centers, playgrounds or medical facilities) (Mohave Desert Air Quality Management District [MDAQMD] 2009) to the Proposed Action are a park named Felix Field, located 250 ft (76 m) east of the project boundary, and a residence, located 700 ft (213 m) northeast of the project boundary. No construction of additional housing is planned for any area immediately adjacent to the Proposed Action. Other sensitive receptors in the vicinity of the Proposed Action are a child development center 1,400 ft (426 m) to the east, and an elementary school 3,500 ft (1,066 m) to the southeast. Construction areas would be fenced during construction to prevent access by unauthorized persons, including children, and permanent fencing would be in place during the life of the project through decommissioning.

Ground disturbance during construction could result in the release of dust, which may carry spores from *Coccidioides immitis*, the fungus that causes coccidioidomycosis known as Valley Fever (University of Arizona Valley Fever Center for Excellence 2010a, 2010b, 2015). The majority (60%) of infected persons have symptoms so mild that they see no need for medical attention. Approximately one third of infected people will seek medical attention for fever, fatigue, cough, chest pain, headache, skin rash, and joint aches. The average recovery time is many weeks to many months in otherwise healthy people and is typically controlled by the infected person's immune system. Complications include residual lung nodules (approximately 5% of infections), lung cavities (approximately 5% of infections), and spreading, or dissemination, beyond the lungs (1% or less of the infections). Complications due to dissemination produce chronic illness and result in less than 200 deaths annually in the U.S. (University of Arizona Valley Fever Center for Excellence 2015). Once cured, people are usually immune to reinfection (Vugia et al. 2009, University of Arizona Valley Fever Center for Excellence 2015).

Although there are no racial or gender differences in susceptibility to primary infection by Valley Fever, there are differences in risk of disseminated infection. People with a suppressed immune system or diabetes, or women that are pregnant (particularly during the third trimester) have a higher risk of contracting a disseminated form of the disease. Complications are more frequent in men than in women and in adults than in children. Life-threatening infections are more common in the elderly. In addition, there is an increased risk of disseminated infection among African Americans, Filipinos, and perhaps other racial groups (University of Arizona Valley Fever Center for Excellence 2010c, 2015). At present, there is no vaccine for Valley Fever; avoiding activities associated with dust and airborne dirt of native desert soil is recommended but it is not a guaranteed means of prevention (Barker 2015; California Department of Public Health 2013a, 2013b; California Occupational Safety and Health Administration [Cal/OSHA] 2013; Center for Disease Control 2012, 2015; Lauer 2015; San Bernardino County Department of Public Health 2013; Valley Fever Center for Excellence 2010a; University of California [UC] Davis Health System 2014).

Each year, it is estimated that 150,000 people in the U.S. contract Valley Fever, many of whom are sick without knowing the cause or have symptoms so mild that they are not detected (UC Davis Health System 2014, Center for Disease Control 2013). About 25% of all cases occur in California (Center for Disease Control 2012). Within San Bernardino County and California in general, the number of reported cases of Valley Fever has gone through a series of spikes and lulls since the early 1990s (University of Arizona Valley Fever Center for Excellence 2015). The two most recent spikes occurred from 2005-2007 and

2010-2012 (Table 3-1). As shown in Table 3-1, Valley Fever infections have fallen substantially since 2012; it is suspected that this is likely due to the prolonged drought in California (Barker 2015). Valley Fever incidence rates in San Bernardino County are also substantially lower than the statewide average (Table 3-1). The Combat Center's database, which has records from 2009, has no record of any cases of Valley Fever onboard the Combat Center. The Combat Center's hospital has the means to differentiate between the flu and Valley Fever, and tests would be conducted if the provider determined that Valley Fever was a differential diagnosis. Any Valley Fever cases onboard the Combat Center would be reported to the Navy and Marine Corps Public Health Center and to San Bernardino County Public Health Services (MCAGCC 2015c).

Table 3-1. Valley Fever Incidence and Incidence Rates in San Bernardino County and California

Area	Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Valley Fever Incidence (Reported Cases)										
San Bernardino County	33	32	26	22	42	60	50	76	63	45
California	2,838	3,032	2,943	2,383	2,395	4,431	5,217	4,147	3,318	2,217
Valley Fever Incidence Rate (Reported Cases per 100,000 People)										
San Bernardino County	1.7	1.6	1.3	1.1	2.0	2.8	3.4	3.7	3.0	2.1
California	7.9	8.4	8.1	6.5	6.5	11.9	13.9	11.0	8.7	5.8

Sources: California Department of Public Health 2015a, 2015b; San Bernardino County Department of Public Health 2015.

Valley Fever is endemic to areas with low rainfall, high summer temperatures, and moderate winter temperatures in the southwest U.S., northern Mexico, a small portion of Washington State, and portions of at least six Central and South American countries. The understanding that Valley Fever occurs in the arid southwest of the U.S. has been understood since the early 1940s, when a large number of recruits that trained in the desert for World War II became ill. Aggressive dust control measures, and a reduction in exposure to dust, substantially reduced the incidence rate among trainees (Edwards and Palmer 1957, Goodyear 2014, Galgiani 2015). Within endemic areas, Valley Fever occurrence is spotty and most acreage appears free of the fungus that causes Valley Fever (Barker 2015, Lauer 2015, University of Arizona Valley Fever Center for Excellence 2015). While it is possible for wind to carry dust and Valley Fever spores hundreds of miles (Goodyear 2014, Lauer 2015), this is considered a relatively rare occurrence (University of Arizona Valley Fever Center for Excellence 2015, Barker 2015). Therefore, while disturbing soil will increase the risk of Valley Fever exposure, Valley Fever is more associated with living in or visiting endemic areas than it is with engaging in activities associated with heavy dust exposure (University of Arizona Valley Fever Center for Excellence 2015).

Based on various site characteristics found to be useful as indicators of where Valley Fever may grow and a general description of the project site (a dry lake bed with little vegetation in southern San Bernardino County) three experts have suggested there is moderate potential for at least a portion of the proposed project site to contain Valley Fever (Barker 2015, Lauer 2015, Dobos 2015). This is also consistent with an analysis of Valley Fever potential habitat within the arid southwest U.S. (Dobos 2014, 2015). Therefore, it is recommended that the soil be tested for the fungus that causes Valley Fever to confirm the level of risk.

Table 3-2 provides a list of site characteristics found to be useful as indicators of where Valley Fever may grow, the values for the proposed project site, and the values for two other sites that were tested and found to be positive near Bakersfield, California. It is important to note that Bakersfield is located within

Kern County, which has a substantially higher rate of Valley Fever infection than San Bernardino County where the proposed action is located.

Table 3-2. Site Characteristics Useful for Predicting Occurrence of Valley Fever

Site Characteristic	Valley Fever-Positive Sites Near Bakersfield, CA		Proposed Project Site	Notes
	Site 1	Site 2		
Soil Chemical Characteristics				
pH	8.5	7.8	8.3	High pH values promote Valley Fever growth; Valley Fever generally is not found in areas with pH values below 7.0. The proposed project site has a moderately high pH that is similar to other positive sites.
Electrical Conductivity (decisiemens/m)	5.0	0.5	11.4	High electrical conductivity values indicate soils are saline, and saline soils promote Valley Fever growth. The proposed project site's electrical conductivity has the potential for Valley Fever growth.
Soil Physical Characteristics				
Clay (%)	25.5	30.0	46.1	High concentrations of clay promote Valley Fever growth, but too much clay can cause soils to become overly compacted, thereby inhibiting both Valley Fever growth and rodent activity (see below). A 1:1:1 ratio of clay:sand:silt may be ideal. It is unclear whether the proposed project site's ratio of approximately 2:1:1 would promote or hinder Valley Fever growth.
Sand (%)	38.0	33.5	25.0	
Silt (%)	36.5	36.5	28.9	
Organic Matter (%)	0.98	1.5	0.36	Higher concentrations of organic matter promote Valley Fever growth; the proposed project site is marginally suited in this category and has a lower concentration than the other positive sites.
Site Biological Characteristics				
Is saltbush (*Atriplex* sp.) present?	Yes	No	Yes (very sparse)	Saltbushes (*Atriplex* sp.) also indicate saline soils and have been associated with the occurrence of Valley Fever, but this is not a requirement for growth. It is unclear if the sparse presence of saltbush at the proposed project site would promote Valley Fever growth.
Are rodents (or their burrows) present?	Yes	Yes	Burrows may be found along the lake bed edge but are generally lacking in the lake bed	Some, but not all, experts suggest that the presence of rodents may promote Valley Fever growth. Rodents increase organic matter content of soils, particularly around their burrows, and are susceptible to Valley Fever. If a rodent dies in a burrow, Valley Fever may grow on its carcass. The general lack of burrows at the project site may reduce the likelihood of finding major Valley Fever "hot spots" in the project area.

Sources: Barker 2015, Dobos 2015, Lauer 2015, MCAGCC 2015d, USDA 2015.

As of September 2015, there are two different protocols that can be used to reliably test soil. Both of these protocols were developed recently; as such, many public health departments erroneously state that soils cannot be reliably tested. Due to her expertise in Valley Fever in California, it is recommended that the testing protocol developed by Dr. Antje Lauer at California State University, Bakersfield be implemented (Barker 2015, Lauer 2015). It is expected that, if a high-risk "hot-spot" of Valley Fever

occurred within the proposed project site, it would be detected with as few as 10-20 samples (Lauer 2015). However, even if all samples are negative, the site would be classified as "low risk" as it is not possible to state with certainty that there is no risk. As such, it is recommended that all proposed avoidance and impact minimization measures (see Table 2-1) be implemented to minimize (1) the amount of dust generated, (2) the amount of exposure to any generated dust, and (3) any potential risk of Valley Fever (Barker 2015; Center for Disease Control 2012, 2015; California Department of Public Health 2013a, 2013b; Cal/OSHA 2013; Lauer 2015; San Bernardino County Department of Public Health 2013; Valley Fever Center for Excellence 2010a; UC Davis Health System 2014).

The greatest risk from Valley Fever to public health and safety in areas that are known to, or may contain, the pathogen is to construction personnel as they are the closest in proximity to ground-disturbing activities. The implementation of dust minimization and control measures, however, can protect construction personnel from the disease (Barker 2015, California Department of Public Health 2013b).

While Guevara et al. (2015) stated that "being in an area in sight of construction and being in an area in sight of earth excavation had the strongest associations with cases residing in endemic health districts," and the precise level of risk to people living or working onboard the Combat Center near the proposed project site is unclear, it is expected that the level of risk is relatively low for several reasons. First, as mentioned above, Valley Fever incidence rates in San Bernardino County are also substantially lower than the statewide average. Second, there are no records of Valley Fever cases in the Combat Center's database, which dates to 2009, despite the very large number of people living, working, and training onboard the Combat Center since this time. Third, the study performed by Guevara et al. (2015) was limited to projects and populations from 1973-2011, when little, if any, avoidance and minimization measures were implemented to reduce dust and potential exposure to Valley Fever. Fourth, the Proposed Action includes avoidance and minimization measures to test for Valley Fever at the site prior to construction and to control dust and reduce potential exposure to Valley Fever based on the best available standards at the time the project is implemented. Fifth, at least one expert has suggested that, based on field tests, the potential off-site risks to the public health and safety of people that may be downwind are minimal. Specifically, ambient air sensors capable of detecting Valley Fever spores were placed 100 ft (30 m) downwind of a site known to contain Valley Fever. The site was then disturbed and dust was released but no Valley Fever was detected by the sensors; indeed, the sensors only detected Valley Fever when large piles of soil containing Valley Fever were placed in front of the sensors and dust was blown onto the sensors using leaf blowers (Barker 2015).

It is possible that wetting the soil during construction to control dust could promote subsequent growth of the fungus that causes of Valley Fever (Barker 2015, Lauer 2015). However, wetting the soil for dust control is still a recommended mitigation measure (Barker 2015, Lauer 2015) and all disturbed soil areas not subject to revegetation would be stabilized using chemical soil binders (e.g., polymeric stabilizers), jute netting, or other methods approved in advance by the Mojave Desert Air Quality Management District (MDAQMD), thereby minimizing water use.

The risk of Valley Fever during operations is minimal as dust control measures would continue to be implemented and ground disturbance would cease. Assuming a vaccine is not developed within the next 35 years, before decommissioning activities begin, the risk of Valley Fever during decommissioning is expected to be the same as that during construction as all applicable construction-related dust minimization measures would be implemented during decommissioning.

Therefore, for the reasons described above and with the implementation of the proposed avoidance and minimization measures/SCMs, implementation of the proposed project would not pose a significant new

risk to public health or safety, and no significant impacts to public health and safety, schools, or to the protection of children would occur. In addition, the Proposed Action would comply with EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*.

3.1 BIOLOGICAL RESOURCES

3.1.1 Definition of Resource

Biological resources include plants and animals and the habitats in which they occur. Biological resources are further subdivided into Plant Communities, Wildlife, and Special Status Species. Special consideration is given to bird species protected under the Migratory Bird Treaty Act (MBTA) and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Special Status Species include federally-listed, proposed, and candidate threatened, and endangered plant and wildlife species, state of California threatened and endangered species, and species of concern as recognized by state or federal agencies.

3.1.2 Regulatory Framework

Biological resources occurring in the proposed 241-ac (98-ha) solar PV site and transmission line routes that would potentially be impacted by project activities are protected by, and managed in accordance with, the following statutory and executive requirements:

- Endangered Species Act (16 USC §§ 1531-1599);
- MBTA (16 USC §§ 703-712) and EO 13186;
- EO 11990 – *Protection of Wetlands*; and
- EO 13112 – *Invasive Species*.

3.1.3 Affected Environment

3.1.3.1 Plant Communities

The proposed solar PV site is located on the eastern portion of Mesquite Dry Lake, a desert playa that ponds infrequently except following major storm events. The site consists of vacant, previously disturbed land that was formerly used as an airfield. The majority of the solar PV site is unvegetated and is mapped as urban and playa, dry lake bed with sparse vegetation, as presented on Figure 3-2 (MCAGCC 2015a). Playas fill after heavy rains or thunderstorms from direct precipitation and ephemeral surface flow from shallow drainages. Low infiltration rates in the playas are due to clay soils. Evaporation of playa waters results in alkali salts on the playas (MCAGCC 2012a).

The Proposed Action/Alternative 1 transmission line corridor is 2.6 miles (4.2 km) long and consists of creosote bush shrubland, playa, and urban areas (Figure 3-2). Creosote bush shrubland is sparsely vegetated and dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*), with variable cover of annuals depending on rainfall (MCAGCC 2009, 2012a). The majority of the Proposed Action/Alternative 1 transmission line corridor is within urban areas adjacent to a sewage treatment plant and a residential housing area.

The Alternative 2 transmission line corridor is 2.9 miles (4.7 km) long and also consists of creosote bush shrubland, playa, and urban areas.

The Alternative 3 transmission line corridor is also 2.9 miles (4.7 km) long, but at Berkeley Avenue the new transmission line would exit the Combat Center and be located outside of the Combat Center.

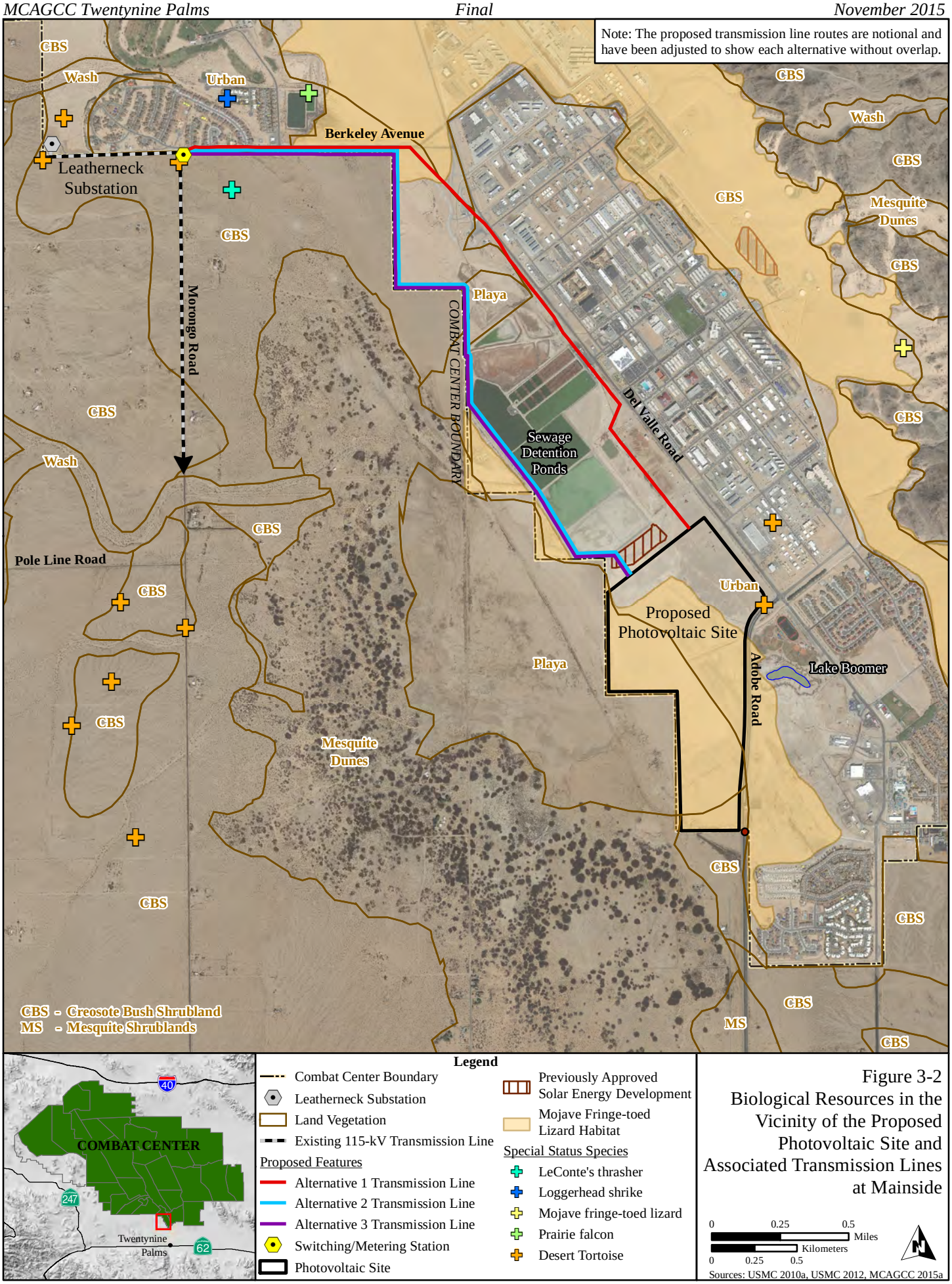

Figure 3-2
Biological Resources in the Vicinity of the Proposed Photovoltaic Site and Associated Transmission Lines at Mainside

3.1.3.2 Wildlife

The proposed solar PV site and transmission line corridor(s) would likely support side-blotched lizard (*Uta stansburiana*); small mammals including kangaroo rats (*Dipodomys* spp.) and pocket mice (*Chaetodipus* spp.); and migratory and resident birds including house finch (*Carpodacus mexicanus*), common raven (*Corvus corax*), great-horned and barn owls (*Bubo virginianus* and *Tyto alba*), and greater roadrunner (*Geococcyx californianus*) (California Herps 2014, MCAGCC 2012a, USMC 2010a). Mallards (*Anas platyrhynchos*), American coots (*Fulica americana*), and other migratory birds that are likely to use Lake Boomer and the sewage detention ponds will fly over the project area (see Figure 3-2). When filled with water, Mesquite Dry Lake attracts waterfowl (MCAGCC 2012a). Shorebirds (e.g., killdeer [*Charadrius vociferus*], American avocet [*Recurvirostra americana*], and black-necked stilt [*Himantopus mexicanus*]) have the potential to forage in the playa of the proposed solar PV site after a large rain event. All of the aforementioned bird species are protected under the MBTA.

3.1.3.3 Special Status Species

A California Department of Fish and Wildlife (CDFW) California Natural Diversity Database query for known occurrences of special-status species in the vicinity of the project area was conducted (CDFW 2014a). Based on the query, the habitat that occurs within the project area, and past projects and surveys in the area, the only federally-listed wildlife species with the potential to occur in the project area is the Agassiz's desert tortoise (*Gopherus agassizii*).

The proposed solar PV site and transmission line corridor is adjacent to Agassiz's desert tortoise foraging and burrowing habitat (see Figure 3-2). The proposed solar PV site consists of hard clay soil and compacted urban soil that is not suitable for digging burrows. The majority of the transmission line corridors are within urban areas. Although the desert tortoise occurs nearby, the species is almost never found on playas and tends to avoid them (MCAGCC 2014a).

Tortoises have been spotted adjacent to and near both the PV site and western portion of the transmission line, especially near Berkeley Road (see Figure 3-2). A desert tortoise was hit and killed by a vehicle in the developed area northeast of the proposed PV site, and one desert tortoise has been observed on several occasions near Leatherneck Substation (MCAGCC 2014a, 2015a). Other tortoises have been observed approximately 1.5 miles (2.4 km) west of the proposed solar PV site (see Figure 3-2) (USMC 2010a). In June 2015, a tortoise was struck and killed on Morongo Road, south of Pole Line Road (see Figure 3-2) (MCAGCC 2015c). Tortoises in the vicinity of the project area could use the project area for dispersal or other overland movement.

The Mojave fringe-toed lizard (*Uma scoparia*), a California species of special concern, is likely to occur in the project area. Approximately 180.5 ac (73.0 ha) of the project area is mapped as Mojave fringe-toed lizard habitat (MCAGCC 2012a, 2015a). Mojave fringe-toed lizard habitat consists of sparsely-vegetated areas with fine wind-blown sand (California Herps 2014, Jones and Lovich 2009).

Three USFWS birds of conservation concern, loggerhead shrike (*Lanius ludovicianus*) (CDFW species of special concern), prairie falcon (*Falco mexicanus*) (CDFW watch list species), and Le Conte's thrasher (*Toxostoma lecontei*) (CDFW species of special concern), have been documented near the transmission line corridor (see Figure 3-2) (MCAGCC 2015a; CDFW 2014a, 2014b).

No special status plants are known to occur in the project area (California Native Plant Society 2015, CDFW 2014a, MCAGCC 2015a).

3.1.4 Environmental Consequences

The significance of potential impacts to biological resources is based on: (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration or ecological ramifications of the impact(s). Impacts to biological resources would be significant if species or habitats of concern were adversely affected over relatively large areas or if disturbances caused reductions in population size or distribution of a special status species.

Avoidance and Impact Minimization Measures and SCMs listed in Table 2-1 would be implemented to minimize impacts to biological resources under the Proposed Action/Alternative 1, Alternative 2, and Alternative 3.

3.1.4.1 Proposed Action/Alternative 1

<u>Construction</u>

Under the Proposed Action/Alternative 1, approximately 241 ac (97 ha) of sparsely vegetated land on the eastern portion of Mesquite Dry Lake mapped as urban and playa habitat would be converted to a solar PV system. The urban and playa habitats currently provide marginal habitat for wildlife (for which better habitat is generally available in the vicinity) and do not contain suitable burrowing habitat for desert tortoises. These areas represent poor-quality habitat that would not support maintenance or recovery of the desert tortoise and would likely not support an individual tortoise. No tree removal would be required for construction of the solar PV system.

Construction activities would likely have minimal impacts on wildlife populations. Wildlife in the vicinity of construction activities would be exposed to aural and visual disturbance from human presence and construction equipment. Use of construction equipment and vehicles could potentially crush and/or injure wildlife, primarily burrow-dwelling animals, and species with slower or constrained mobility (e.g., snakes and lizards). More mobile species, like birds and large mammals, are likely to relocate and utilize an adjacent habitat area if they are present during construction. However, because of the relative lack of suitable wildlife habitat in the potential PV site, the likelihood of such impact is relatively low.

Special status wildlife species would be subject to the same impacts described in the above paragraph. The Proposed Action could potentially result in permanent and temporary impacts to special status wildlife species. Permanent impacts to special status wildlife species could include: habitat fragmentation, where removal of habitat elements results in isolated patches of formerly connected habitat; edge effects that could increase the potential for non-native plant and opportunistic species invasion (e.g., common raven, coyote, and feral dog); alteration of hydrology, runoff, and sedimentation, which may cause alterations to plant species composition and habitats used by special-status wildlife species. Avoidance and Impact Minimization Measures and SCMs listed in Table 2-1 would lessen the significance of these impacts.

Suitable Mojave fringe-toed lizard habitat is located near much of the solar PV site and transmission corridors, and the potential for occurrence there is moderate (see Figure 3-2). In addition to habitat loss, construction activities may result in temporary displacement of individuals, injury or mortality by equipment or vehicles, and increased susceptibility to predation during construction. Because the species lays its eggs in the sand (Hollingsworth and Beaman 1998), construction activities may destroy eggs that are within the project area during the breeding season (May – July). Compaction of sandy areas due to construction and vehicular traffic may degrade habitat suitability for this fossorial species. Avoidance

and Impact Minimization Measures and SCMs listed in Table 2-1 (e.g., BR-8, BR-9, BR-10, and BR-15) would reduce impacts to the Mojave fringe-toed lizard.

Although desert tortoises have the potential to transit through the project area, the proposed solar PV site consists of hard clay soil and compacted urban soil that is not suitable for digging burrows. The majority of the transmission line corridors are within urban areas. Although the desert tortoise occurs nearby, the species is almost never found on playas and tends to avoid them (MCAGCC 2014a). Therefore, it is unlikely that a desert tortoise will be encountered during construction activities, and direct impacts to desert tortoises from the implementation of the Proposed Action/Alternative 1 are unlikely. As described in Table 2-1, the proposed solar PV site would be surveyed for desert tortoises and monitored by an Authorized Biologist (AB) prior to and during construction. The proposed solar PV site would be fenced during the construction and operations phases to exclude desert tortoises from the area.

The potential exists for desert tortoises to be injured or killed by construction equipment and vehicles. Therefore, as listed in Table 2-1, pre-construction clearance surveys at all proposed construction areas would be required before commencing construction activities. Additionally, if a desert tortoise is encountered during construction, appropriate measures listed in Table 2-1 would be implemented to minimize impacts to the species. Per the Basewide Biological Opinion, if a tortoise is found in the action area during ground breaking activities, all ground breaking activities must halt until NREA is contacted and NREA processes the tortoise and authorizes ground-breaking activities to resume. Following construction, the temporary tortoise fencing would be removed. In addition, construction vehicles would drive 20 miles (32 km) per hour or less in construction areas and on access roads. Speed limits would be clearly marked by the private partner, and workers would be made aware of these speed limits. Also, vehicles parked outside of exclusion fencing would be inspected underneath for desert tortoises immediately before the vehicle is moved. If a desert tortoise is found under a vehicle, the vehicle would not be moved, NREA would be contacted immediately, and the tortoise would be monitored for its safety until NREA processes the tortoise.

Operations and Maintenance

Although the solar PV panels would alter the sun/shade regime of the ground and plants below them, it is expected that sparse vegetation would reestablish during the operations and maintenance phase. Consistent with BR-16, the private partner would prepare and submit a Weed Management Plan to the NREA for review and approval. Once approved, the private partner would be responsible for implementing the Weed Management Plan.

Chain link fencing around the solar PV site would present barriers to wildlife overland movement, especially to larger species. However, larger animals would likely be able to move around the fences without expending energy to the point of affecting major life functions. Smaller species, such as lizards and rodents, would be able to fit through the chain link fencing. Still, the solar panels themselves and the fencing surrounding the solar arrays would alter the local environment to the point that hiding spots, predator/prey relationships, and food availability would likely be changed.

Migratory birds, including USFWS birds of conservation concern described in Section 3.1.3.3, *Special Status Species*, are likely to transit through, roost, forage, and possibly nest in the solar PV site. The loss of the eastern portion of the playa habitat (the Mesquite Dry Lake bed) would not significantly impact migratory birds as they would be able to continue to forage after rainfall events in the large area of playa habitat west of the project area (see Figure 3-2).

Solar PV panels over and adjacent to the playa would potentially pose a risk to bird and bat species. Bird and bat mortalities have been documented at utility-scale solar projects in southern California (Kagan et al. 2014; Bureau of Land Management 2014). Three main causes of bird mortality have been documented at solar energy facilities in southern California: impact trauma, solar flux, and predation (Kagan et al. 2014). Solar flux has been identified as a major threat to bird species at solar power towers that use mirrors to focus solar energy to a tower. However, in Kagan et al. (2014), of 61 bird deaths analyzed at a solar PV system, solar flux was not documented as a cause of death in a single case, as solar PV systems do not create temperatures high enough to scorch flying birds.

Impact trauma was the leading cause of bird death documented at a single PV site in southern California in 2014 (Kagan et al. 2014). A large proportion of birds killed at utility-scale solar projects die from striking project components because panels are oriented vertically, or as a result of apparently mistaking the solar arrays for water (Kagan et al. 2014). "Lake effect" is commonly used to describe the phenomenon whereby birds and their insect prey can mistake a reflective solar facility for a water body because they share several characteristics, namely large, smooth, dark surfaces that reflect horizontally polarized sunlight and skylight (Upton 2014).

Many insects rely on polarized light as a cue to indicate the presence of lakes and rivers (Horvath et al. 2010). Aggregations of flying insects at PV panels attract insect-eating birds and/or bats, thereby increasing the likelihood of bird/bat collisions with PV panels (Kagan et al. 2014). Although PV panels are inherently absorptive (i.e., non-reflective), they do reflect horizontally polarized light similar to the way a lake's smooth, dark surface horizontally polarizes reflected sunlight and skylight. This feature may confuse birds that use polarized light for orientation or behavioral cues (Desert Renewable Energy Conservation Plan Independent Science Advisors 2010). The lake effect seems to be most influential when panels or heliostats are oriented horizontally, collectively forming a smooth, continuous surface (Kagan et al. 2014). This effect could be intensified after rainfall events when the proposed solar PV site could visually connect to the water in the playa. In Kagan et al. (2014), birds for which the primary habitat is water, including coots, grebes, and cormorants, were over-represented in an inventory of mortalities at a PV facility in southern California (44%) compared to other bird species. The proposed PV site occurs in a dry lake bed and is adjacent to Lake Boomer (see Figure 3-2), both of which attract waterfowl and shorebirds when water is present. It is likely that nearby bodies of water that birds can readily use can increase the lake effect of solar PV systems and subsequent bird impacts (Kagan et al. 2014).

Estimating the number of birds that may be injured or killed due to lake effect as a result of the Proposed Action is impossible at this time because of the lack of studies on this phenomenon as it relates to solar projects. Under Section 1502.22 of CEQ Regulations for Implementing NEPA, "when an agency is evaluating reasonably foreseeable … adverse effects on the human environment … and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 CFR § 1502.22). While the collective evidence suggests that the lake effect does contribute to avian mortalities on solar PV projects, no scientifically rigorous studies have been conducted to test the validity of this conclusion. However, based on the available data, it is clear that utility-scale solar power projects have the potential to cause some mortality to birds and bats. Efforts to minimize potential lake effect impacts to birds and bats from the implementation of the Proposed Action can still be achieved through the use of best available science and appropriate design specifications to be implemented during construction.

Since the current science on the subject of lake effect mortality is limited, it is recommended to incorporate an adaptive management strategy into the design and operation of the facility. For example, the efficacy of measures that could reduce wildlife mortality, such as providing visual or auditory deterrence, or interspersing gaps or features that break up the visual continuity of the dark surface, could be tested. Results from monitoring (see below) could inform the subsequent design process.

The proposed location does not support large concentrations of migratory birds or bird species of special concern that would be especially vulnerable to the potential lake effect of the panels. While acknowledging the incompleteness of the current data on the topic, it seems reasonable to conclude that any lake effect-related bird strikes at the proposed location would not rise to the level of a significant impact for purposes of NEPA analysis. Therefore, the Proposed Action/Alternative 1 is not expected to substantially adversely affect bird and bat populations as a result of mortalities related to lake effect.

As discussed in Table 2-1, monthly monitoring of the solar PV site would be conducted to assess any potential impacts the PV arrays might be having on wildlife and special status species, including visual reconnaissance of dead and/or injured species. In addition, personnel working onsite would also record wildlife use of the project area. Results of the surveys and the data collected by project personnel would be provided to the NREA in quarterly reports for comments and recommendations to minimize impacts from continuing operations.

The Mojave fringe-toed lizard may be exposed to long-term predation vulnerability during operation and maintenance of the solar PV system due to vegetation loss, which decreases dispersal and refuge opportunities from predators. In addition, the solar PV system and associated structures may increase perching opportunities for predators (e.g., common raven); therefore, making the Mojave fringe-toed lizard more vulnerable to predation.

Under the Proposed Action/Alternative 1, the likelihood of impacts to the desert tortoise during operation and maintenance of the solar PV system would be extremely low because fencing would deter tortoises from entering the PV site and there is no suitable burrowing habitat in the project area. Monthly monitoring of the solar PV arrays would be conducted, and opportunistic data would be collected by project personnel, to assess the potential use of the project area by wildlife, including special status species. Results of the surveys and monitoring would be provided to the NREA in quarterly reports for comments and recommendations to minimize impacts from continuing operations.

Decommissioning

Decommissioning of the solar PV system would have similar impacts to construction activities. Work crews, vehicles, and equipment would require access to the sites for removal of all solar PV materials. All relevant construction Avoidance and Impact Minimization Measures and SCMs listed in Table 2-1 would be followed during decommissioning activities. Consistent with BR-14, a revegetation and seeding plan approved by the NREA would be implemented following decommissioning activities to restore the site to pre-project conditions.

As it is expected that during operation of the solar PV sites, certain species would have become established in the habitats in and/or adjacent to the project area, including certain special status species, an NREA-approved biological monitor would survey the solar PV site for mammals, reptiles, and/or nesting birds prior to decommissioning activities. If nesting or denning animals are found to occur in the solar PV sites, they would be allowed to leave the sites on their own accord or would be passively relocated during the avian non-breeding season (October – January) prior to the start of decommissioning activities. If federally-listed species are found to occur in the solar PV site prior to the start of decommissioning

activities, then activities will halt, NREA will be contacted, and the private partner would plan further action to avoid take of the listed species.

Transmission Line

Under the Proposed Action/Alternative 1, the addition of approximately 2.6 miles (4.2 km) of new 115-kV overhead transmission line has the potential to adversely affect bird species, including special status birds. The new line would be used for perching, but would also represent a collision hazard for birds, especially during periods of low visibility. However, overhead transmission lines are already abundant in the vicinity of the project area and are part of the local environment. In addition, all transmission towers, poles, and lines would be designed and constructed in accordance with the guidelines in Avian Power Line Interaction Committee (APLIC) (2006 and 2012), or the most current version of the guidelines available at the time of construction, to minimize collision and electrocution hazards of migratory birds from transmission lines.

As described in Table 2-1, an NREA-approved AB would conduct pre-construction surveys at each location where a new steel pole would be installed. Temporary desert tortoise exclusion fencing, under monitoring by an NREA-approved AB, would be built around the construction area for each steel tower that would support the new transmission lines. These measures would reduce the likelihood of directly impacting wildlife and sensitive species.

Conclusion

Implementation of the Proposed Action/Alternative 1 would directly impact approximately 241 ac (97 ha) of sparsely vegetated land on the eastern portion of Mesquite Dry Lake mapped as urban and playa habitat. Wildlife and special status species, namely the desert tortoise and Mojave fringe-toed lizard, would potentially be exposed to direct and indirect impacts. However, with implementation of Avoidance and Impact Minimization Measures and SCMs listed in Table 2-1, the Proposed Action is not likely to incidentally take or otherwise adversely affect desert tortoises, and effects to Mojave fringe-toed lizards and other wildlife species and their populations would be less than significant. Per the Basewide Biological Opinion, with the implementation of the proposed Impact Minimization Measures and SCMs listed in Table 2-1, consultation with the USFWS is not necessary. Monthly monitoring of the solar PV site would be conducted, and opportunistic data would be collected by project personnel, to assess any potential negative effects to migratory birds and other species. Therefore, implementation of the Proposed Action/Alternative 1 would have less than significant impacts to biological resources.

3.1.4.2 Alternative 2

Impacts to biological resources under Alternative 2 would be nearly identical to those under the Proposed Action/Alternative 1. Alternative 2 would be implemented in accordance with the same Avoidance and Impact Minimization Measures and SCMs as the Proposed Action/Alternative 1. Therefore, implementation of Alternative 2 would have less than significant impacts to biological resources.

3.1.4.3 Alternative 3

Impacts to biological resources under Alternative 3 would be nearly identical to those under the Proposed Action/Alternative 1. Alternative 3 would be implemented in accordance with the same Avoidance and Impact Minimization Measures and SCMs as the Proposed Action/Alternative 1. Therefore, implementation of Alternative 3 would have less than significant impacts to biological resources.

3.1.4.4 No Action Alternative

Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center. Therefore, implementation of the No Action Alternative would have no impact to biological resources.

3.2 GEOLOGICAL RESOURCES

3.2.1 Definition of Resource

Geological resources are generally defined as the topography, geology, soils, and geologic hazards within a given area. Topography generally refers to elevation, slope, and surface features found within a given area. Geology includes bedrock materials, mineral deposits, and fossils. Soil refers to unconsolidated earthen materials overlying bedrock or other parent material. Geologic hazards can include many phenomena including landslides and earthquakes.

3.2.2 Regulatory Framework

Construction plans are reviewed for conformance with provisions of the Alquist-Priolo Earthquake Fault Zoning Act (California Public Resource Code §§ 2621-2630; 1972 amended 1994) and State Seismic Hazards Mapping Act (California Public Resource Code §§ 2690-2699, 1990); and the California Building Code (California Seismic Safety Commission 2005). The Alquist-Priolo Act prohibits the construction of "structures intended for human occupancy" within 50 ft (15 m) of an active fault. An "active fault" is a fault that has been active within the Holocene Epoch (i.e., in the past 11,000 years). A "structure for human occupancy" is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year (14 California Code of Regulations Article 3). The proposed solar PV site does not include any structures for human occupancy.

3.2.3 Affected Environment

3.2.3.1 Topography

The mountains surrounding the project area vary in elevation from 3,500 ft (1,100 m) to more than 5,000 ft (1,500 m) above mean sea level. However, the project area is located within a broad alluvial plain and dry lake bed that has relatively flat topography with minimal changes in slope and elevation.

3.2.3.2 Geology

The project area is within the south central Mojave Desert Geomorphic Province. This province is characterized by expansive desert with isolated fault-controlled, northwest-trending mountain ranges. The project area lies within a west-southwest sloping alluvial plain bound to the east by the southern Bullion Mountain range and to the west by an eastern sloping alluvial plain east of the Copper Mountains. The Combat Center geology consists of tertiary basement rock with overlying quaternary alluvial deposits. The basement rock is nearly impermeable except where it has been fractured or weathered. Sediments at the project area are estimated to range in age from Holocene to Pliocene (the Pliocene Epoch refers to time period from 2.6 to 5.3 million years ago). Deposition is still ongoing, with the youngest sediments filling drainage channels and young lake beds. Mesquite Dry Lake is a playa composed of stratified impermeable alluvium deposits (Figure 3-3). There are no known mineral deposits of value or fossils in the project area.

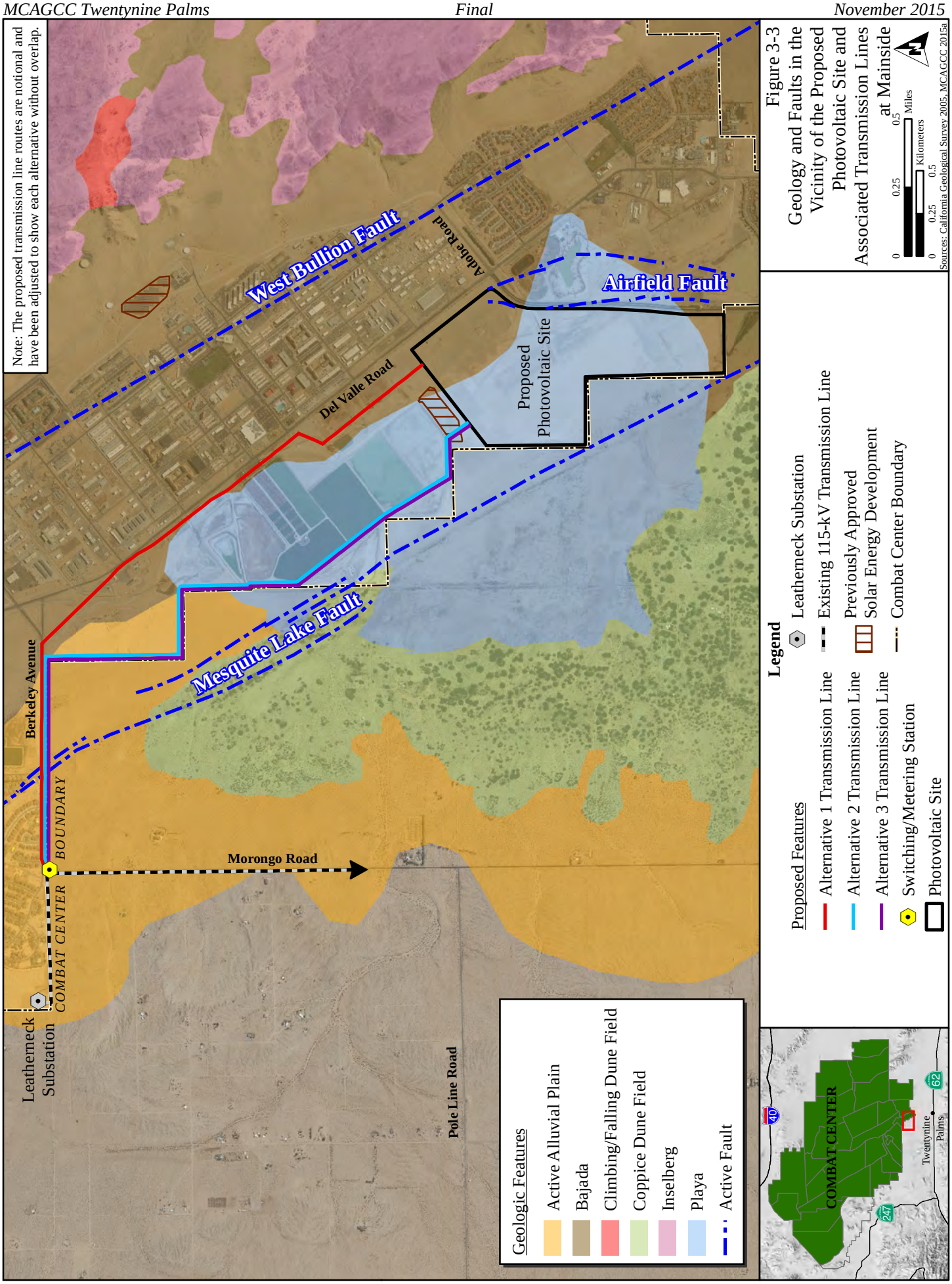

Figure 3-3
Geology and Faults in the Vicinity of the Proposed Photovoltaic Site and Associated Transmission Lines at Mainside

3.2.3.3 Soils

The predominant soils in the project area generally consist of younger alluvium and older alluvium derived from the Mesozoic-age Bullion Mountain range containing granitic rocks consisting of biotite-rich quartz monzonite (MCAGCC 2012b). Younger Alluvium is typically unconsolidated silt, sand, and gravel deposited in active washes and on active to recently active alluvial fan and valley surfaces. Calcio-Edalph-Calcio, Urban land-Cajon complex, Cajon loamy sand, and typic haplosalids (playa) soils are located in the project area (Figure 3-4). These soils have slight erosion potential and are not classified as prime farmland soils (U.S. Department of Agriculture [USDA] 2014). All soils but the typic haplosalids (playa) have good drainage and low shrink-swell potential; the typic haplosalids located in Mesquite Dry Lake have poor drainage and high shrink-swell potential (USDA 2014). The composition of surface soils (i.e., 0-6 inch depth) is provided in Table 3-3.

Table 3-3. Composition of Soils in the Project Footprint

Soil Unit	Texture Classification	Clay (%)	Silt (%)	Sand (%)
Calcio-Edalph-Calcio	sandy loam	14.8	19.7	65.5
Urban land-Cajon complex	course sand	N/A	N/A	N/A
Cajon loamy sand	loamy sand	6.6	11.9	81.5
Typic Haplosalids	clay	46.1	28.9	25.0

Notes: N/A = Not Available; composition percentages are for the upper 6 inches of soil.
Source: USDA 2014.

3.2.3.4 Geologic Hazards

The Combat Center is located within a seismically active region within the Eastern California Shear Zone. The Eastern California Shear Zone is thought to accommodate approximately 20–25% of total relative motion between the Pacific and North American plates. In the Mojave Desert, the Eastern California Shear Zone comprises a 62-mile (100-km) wide network of faults.

The Proposed Action/Alternative 1 project area is adjacent to and crosses the Mesquite Lake Fault (see Figure 3-3). The Mesquite Lake Fault is estimated to be capable of generating an earthquake of magnitude 7.3 if it ruptures with other faults to the north (City of Twentynine Palms 2012). The West Bullion Fault is also located near the project area. In 1999, a magnitude 7.1 earthquake, known as the Hector Mine earthquake, ruptured the Lavic Lake Fault and the East and West Bullion sections of the Pisgah-Bullion fault zone, with the epicenter approximately 25 miles (40 km) north of the project area. The West Bullion Fault lies within the Mainside and in close proximity to the project area (see Figure 3-3). Currently, the West Bullion Fault is not defined as active under the Alquist-Priolo Earthquake Fault Zoning Act. However, recent fault rupture analysis reports determined the potential for fault rupture within the project area to be low but also recommend that the fault be classified as active (MCAGCC 2012b, 2012c). The Airfield Fault is an open fissure on the southeastern bank of Mesquite Dry Lake located to the east of the proposed project area (see Figure 3-3). The fissure is believed to have been caused by the creeping of West Bullion and Mesquite Lake faults that caused tensile and compressive stresses in the soil mass in directions approximately 45 degrees from the faults.

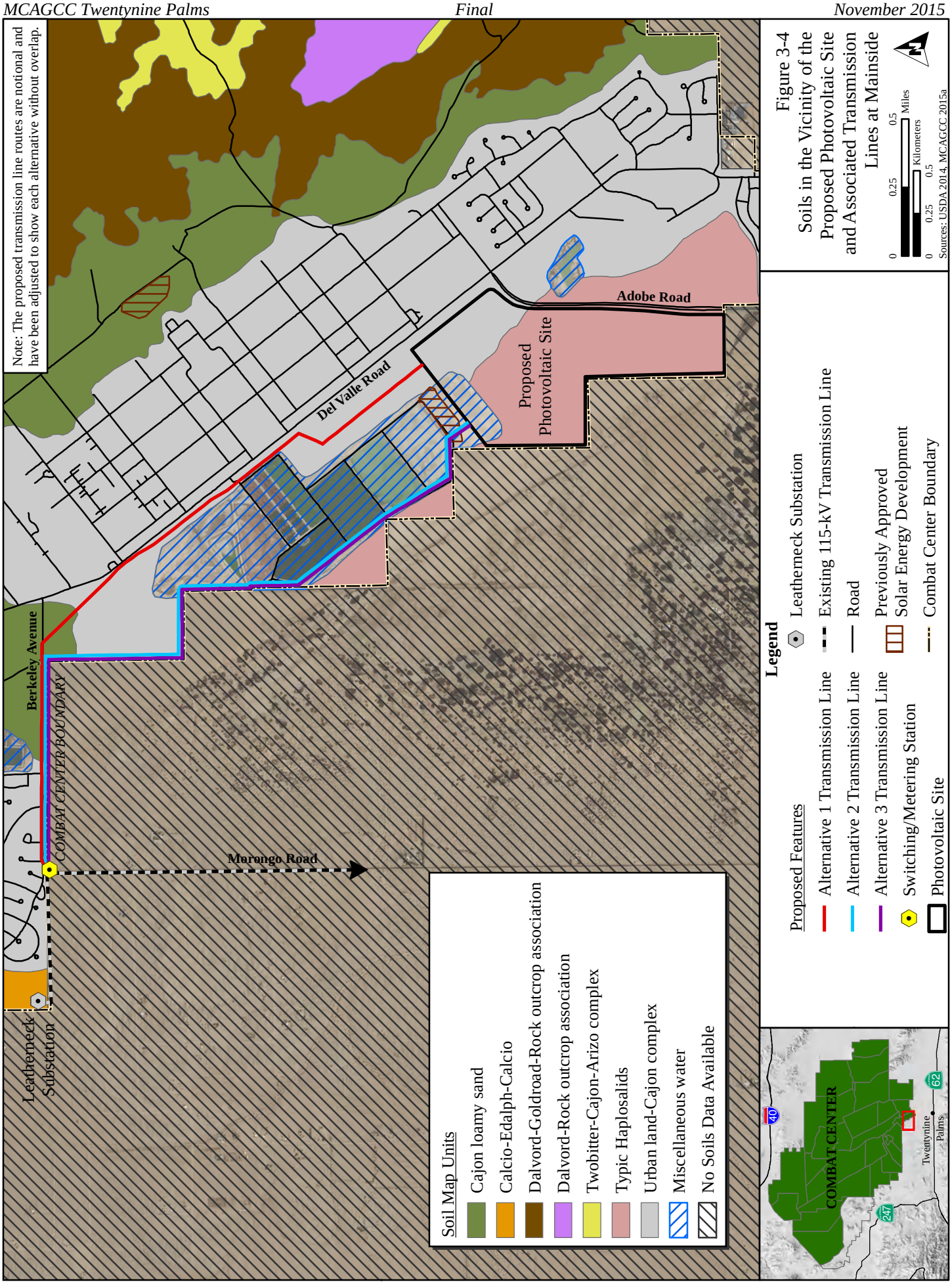

Figure 3-4
Soils in the Vicinity of the Proposed Photovoltaic Site and Associated Transmission Lines at Mainside

3.2.4 Environmental Consequences

The alteration of topography, protection of unique geological features, minimization of soil erosion, and siting of facilities away from potential geological hazards are considered when evaluating the potential impacts of an action. Generally, geological resource impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering components are incorporated into project design.

3.2.4.1 Proposed Action/Alternative 1

Topography

Construction activities would occur in relatively flat areas; therefore, while the proposed construction activities would require limited excavation, grading, and placement of fill material, no prominent topographic features would be affected or permanently altered. Areas that would be built up to ensure the PV system's substation, inverters, and associated transformers remain at least 2 ft (0.6 m) above the flood zone would be compacted and stabilized (potentially with rock rip-rap) to minimize slope failure. Soil used for this purpose would be collected from the project area, and soil and topography would be managed in a manner that would ensure there is no net reduction in the project site's ability to retain stormwater. The Proposed Action/Alternative 1 solar PV system and transmission line would not be susceptible to landslides due to the relatively level topography in the project area. Maintenance operations would not require any alterations to topography. Project facilities would be decommissioned and removed and the site would be restored to pre-construction conditions. Therefore, there would be less than significant impacts to topography with implementation of the Proposed Action/Alternative 1.

Geology

The Proposed Action/Alternative 1 would not substantially alter the geology of the project area and would not result in the loss of availability of a known mineral resource or fossils. Therefore, the Proposed Action/Alternative 1 would have less than significant impacts to geology.

Soils

The Proposed Action/Alternative 1 transmission line would cross Calcio-Edalph-Calcio, Urban land-Cajon complex, and Cajon loamy sand soils; and the proposed solar PV system would be located in Urban land-Cajon complex and typic haplosalids (playa) soils (see Figure 3-4). The soils along the transmission line alignment have slight erosion hazard and low shrink-swell potential (USDA 2014). The flat topography further lessens these modest risks. The soils of the Mesquite Dry Lake bed have poor drainage and high shrink-swell potential (USDA 2014). However, before final design of facilities, a geotechnical study would be performed by professional civil or geotechnical engineers or engineering geologists licensed in the State of California and would provide design and construction recommendations, as appropriate, to reduce potential impacts from these soil conditions. The project would incorporate the recommendations identified by the geotechnical study and the proposed facilities associated with the PV site would be designed to accommodate for the poor drainage and high shrink-swell potential of these soils. There are no prime farmland soils in the project area (USDA 2014).

Construction activities at the Combat Center are not subject to the California General Construction Permit (refer to Section 3.3, *Water Resources* for details). However, all construction activities are required to populate the Combat Center's SWPPP and adhere to the Combat Center's requirements related to storm water pollution prevention and stormwater controls. The standard erosion control measures as identified

in the Combat Center's SWPPP would reduce potential impacts to soils resulting from erosion during grading and construction activities.

Therefore, through design of the facilities to accommodate poor drainage and high shrink-swell in Mesquite Dry Lake soils and compliance with the Combat Center's SWPPP, the Proposed Action/Alternative 1 would have less than significant impacts to soils.

Geologic Hazards

The project area is located in a seismically active region with known active faults within and immediately adjacent to the project footprint (see Figure 3-3). If a seismic event were to occur along one of the fault zones, the site would experience seismic movement. However, before final design of facilities, the geotechnical study identified under soils would identify site-specific geologic conditions and potential geologic hazards. The project would incorporate the recommendations identified by the geotechnical study. Other project elements would be designed and constructed in accordance with the appropriate industry standards, including established engineering and construction practices and methods. With proper construction design, the potential for seismicity-related impacts is considered negligible. In addition, no inhabited buildings are proposed as part of the solar PV system.

Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to geological resources.

3.2.4.2 Alternative 2

Impacts under Alternative 2 would be similar to those described under the Proposed Action/Alternative 1, with the exception of impacts associated with the portion of the proposed Alternative 2 transmission line alignment that would be located along Mesquite Dry Lake. The project would incorporate the recommendations identified by the geotechnical study (as described under the Proposed Action/Alternative 1) and the portion of the transmission line alignment within this area would be designed to accommodate for the poor drainage and high shrink-swell potential of soils in Mesquite Dry Lake (see Figure 3-4). Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to geological resources.

3.2.4.3 Alternative 3

Impacts under Alternative 3 would be similar to those described under Alternative 2. The project would incorporate the recommendations identified by the geotechnical study (as described under the Proposed Action/Alternative 1) and the portion of the transmission line alignment within the playa would be designed to accommodate for the poor drainage and high shrink-swell potential of soils in Mesquite Dry Lake (see Figure 3-4). In addition, the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to geological resources.

3.2.4.4 No Action Alternative

Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center and construction activities would not occur. Baseline geological conditions, as described in Section 3.2.3, would remain unchanged. No impacts to geological resources would occur as a result of implementation of the No Action Alternative.

3.3 WATER RESOURCES

3.3.1 Definition of Resource

The water resources analysis incorporates the discussion of both surface water and groundwater. Surface water includes all lakes, ponds, rivers, streams, impoundments, and wetlands within a defined area or watershed. Surface water also includes floodplains, which are relatively flat areas adjacent to rivers, streams, watercourses, bays, or other bodies of water subject to inundations during flood events. A 100-year floodplain is an area that is subject to a 1% chance of flooding in any particular year, or, on average, once every 100 years. Groundwater resides in aquifers, areas of mostly high porosity rock substrate where water can be stored within pore spaces. Groundwater basins are recharged by rainstorms recharging the alluvial fans that extend out to the desert floor and by runoff collecting in dry lake beds.

3.3.2 Regulatory Framework

Waters of the U.S. are regulated resources and are subject to federal authority under Section 404 of the Clean Water Act (CWA). Waters of the U.S. include navigable waters, tributary streams, wetlands, and various other water bodies that are deemed to have a significant nexus to a navigable water. Areas meeting the waters of the U.S. definition are under the jurisdiction of the U.S. Army Corps of Engineers (USACE).

Section 401 of the CWA requires any applicant for a federal license or permit that may result in a discharge of a pollutant into waters of the U.S. to obtain a certification from the state in which the discharge originates or would originate. In California, the State Water Resources Control Board and Regional Water Quality Control Boards (RWQCBs) are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure dischargers meet water quality objectives.

As required by EO 11988, *Floodplain Management*, as amended on 30 January 2015, federal agencies must take action to reduce the risk of flood loss and restore and preserve the values of floodplains. To minimize the risk of damage associated with these areas, EO 11988, as amended, was issued to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practical alternative. EO 11988, as amended, outlines different requirements for federal projects located in 100-year and 500-year floodplains (i.e., that area which has a 1% or greater chance or 0.2% or greater chance, respectively, of flooding in any given year). The 30 January 2015 amendment EO 11988 requires building above the floodplain elevation. Because the proposed action would not qualify as a "critical activity" under EO 11988, compliance with EO 11988, as amended, for construction in a 500-year floodplain will not be required.

3.3.3 Affected Environment

3.3.3.1 Surface Water

The project area is located within the Southern Mojave Watershed, which is part of the Colorado River Basin Region. The Colorado River Basin covers approximately 20,312 square miles (52,609 square km), including all of Imperial County and portions of San Bernardino and Riverside counties. Surface water is minimal and normally limited to ephemeral flow. Average annual precipitation in the Combat Center area is 4.5 inches (11.3 centimeters), with 0.9 inch (2.3 centimeters) coming in the form of snow (Western Regional Climate Center 2014). The proposed project area does not contain any permanent water courses or bodies of water, but the proposed solar PV site is located within the Mesquite Dry Lake bed. Mesquite

Dry Lake is a desert playa that is an isolated, intrastate, non-navigable body of water that only has water in it after storm events; therefore, it is not considered a water of the U.S. under the jurisdiction of the USACE (USMC Western Area Counsel Office 2011).

Surface water from the project area located outside of Mesquite Dry Lake would flow into a combination of lined and unlined channels that head south toward Mesquite Dry Lake (Figure 3-5). Portions of the project area are located within the 100-year flood zone of Mesquite Dry Lake (Figure 3-5). The 100-year, 24-hour ponding elevation is estimated to be 1,764.23 ft (537.73 m) (NAVFAC Southwest 2014).

3.3.3.2 Groundwater

The Twentynine Palms Valley Groundwater Basin (also known as the Mesquite and Mainside subbasins by the USGS [Londquist and Martin 1991]) includes the water-bearing sediments below Mesquite Dry Lake and the City of Twentynine Palms. Groundwater is the primary source of potable water for the region; presently, the sole source of potable water at the Combat Center is from the Surprise Spring Groundwater Sub-basin located approximately 11 miles (18 km) northwest of the project area (MCAGCC 2012a).

Groundwater in the project area flows generally from north to south toward Mesquite Dry Lake and is part of the Mainside Sub-basin. Water level depths vary widely from 200 ft (60 m) to more than 400 ft (120 m) below ground surface. One groundwater monitoring well is located just outside of and to the north of the proposed solar PV site (see Figure 3-5). The aquifer below the project area and Mesquite Dry Lake is not used for providing drinking water and is primarily sodium sulfate in character of relatively poor quality, containing high concentrations of total dissolved solids ranging up to 5,000 parts per million (ppm). A perched water table of 3 to 10 ft (1 to 3 m) in thickness is present in the playa and eastern slope of the Mesquite Dry Lake playa.

All groundwater samples collected to date from the regional and perched water zones in the Mainside Sub-basin have shown water quality parameters exceeding the U.S. Environmental Protection Agency's (USEPA) primary and secondary drinking water standards. Groundwater production is limited in the Mainside Sub-basin for usage as a non-potable water source for equipment washing.

Nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District) utilize groundwater resources to provide potable water to their customers. The source and anticipated current and future supply for each district is provided in Table 3-4.

Table 3-4. Water Demand for Nearby Water Districts

Water District	Source of Groundwater	Current/Projected Demand (ac-ft per year)			Distance to Project (miles)
		2015	2025	2035	
Twentynine Palms Water District	Mesquite Lake Subbasin, Indian Cove Subbasin, Fortynine Palms Subbasin, and Eastern Subbasin	3,801	4,425	5,119	7
Joshua Tree Water District	Copper Mountain Basin and Joshua Tree Basin	1,877	2,022	2,177	22
Hi-Desert Water District (Yucca Valley)	Warren Valley Basin and Reche/Ames/Means Valley Basin	3,483	3,727	4,049	29

Sources: Hi-Desert Water District 2011, Joshua Tree Water District 2011, Twentynine Palms Water District 2014.

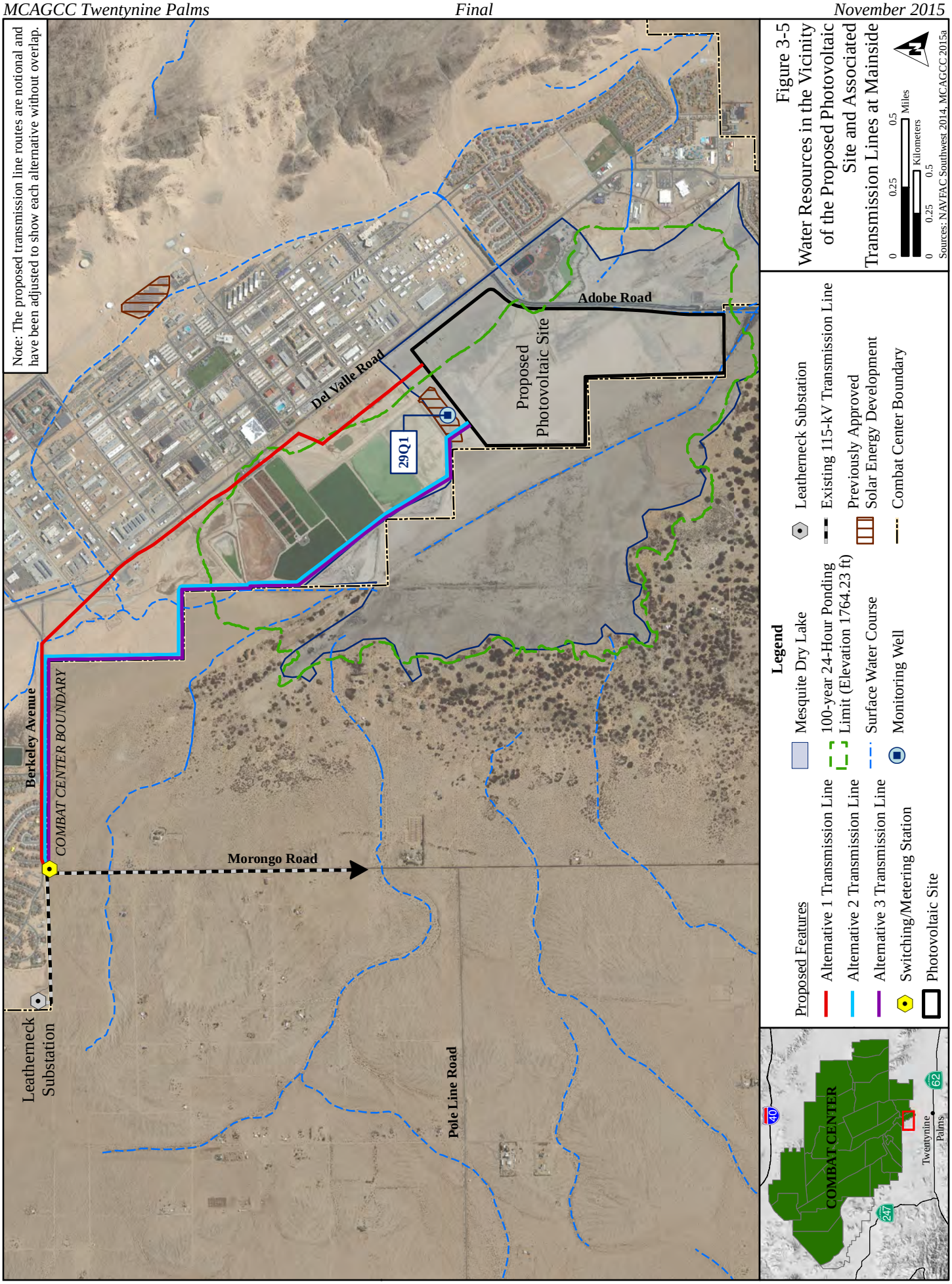

Figure 3-5
Water Resources in the Vicinity of the Proposed Photovoltaic Site and Associated Transmission Lines at Mainside

3.3.4 Environmental Consequences

Significant impacts to water resources would occur if the proposed action resulted in changes to water quality or supply, damage to unique hydrologic characteristics, increased public health hazards, or violations of established laws, regulations, or permit requirements.

3.3.4.1 Proposed Action/Alternative 1

Surface Water

Construction activities at the Combat Center are not subject to the California General Construction Permit because the Combat Center has been granted a Jurisdictional Determination by the USACE that no waters are present at the Combat Center. As a result of a Jurisdictional Determination, the Combat Center filed and was granted a Notice of Termination for all storm water permitting by the Colorado River Basin RWQCB. As described under geological resources (Section 3.2.3), all construction activities are required to populate the Combat Center's SWPPP and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. Grading activities associated with construction would temporarily (until construction is completed and the site is stabilized) increase the potential for localized erosion. However, the standard erosion control measures as identified in the Combat Center's SWPPP would reduce potential impacts resulting from erosion during grading and construction activities.

Areas that would be built up to ensure the PV system's substation, inverters, and associated transformers remain at least 2 ft (0.6 m) above the flood zone would be compacted and stabilized (potentially with rock rip-rap) to minimize slope failure. Soil used for this purpose would be collected from the project area, and soil and topography would be managed in a manner that would ensure there is no net reduction in the project site's ability to retain stormwater.

The proposed transmission line would cross surface water channels (see Figure 3-5). Replacement of existing power poles and installing new steel poles would avoid drainages to the greatest extent feasible. However, not all drainages may be avoidable and some existing poles to be removed could be located in drainages. Removal or installation of poles would have very minor and localized, if any, effects on flows or substrate within drainages. Subsequent to possible minor alterations of streambeds, restoration to approximate pre-project conditions would occur, such that there would be no substantial alteration to the bed, banks, or natural functions of these surface water features.

Portions of the Proposed Action/Alternative 1 transmission line and the proposed solar PV site are located in the 100-year flood zone associated with Mesquite Dry Lake (see Figure 3-5) and the project would be required to comply with EO 11988, as amended. As required by EO 11988, as amended, the Combat Center would give public notice that a PV farm would be partially constructed within the 100-year flood zone of Mesquite Dry Lake. EO 11988, as amended, provides that if a federal government agency proposes to conduct an activity in a floodplain, it will consider alternatives to the action located outside the floodplain. The Office of the Secretary of Defense memo *Floodplain Management on Department of Defense Installations* from 11 February 2014 also requires the services to minimize construction within designated 100-year floodplains. As discussed in Section 2.4, other alternatives located outside of the 100-year flood zone of Mesquite Dry Lake were considered but were found to not be feasible. To minimize impacts within the floodplain, all excess soils and construction debris would be removed from the floodplain and all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental regulatory requirements would be followed for the life-expectancy of the proposed solar PV site. To avoid damage to the solar PV system, the solar PV panels would be mounted on poles at a height sufficient to prevent damage during a 100-year flood event at the Mesquite Dry Lake. The depth of the

lake bed from the 100-year flood boundary to the lowest area of topography varies from 0 ft to approximately 9 ft (3 m). Project facilities would be decommissioned and removed and the 100-year flood zone would be restored to pre-construction conditions.

Therefore, implementation of the Proposed Action/Alternative 1 would have less than significant impacts to surface water resources.

Groundwater

The potential to encounter groundwater is greatest during drilling activities associated with installation of transmission line poles. Construction and operation activities associated with the Proposed Action/Alternative 1, however, are unlikely to reach depths that could affect groundwater resources because groundwater depths are greater than 200 ft (60 m) throughout most of the project area. In any case, transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater.

It is expected that the proposed project could require as much as 179 ac-ft of water for dust control during construction. Over the 2-year construction period this requirement is assumed to be 89.5 ac-ft per year. This water would likely be obtained from one or more of the three nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District) which utilize their local groundwater basins for water supply. In comparing the annual construction requirement (i.e., 89.5 ac-ft per year) to the 2015 annual demand for each district (Table 3-4), this would represent 2.3% of Twentynine Palms Water District's, 4.8% of Joshua Tree Water District's, and 2.6% of Hi-Desert Water District's annual demand. The private partner would be responsible for identifying and contracting with one or more water districts to purchase the water required for construction. Through this process, it is assumed that (1) water provided by the water district(s) can support the project's demand, (2) the individual water district(s) would only provide water within their capability, and (3) the individual water district(s) would not allow available water resources within their control to be significantly impacted. In addition, the following SCM would be implemented during construction: to reduce impacts to groundwater, reclaimed water would be used, as much as possible, for dust control needs. However, the Combat Center is the only potential source of reclaimed water in the project vicinity.

As identified in Section 2.2.1.3, the proposed project is expected to annually require approximately 5.4 ac-ft per year of water for washing, dust control, and personnel use. In comparing the annual operations and maintenance requirements to annual demand for each district (Table 3-4), this would represent approximately 0.1% of Twentynine Palms Water District's, 0.3% of Joshua Tree Water District's, and 0.1% of Hi-Desert Water District's 2025 and 2035 annual demand. It is expected that the water districts could support this demand with minimal impacts to groundwater resources in their respective districts due to the relatively small percentage of the annual water demands. The private partner would be responsible for identifying and contracting with one or more water districts to purchase the water required for annual operations and maintenance. As noted in the Joshua Tree Water District 2010 Urban Water Management Plan (Joshua Tree Water District 2011), the district anticipated it would provide 2 ac-ft per year of water to meet operational needs for the nearby Cascade Solar Plant, located approximately 4 miles (3 km) from Joshua Tree. This suggests that the Joshua Tree Water District is both capable and willing to provide water for local solar PV projects. In addition, the following SCMs would be implemented during operations and maintenance: (1) to reduce water requirements for dust control, it is expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads; and (2) to reduce impacts to groundwater, reclaimed water would be used, as much as possible, for dust control needs.

It is expected that as much as 15 ac-ft of water could be used during decommissioning from the same off-installation sources as identified for construction. The private partner would be responsible for identifying and contracting with one or more water districts to purchase the water required for decommissioning and impacts would be similar as described for construction. In addition, the following SCM would be implemented during decommissioning: to reduce impacts to groundwater, reclaimed water would be used, as much as possible, for dust control needs.

Therefore, through the private partner developer contracting with local water districts to identify sources of water and with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to groundwater resources.

3.3.4.2 Alternative 2

Impacts under Alternative 2 would be similar to those described under the Proposed Action/Alternative 1. Therefore, through the private partner developer contracting with local water districts to identify sources of water and with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to water resources.

3.3.4.3 Alternative 3

Impacts under Alternative 3 would be similar to those described under the Proposed Action/Alternative 1. In addition, the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary. Therefore, through the private partner developer contracting with local water districts to identify sources of water and with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to water resources.

3.3.4.4 No Action Alternative

Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center and construction activities would not occur. Baseline conditions of water resources, as described in Section 3.3.3, would remain unchanged. No impacts to water resources would occur as a result of implementation of the No Action Alternative.

3.4 CULTURAL RESOURCES

3.4.1 Definition of Resource

Cultural resources include buildings, structures, sites, districts, and objects eligible for or included in the National Register of Historic Places (NRHP), cultural items, Indian sacred sites, archaeological artifact collections, and archaeological resources (SECNAV Instruction 4000.35A, *Department of the Navy Cultural Resources Program*). Cultural resources can be divided into three major categories: archaeological resources, architectural resources, and traditional cultural resources.

- *Archaeological resources* are material remains of past human life that are capable of contributing to scientific or humanistic understanding of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques. Archaeological resources can include village sites, temporary camps, lithic scatters, roasting pits/hearths, milling features, rock art (both petroglyphs and pictographs), rock features, and burials.
- *Architectural resources* include real properties, sites, buildings, structures, works of engineering, industrial facilities, fortifications, and landscapes.

- *Traditional cultural resources* are tangible places or objects that are important in maintaining the cultural identity of a community or group and can include archaeological sites, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals.

3.4.2 Regulatory Framework

Federal regulations define historic properties to include prehistoric and historic sites, buildings, structures, districts, or objects on or eligible for inclusion on the NRHP, as well as artifacts, records, and remains related to such properties (NHPA, as amended [54 USC §§ 300101 *et seq.*]). Additionally, cultural resources are protected under the Archaeological Resource Protection Act (16 USC § 470aa-470mm; Public Law 96-95 and amendments), the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 USC §§ 3001-3013), and the American Indian Religious Freedom Act (Public Law 95-341; 42 USC § 1996 and 1996a). Compliance with Section 106 of the NHPA, which directs federal agencies to take into account the effect of a federal undertaking on a historic property, is outlined in the Advisory Council of Historic Preservation's regulation, *Protection of Historic Properties* (36 CFR § 800). The NHPA and associated Section 106 compliance also includes guidance for American Indian consultation regarding cultural significance of potential religious and sacred artifacts (54 USC § 302701). In addition, coordination with federally recognized American Indian tribes must occur in accordance with EO 13175, *Consultation and Coordination with Indian Tribal Governments*.

Seven federally recognized Native American groups maintain a cultural affinity with the land on which the Combat Center lies. These groups include the Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Mohave Indian Tribe, Morongo Band of Mission Indians, Aqua Caliente Band of Cahuilla Indians, Twentynine Palms Band of Mission Indians, and the San Manuel Band of Mission Indians (Federal Register 2014). Consultation with the Native American Tribes began in 1995 and one of the issues discussed is the presence of traditional cultural resources. Although none of the tribes specifically identified traditional cultural resources, they all expressed a desire to be consulted regarding any prehistoric or Native American site located on the Combat Center.

3.4.3 Affected Environment

3.4.3.1 Cultural Setting

The prehistory of the Mojave Desert, from the earliest known human occupations through the proto-historic period, is characterized by a consistent pattern of small, highly mobile and adaptable groups that engaged in seasonal migration to effectively exploit the sparse desert resources. The groups followed seasonal migration routes between the lower, drier elevations during winter and milder months, where they would have concentrated at reliable water sources, and the higher elevations in the mountains to escape the summer heat and to exploit seasonal food resources. The archeological record shows a generally increased adaptation to the desert environment through time, and increasing interregional trade, particularly between the groups clustered along the Mojave River and coastal groups. Though the toolkit varied slightly, including the introduction of the bow and arrow and pottery around 500 A.D., the basic subsistence strategies and lifeways remained relatively unchanged until Euroamerican influences began to disrupt traditional patterns (MCAGCC 2015b).

At the time of contact, the Twentynine Palms area was occupied by two linguistically related Native American groups, the Chemehuevi and the Serrano. During the early contact period, the Serrano were known to live in the Twentynine Palms area for the winter months and migrate to Bear Valley during the hot summer months. The Chemehuevi historically lived along the Colorado River and foraged as far west as Twentynine Palms for food and materials. In 1867, conflict occurred between the Chemehuevi and the

Mojave, who also inhabited the Colorado River area. Being outnumbered, the Chemehuevi left this area and a small band eventually reached the Oasis of Mara. At this time, the Serrano had temporarily abandoned the Oasis due to an outbreak of smallpox. When the Serrano returned, they peacefully co-existed with the Chemehuevi. Native Americans abandoned the Twentynine Palms area during the early 1910s (MCAGCC 2015b).

Following the 1849 California Gold Rush and into the 1930s, the Twentynine Palms area attracted miners in search of gold and silver. During the 1920s, the area became popular with returning World War I veterans after recognition that the climate of the region was excellent for recovery of lung injuries resulting from gas attacks during the war. In the 1940s, the military entered the region and established facilities at Twentynine Palms. The military has had a constant presence in the area from 1942 to the present (MCAGCC 2015b).

3.4.3.2 Proposed Project Area

A review of records maintained at the Cultural Resources Section of the NREA showed that portions of the Proposed Action had not been surveyed for cultural resources and that no cultural resources sites are known within the project boundaries. A total of ten cultural resource surveys have been conducted within 0.25 mile (400 m) of the project area in support of various projects. Generally, these surveys were small-scale surveys for pipelines, building construction, and Section 110 compliance (Figure 3-6). All of the previously surveyed areas contained evidence of substantial ground disturbance through the presence of graded and bulldozed surfaces, construction of training facilities, and natural erosion. No archaeological sites were recorded during any of these surveys (MCAGCC 2015b).

The portion of the Area of Potential Effect for the proposed photovoltaic field was historically part of the runway established by the Army Air Force in 1942. Under contract to the Army Air Force, the Twentynine Palms Air Academy established Condor Field on the Mesquite Dry Lake playa, where it conducted both combat glider and powered flight schools. Following the completion of the Army Air Force contracts in 1943, the US Navy took over the field, renaming it the Naval Auxiliary Air Station Twentynine Palms. Following the Navy's departure in 1945, the field and its infrastructure reverted to the County of San Bernardino until 1952, when the land was transferred to the DoN for the establishment of the Marine Corps Training Center, Twentynine Palms. The runway was improved several times during the 10 years since the Army Air Force had established the field, including grading at various times and the installation of perforated steel planking to provide a stable surface for landing and launching aircraft. During the years the perforated steel planking was in place, it was regularly removed, the surface re-graded, and the perforated steel planking re-laid, repairing and replacing panels in the process. In the early 1980s, the perforated steel planking was removed. Since then, the area has been used for various military activities, many of which have included ground disturbance. Flood control measures, a running track, and static displays of military armored and tracked vehicles have been installed. As a result, the entire area for the proposed photovoltaic field has been extensively graded and re-graded throughout the years (MCAGCC 2015b).

In support of the Proposed Action, the proposed solar PV site and the proposed transmission line routes were recently surveyed for archaeological resources; none were found (MCAGCC 2015b).

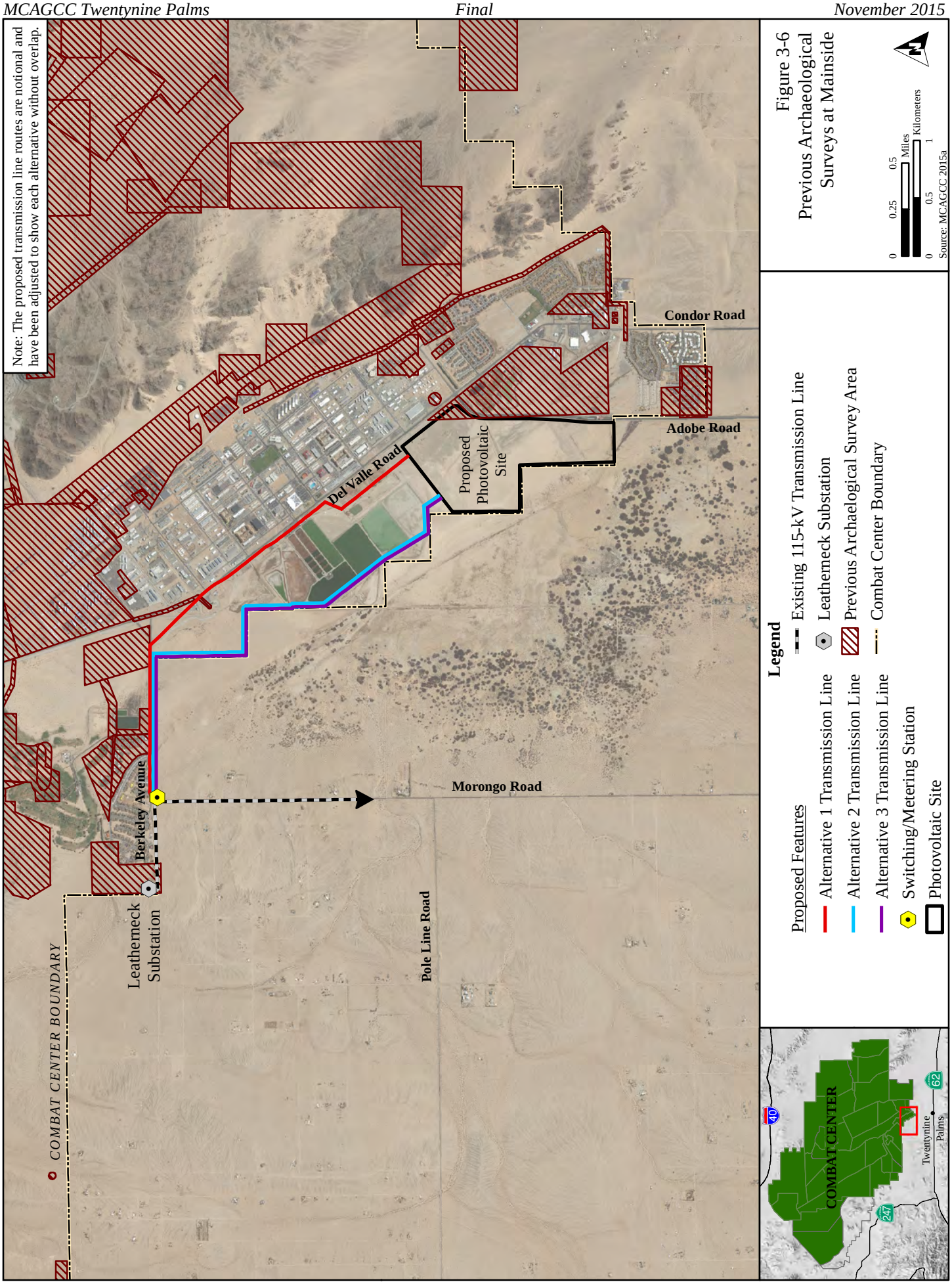

Figure 3-6
Previous Archaeological Surveys at Mainside

Much of Mainside is composed of impervious surfaces or buildings. In 2002, all extant buildings and structures on the Combat Center of the Cold War-era (1946 to 1989) were inventoried and evaluated for eligibility to the NRHP. The earliest buildings at Mainside were constructed in 1953. Because of the relatively recent age of the installation, the standard form of design, and the functions of the buildings and structures, none of the architectural resources were deemed eligible to the NRHP (Mellon 2002). As such, no architectural resources have been identified within the project area.

Based on the available records, there are no NRHP-eligible traditional cultural resources within the proposed project area.

3.4.4 Environmental Consequences

Analysis of potential impacts to cultural resources considers both direct and indirect impacts to a cultural feature. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the type and location of a proposed action and by determining the exact locations of cultural resources that could be affected. Indirect impacts are those that may result from a change in activity levels or other occurrence that is a byproduct of a proposed action, such as the effect of increased vehicular or pedestrian traffic in the vicinity of the resource.

3.4.4.1 Proposed Action/Alternative 1

No NRHP-eligible architectural or traditional cultural resources have been identified in the area of potential effect. The private partner would be responsible for preparing and implementing a Monitoring and Discovery Plan prior to construction, and archaeological monitoring would be required during all ground disturbing activities. This monitoring would be conducted solely by an archaeologist; monitoring by a tribal representative would not be required. A monitoring summary report would be completed at the end of the monitoring. If cultural resources are found during ground-disturbing activities associated with this project, federal and state laws require work to stop and the NREA Cultural Resources Manager be contacted immediately to evaluate the significance of such finds. If the project boundaries change for any reason, further archaeological work may be required and the NREA Cultural Resources Manager must be consulted. Therefore, with implementation of the proposed monitoring requirements, and having received concurrence from the SHPO (refer to Appendix E), implementation of the Proposed Action/Alternative 1 would not affect cultural resources and impacts would be less than significant.

3.4.4.2 Alternative 2

Impacts to cultural resources under Alternative 2 would be similar to those described above for the Proposed Action/Alternative 1. Therefore, with implementation of the proposed monitoring requirements described for the Proposed Action/Alternative 1, and having received concurrence from the SHPO (refer to Appendix E), implementation of Alternative 2 would not affect cultural resources and impacts would be less than significant.

3.4.4.3 Alternative 3

Impacts to cultural resources under Alternative 3 would be similar to those described above for the Proposed Action/Alternative 1. Therefore, with implementation of the proposed monitoring requirements described for the Proposed Action/Alternative 1, and having received concurrence from the SHPO (refer

to Appendix E), implementation of Alternative 3 would not affect cultural resources and impacts would be less than significant.

3.4.4.4 No Action Alternative

Under the No Action Alternative, the proposed PV, transmission line, and associated infrastructure would not be constructed, and existing conditions as described in Section 3.4.3, would remain unchanged. Therefore, there would be no impacts to cultural resources with implementation of the No Action Alternative.

3.5 AIR QUALITY

3.5.1 Definition of Resource

3.5.1.1 Criteria Pollutants

Existing air quality at a given location can be described by the concentrations of various pollutants in the atmosphere. The main pollutants of concern considered in this air quality analysis include volatile organic compounds (VOCs), ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2) particulate matter less than 10 microns in diameter but greater than 2.5 microns in diameter (PM_{10}), and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$). Although VOCs or NO_x (other than nitrogen dioxide [NO_2]) have no established ambient air quality standards, they are important as precursors to O_3 formation.

3.5.1.2 Greenhouse Gases

GHGs are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most significant of the human activities emitting GHGs is the burning of fossil fuels. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century correlating with an increase in GHG emissions from human activities.

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential, which is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential scale is standardized to CO_2, which has a value of one. For example, CH_4 has a global warming potential of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. CO_2 is the dominant gas in terms of quantities of total GHG emissions, although other GHGs have a higher global warming potential than CO_2. Total GHG emissions from a source are often reported as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emission rate representing all GHGs.

3.5.2 Regulatory Framework

3.5.2.1 Criteria Pollutants

Criteria pollutants have national and/or state ambient air quality standards. The USEPA establishes the National Ambient Air Quality Standards (NAAQS), while the California Air Resources Board (CARB) establishes the state standards, termed the California Ambient Air Quality Standards (CAAQS) (CARB 2015a). The MDAQMD has been delegated the authority to enforce the federal and state standards in the project area. Table 3-5 provides the NAAQS and CAAQS as of 2015.

Table 3-5. California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards[1]	
			Primary[2, 3]	Secondary[3,4]
O_3	1-hour	0.09 ppm (180 µg/m^3)	—	Same as primary
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as primary
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
NO_2	1-hour	0.18 ppm (339 µg/m^3)	0.10 ppm (188 µg/m^3)	—
	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary
SO_2	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (105 µg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m^3)
PM_{10}	24-hour	50 µg/m^3	150 µg/m^3	Same as primary
	Annual	20 µg/m^3	—	Same as primary
$PM_{2.5}$	24-hour	—	35 µg/m^3	Same as primary
	Annual	12 µg/m^3	15 µg/m^3	Same as primary
Lead	30-day average	1.5 µg/m^3	—	—
	Rolling 3-month average	—	0.15 µg/m^3	Same as primary
	Calendar Quarter	—	1.5 µg/m^3	Same as primary
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	No National Standards	
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	No National Standards	
Visibility Reducing Particles	8-hour	In sufficient amount to produce an extinction coefficient of 0.23 per km when the relative humidity is less than 70%. Measurement in accordance with CARB Method V.	No National Standards	

Notes: [1] Standards other than 1-hour O_3, 24-hour PM_{10}, 24-hour $PM_{2.5}$, and those based on annual averages cannot be exceeded more than once a year.

[2] Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

[3] Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the USEPA.

[4] Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse pollutant effects.

µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; ppm = parts per million.

Source: CARB 2015a.

Section 176(c) of the Clean Air Act (CAA), as articulated in the USEPA General Conformity Rule, states that a federal agency cannot issue a permit or support an activity unless the agency determines that the action would conform to the most recent USEPA-approved State Implementation Plan (SIP). This means that projects using federal funds or requiring federal approval in nonattainment or maintenance areas must not: (1) cause or contribute to any new violation of a NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay the timely attainment of any standard, interim emission reduction, or other milestone. Certain actions are exempt from conformity determinations if the projected emission rates would be less than specified emission rate thresholds, known as *de minimis* thresholds. The applicable *de minimis* levels for the project area are listed in Table 3-6.

Table 3-6. Applicable Criteria Pollutant *de minimis* Levels (tons/year)

VOCs[1]	NO_x[1]	CO	SO_2	PM_{10}[1]	$PM_{2.5}$
25	25	N/A	N/A	100	N/A

Notes: [1] The Mojave Desert Air Basin (MDAB) is a severe nonattainment area for the 8-hour O_3 NAAQS (VOCs and NO_x are precursors to the formation of O_3) and is a moderate nonattainment area for the PM_{10} NAAQS.
N/A = not applicable because the MDAB is currently in attainment of the NAAQS for these criteria pollutants.
Source: USEPA 2015a.

Presently, the Mojave Desert Air Basin (MDAB) attains the NAAQS for all criteria pollutants except O_3 and PM_{10}. The portions of the MDAB that encompass the project area are rated as "severe" O_3 and "moderate" PM_{10} nonattainment areas (USEPA 2015a). The southwestern portion of San Bernardino County located within the South Coast Air Basin (in the Los Angeles and San Bernardino urban areas) is an "extreme" O_3 nonattainment area. Per 42 USC § 7511d, if an area in extreme or severe ozone nonattainment fails to attain the NAAQS by the planned attainment date, then each major stationary source of VOCs located within the area shall pay a fee to the state for each calendar year until the area is redesignated as an attainment area for ozone. CARB also designates areas of the state that are in attainment or nonattainment of the CAAQS. An area is in nonattainment for a pollutant if its CAAQS have been exceeded more than once in 3 years. Presently, the MDAB attains the CAAQS for all criteria pollutants except O_3, PM_{10}, and $PM_{2.5}$ (CARB 2015b).

3.5.2.2 Greenhouse Gases

Federal agencies are addressing emissions of GHGs by mandating GHG reductions in federal laws and EOs, most recently in EO 13693 (*Planning for Federal Sustainability in the Next Decade*) (EO 13693 superseded EO 13423 *[Strengthening Federal Environment, Energy, and Transportation Management]* and EO 13514 [E*nergy Efficient Standby Power Devices]).* In 2009 the USEPA signed GHG Endangerment Findings under Section 202(a) of the CAA, stating that six "key" GHGs are a threat to public health and welfare (CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). Since then, the USEPA has been creating standards and regulations for controlling GHG emissions from passenger vehicles. Additionally, since 2012 the USEPA has issued proposals and updated regulations to reduce carbon emissions from new and existing power plants, landfills, and oil and natural gas facilities. Despite these efforts, there are no promulgated federal regulations to date limiting GHG emissions. In December of 2014 the CEQ issued revised draft guidance for Federal agencies, to provide guidance on when and how to consider the effects of GHG emissions and climate change in their projects (CEQ 2014).

Several states have passed GHG related laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 (Assembly Bill 32) directs the State of

California to reduce statewide GHG emissions to 1990 levels by the year 2020. EO S-20-06 further directs state agencies to begin implementing Assembly Bill 32, including the recommendations made by the state's Climate Action Team. Activities taken thus far to implement Assembly Bill 32 include mandatory GHG reporting and a cap-and-trade system for major GHG-emitting sources (CARB 2015c).

In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with goals set by EO 13693 and the Energy Policy Act of 2005, the DoN has implemented a number of renewable energy projects. The types of projects currently in operation within military installations include thermal and PV solar energy systems, geothermal power plants, and wind energy generators.

The potential effects of GHG emissions are by nature global and cumulative, and it is impractical to attribute climate change to individual projects. Therefore, the impact of GHG emissions associated with this project is discussed in the context of cumulative impacts in Section 4.2.5 of this EA.

3.5.3 Affected Environment

In partnership with the MDAQMD, the Natural Resources Environmental Affairs at the Combat Center has operated an air monitoring program at the Combat Center since 1996. Currently, two stations sample for PM_{10} within the southern region of the Combat Center. The Mainside area of the Combat Center also samples for gaseous pollutants. The purpose of the program is to characterize air quality trends and to address state and regional air monitoring initiatives. Table 3-7 summarizes the 2003-2009 maximum ambient pollutant data monitored at the Mainside monitoring station, the years for which data is available and is considered to be an appropriate representation of ambient air quality (MCAGCC 2014b). The $PM_{2.5}$ data was obtained from the MDAQMD Victorville station for the same years. These data show that other than O_3 and PM_{10}, the ambient air quality concentrations at this location are well below CAAQS and NAAQS values.

Table 3-7. Maximum Pollutant Concentrations Measured at the Mainside Monitoring Station

Pollutant	Averaging Period	National Standard	State Standard	Highest Monitored Concentration*				
				2003	2004	2005	2008	2009
O_3 (ppm)	1-hour	N/A	0.09	0.111	0.095	0.106	0.093	0.087
	8-hour	0.075	0.07	**0.076**	**0.080**	**0.081**	**0.077**	**0.073**
CO (ppm)	1-hour	35	20	1.0	0.7	0.7	1.2	3.6
	8-hour	9	9	0.8	0.3	0.6	1.0	2.4
NO_2 (ppm)	1-hour	0.10	0.18	0.028	0.058	0.025	0.025	0.03
	Annual	0.053	0.03	0.005	0.004	0.004	0.003	0.004
SO_2 (ppm)	1-hour	0.075	0.25	0.020	0.005	0.006	0.010	0.011
	24-hour	N/A	0.04	0.003	0.002	0.002	0.009	0.007
	Annual	N/A	N/A	0.001	0.000	0.001	0.002	0.002
PM_{10} ($\mu g/m^3$)	24-hour	150	50	N/A	N/A	N/A	118	TBD
	Annual	N/A	20	22	18	17	25	TBD
$PM_{2.5}$ ($\mu g/m^3$)	24-hour	35	N/A	28	34	27	17	20
	Annual	15	12		11	10	N/A	9

Notes: *Exceedances of the standards are **bolded**. Data for calendar year 2008 inclusive to 30 September 2008.
N/A = not applicable; TBD = to be determined.
Source: Naval Facilities Engineering Service Center (2009), except $PM_{2.5}$ data collected by the MDAQMD at the Victorville station (MCAGCC 2014b).

3.5.4 Environmental Consequences

This resource section focuses on groups of activities that have the potential to result in an impact to the ambient air quality. The analysis was separated by the three project phases as discussed in Chapter 2: construction, operation/maintenance, and decommissioning. Types of activities that could affect air quality include operation of construction equipment and vehicles, worker vehicle trips, and earth moving activities.

Approach to Analysis

The air quality analysis estimated the magnitude of emissions that would occur from proposed construction and decommissioning activities. Construction related activities would include clearing vegetation, grading to prepare the site, trenching for utilities, pole mounting and/or concrete footing for the PV system installation, and construction/installation of the substations, switching/metering stations, transmission poles, and solar PV panels. Although manufacturing of solar PV cells or panels is not part of this proposed action and would occur off-installation, manufacturing of solar PV cells requires potentially toxic heavy metals such as lead, mercury, and cadmium. It even produces GHGs, such as CO_2, that contribute to global climate change. However, existing research suggests that solar PV systems compared with conventional fossil fuel-burning power plants significantly reduces air pollution (Intergovernmental Panel on Climate Change 2012).

Operational emissions from maintenance activities, as described in Section 2.2.1.3, would be minor and infrequent. Emissions would be generated from operational activities such as the use of vehicles and equipment with combustive engines, including water tank trucks to deliver water to the site, and generation of fugitive dust when driving vehicles on unpaved surfaces within and around the solar PV installation to perform periodic washing of panels and vegetation removal.

Emissions Evaluation Methodology

Air quality impacts from construction activities proposed under each action alternative would primarily occur from combustive emissions due to the use of fossil fuel-powered equipment and fugitive dust emissions (PM_{10} and $PM_{2.5}$) from the operation of equipment on exposed soil. Air emissions were estimated using the California Emissions Estimator Model (CalEEMod), which is the current comprehensive tool for quantifying air quality impacts from land use projects throughout California. The model was developed in collaboration with the air districts of California and includes default data (e.g., emission factors, trip lengths, meteorology, source inventory) that have been provided by the various California air districts to account for local requirements and conditions (California Air Pollution Control Officers Association 2015). For this analysis, default data was overridden in the model by project-specific data (as provided in Chapter 2) when available. Assumptions were made regarding the total number of days each piece of equipment would be used and the number of hours per day each type of equipment would be used. Assumptions and model inputs are located within the modeling calculations in Appendix C, *Record of Non-Applicability and Air Quality Calculations*.

For the purposes of this air quality analysis, and for air pollutants designated as nonattainment with the NAAQS (and therefore subject to CAA General Conformity requirements), if the estimated total of direct and indirect emissions caused by a project alternative exceeds a conformity *de minimis* threshold requiring a conformity determination in the MDAB project region (25 tons per year of VOCs or NO_x or 100 tons per year of PM_{10}), further analysis and a formal CAA Conformity Determination would be conducted to determine whether impacts were significant. In such cases, if emissions conform to the approved SIP, then proposed impacts would be determined to be less than significant. For those air

pollutants in the MDAB that are in attainment of the NAAQS (so the General Conformity requirements and thresholds do not apply), estimated emissions were compared to the New Source Review thresholds of 250 tons per year.

3.5.4.1 Proposed Action/Alternative 1

Construction, Operation, and Decommissioning Activities

Implementation of the Proposed Action/Alternative 1 would result in the construction of an up to 57 MW solar PV system on flat or sloped grades. Soil disturbance would include multiple augured holes for pole mounting and/or concrete footings. In addition, soil could be built up, compacted, and stabilized (potentially with rock rip-rap) in a relatively small area to ensure the PV system's substation, inverters, and associated transformers remain at least 2 ft (0.6 m) above the flood zone.

For modeling purposes, it was assumed that the entire 241 ac (97 ha) site would be disturbed and prepared for placement of the solar PV system and associated equipment. Grading would be required to level the site where needed and for activities such as trench digging and foundation footing placement, but any cut and fill would remain on site. Additionally, construction activities include the installation of a new 2.6 mile (4.2 km) transmission line, requiring replacement of every other existing power pole with an 80 ft (24 m) tall steel pole with a concrete base. Construction activities were assumed to take approximately 2 years to complete (2016-2017). Decommissioning activities are expected to occur over the course of 2 months and were assumed to occur in 2053.

Operational air emissions refer to air emissions that may occur after the solar panels have been installed. Operational air emissions would primarily result from the use of employee vehicles traveling to the project site for maintenance and repair activities, water tank trucks being driven to and from the site for water deliveries (assumed to be 60 miles [97 km] round-trip), and from travel on unpaved roads and surfaces. Routine maintenance and inspections would typically require one to two vehicles per event and would generate very minor emissions. Dust suppression methods would continue to be employed as necessary.

Table 3-8 presents a summary of the annual emissions associated with construction, operation, and decommissioning activities at the Combat Center under the Proposed Action/Alternative 1. Emission calculations are provided in Appendix C, *Record of Non-Applicability and Air Quality Calculations*. Since the potential emissions are from construction and decommissioning activities in differing years, they are not additive. The yearly emissions estimated to be produced during the operational phase of the project are a conservative, or high, estimate due to the limitations of the model for estimating emissions from a utility land use.

As shown in Table 3-8, annual project emissions would be below *de minimis* thresholds and New Source Review thresholds of 250 tons per year, and would not trigger a formal Conformity Determination under the CAA General Conformity Rule.

Table 3-8. Proposed Action/Alternative 1 – Annual Construction, Operation, and Decommissioning Emissions at the Combat Center with Evaluation of Conformity

Emission Source	Emissions (tons/year)					
	VOCs	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Proposed Action/Alternative 1 - Construction						
Year - 2016	0.26	1.58	7.89	0.02	0.72	0.29
Year - 2017	0.30	1.72	9.53	0.02	0.37	0.13
Proposed Action/Alternative 1 - Operation						
Yearly Emissions	0.31	0.10	0.22	0.0006	0.02	0.009
Proposed Action/Alternative 1 - Decommissioning						
Year – 2053	0.006	0.03	0.32	0.0006	0.02	0.005
Conformity *de minimis* Limits	25	25	N/A	N/A	100	N/A
Exceeds Conformity *de minimis* Limits?	No	No	No	No	No	No

Note: N/A = not applicable.

Ground disturbance during construction could result in the release of dust, which may carry spores from the fungus that causes Valley Fever (University of Arizona Valley Fever Center for Excellence 2010a, 2010b, 2015). Refer to the *Public Health and Safety/Protection of Children* subsection at the beginning of Chapter 3 for additional discussion related to Valley Fever and to Table 2-1 for a detailed list of all proposed measures that would be implemented as part of the Proposed Action to avoid and minimize the generation of, and exposure to, dust that may contain the fungus that causes Valley Fever. The private partner would also ensure that the project complies with MDAQMD Rule 403.2, *Fugitive Dust Control for the Mojave Desert Planning Area*.

In addition to the dust control measures provided in Table 2-1, best management practices would be followed during the construction, operation, and decommissioning activities to reduce air emissions from combustive engines. Proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within the design standards of all construction equipment. Construction vehicle engines (non-road diesel engines) would conform to USEPA Tier 4 emission standards, when applicable.

Hazardous Air Pollutants

The USEPA has listed 188 substances that are regulated under Section 112 of the CAA, and the state of California has identified additional substances that are regulated under state and local air toxics rule. Emission factors for most Hazardous Air Pollutants (HAPs) from combustion sources are roughly three or more orders of magnitude lower than emission factors for criteria pollutants. Trace amounts of HAPs may be emitted from sources during the construction/decommissioning and operation of the proposed solar PV project; however, the amounts that would be emitted would be small in comparison with the emissions of criteria pollutants. Emissions of HAPs would also be subject to dispersion due to wind mixing and other dissipation factors; therefore, no significant impacts would occur.

General Conformity Applicability Analysis

The estimated emissions associated with the Proposed Action would be below the *de minimis* threshold levels for General Conformity Rule requirements. Therefore, the Proposed Action would conform to the MDAB SIP and would not trigger a formal Conformity Determination under Section 176(c) of the CAA. The USMC has prepared a Record of Non-Applicability (Appendix C) in accordance with the CAA General Conformity Rule.

On a region-wide scale, the use of solar PV panels would have beneficial air quality impacts because fossil fuels would not be used for the necessary electricity generation, resulting in fewer GHG and particulate matter emissions. Providing solar energy to the Combat Center and the region would have long-term direct and indirect benefits to air quality in the MDAB. These potential long-term beneficial impacts would off-set the minor air quality emissions generated as a result of construction, operation, and decommissioning of the solar PV system. From an air quality perspective, the proposed solar PV site benefits would off-set and exceed any temporary impacts to air quality within the region.

Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to air quality.

3.5.4.2 Alternative 2

Alternative 2 consists of all of the actions proposed under the Proposed Action/Alternative 1 with the exception of the location for the new transmission line. The new transmission line portion of Alternative 2 is 2.9 miles (4.7 km) long, compared to 2.6 miles (42 km) under the Proposed Action/Alternative 1. For air quality modeling purposes, this nominal difference in the proposed transmission line length would not cause an appreciable difference in air quality emissions. Implementation of Alternative 2 would result in similar, albeit only slightly larger, air quality emissions as described under the Proposed Action/Alternative 1. Therefore, with implementation of the proposed SCMs, Alternative 2 would have less than significant impacts to air quality.

3.5.4.3 Alternative 3

Alternative 3 consists of all of the actions proposed under the Proposed Action/Alternative 1 with the exception of the location for the new transmission line. The new transmission line portion of Alternative 3 is 2.9 miles (4.7 km) long, compared to 2.6 miles (42 km) under the Proposed Action/Alternative 1. For air quality modeling purposes this nominal difference in the proposed transmission line length would not cause an appreciable difference in air quality emissions. Implementation of Alternative 3 would result in similar, albeit only slightly larger, air quality emissions as described under the Proposed Action/Alternative 1. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to air quality.

3.5.4.4 No Action Alternative

Under the No Action Alternative, the DoN would not enter into an agreement with a private partner to construct and operate a solar PV system at the Combat Center. The No Action Alternative represents the status quo. Under the No Action Alternative, the emissions levels would remain constant for those emission sources that are not affected by other federal, state, county, local, DoD, DoN, USMC, or Combat Center requirements to reduce air emissions. As a result, no net emission increases would result from implementation of the No Action Alternative. With no net emission increases proposed, the No Action Alternative is exempt from the General Conformity Rule. There would be no impacts to air quality.

3.6 UTILITIES

3.6.1 Definition of Resource

This section focuses on utilities within the vicinity of the project site, including stormwater drainage, electricity, natural gas, wastewater, and potable and non-potable water.

3.6.2 Existing Utility Framework

3.6.2.1 Stormwater Drainage

Although rainfall is infrequent, danger of flash flooding exists as rain events are typically of high intensity over short durations. Currently, stormwater runoff at the Combat Center is conveyed in open drainage swales. Runoff flows westward via a combination of lined and unlined drainage channels toward retention basins at Mesquite Dry Lake (MCAGCC 2009).

3.6.2.2 Electricity

In 2003, a 7.2-MW cogeneration power plant was installed at the Combat Center. This natural-gas fired turbine generates 71% of the electricity needs of the Combat Center. In addition to the cogeneration plant, 2.6 MW of solar PV power has been installed on the Combat Center, consisting of a 1.1-MW PV array plus 1.5 MW installed on the rooftops of vehicle shade structures. To increase on-site power generation, the Combat Center recently constructed a second cogeneration power plant consisting of two 4.6-MW gas-fired turbines. Combined, these power sources provide the vast majority of electricity used by the Combat Center.

3.6.2.3 Natural Gas

Natural gas is delivered to the Combat Center at the main meter/regulator station at Del Valle Road and Cottontail Road. The delivery source is a high-pressure main owned and operated by Southern California Gas Company. Natural gas is then distributed throughout Mainside. The existing natural gas system has adequate capacity to effectively serve existing base facilities (MCAGCC 2009).

3.6.2.4 Wastewater

Mainside is serviced by one wastewater treatment plant that is located west of Del Valle Road at Seventh Street. The treatment plant headworks has a maximum capacity of 7.5 million gallons (28 million liters) per day, with an average flow rate of 1.0 million gallons (3.8 million liters) per day. The Mainside plant consists of the enclosed headworks building which is negatively pressurized so odors from untreated influent can be treated using a soil bio-filter. The headworks building is equipped with a bar screen auger system. Influent flow is measured in a 9-inch (23-centimeter) Plastifab parshall flume located just outside and downstream of the headworks building (USMC 2013b).

From the headworks, the influent is channeled to an integrated pond system with a solids digestion section (fermentation pit) that is constructed within the eastern footprint of Pond 1. The balance of the integrated pond system aerated pond, outside the fermentation pit footprint, begins secondary biological treatment processes (USMC 2013b).

The Secondary Treatment Facilities include inter-pond piping, flow controls and flow pattern, two parallel wetlands built within the footprint of existing Ponds 2 and 3, and a dedicated secondary treated effluent pump station and disinfection system (USMC 2013b).

Secondary treated reclaimed water is pumped to Ocotillo Pond to be reused at the golf course (USMC 2013b).

3.6.2.5 Potable Water

All potable water consumed at the Combat Center is produced by an existing groundwater well field drawn from the Surprise Spring Aquifer. The installation has a total of 11 production wells that have a peak day supply of 7 million gallons (27 million liters); the current daily potable water consumption at the installation is approximately 1.8 million gallons (7.9 million liters) per day. After disinfection in the

equalizer tanks, the water is allowed to continue flowing by gravity to the Camp Wilson reservoir and to the above-ground steel storage reservoirs at Mainside (approximate elevation of 1,955 ft [596 m]) (USMC 2013b).

3.6.3 Affected Environment

3.6.3.1 Stormwater Drainage

A stormwater line is located under a portion of the Alternative 1 transmission line route, southwest of Tenth Street.

3.6.3.2 Electricity

Existing electrical infrastructure, generally consisting of a 34.5-kV distribution line and a 12.47-kV distribution line on 55-ft (17-m) tall wooden poles, is located within the northeast portion of the proposed solar PV site and along the entirety of the proposed transmission line under Alternative 1. A second transmission line is also located along a portion of the Combat Center's southern boundary, including the entirety of Berkeley Avenue. East of Westside Road, the second line is on the north side of Berkeley Avenue; west of Westside Road, the second line is on the south side of Berkeley Avenue. A portion of these two transmission lines along Berkeley Avenue are located underground.

A third, off-installation transmission line is also located along the portion of Berkeley Avenue and the Combat Center's boundary that is west of Morongo Road. This transmission line is owned by SCE.

3.6.3.3 Natural Gas

A natural gas line is located along the entirety of Del Valle Drive, Berkeley Avenue, and a portion of the proposed transmission line would run parallel to the gas line. The precise location would be confirmed before construction. This gas line also connects to the wastewater treatment plant along Del Valle Drive.

3.6.3.4 Wastewater

The Alternative 1 transmission line would follow existing electricity lines and therefore would pass over a portion of the wastewater treatment plant and associated main wastewater treatment lines. The wastewater treatment lines nearest to the proposed PV area are two main lines that parallel Del Valle Drive, approximately 180 ft (55 m) from the northwest edge of the proposed PV area. A main wastewater line also runs along the proposed transmission lines parallel to Berkeley Avenue. East of Mesquite Springs Road, this main is south of the Berkeley Avenue; west of the Mesquite Springs Road, this main is underneath Berkeley Avenue. Two other wastewater mains also connect to, or cross underneath, the Berkeley Avenue main at Morongo Road and west of Mesquite Springs Road. A wastewater pump is located south of Berkeley Avenue at Westside Road.

3.6.3.5 Potable Water

Main water lines run parallel and adjacent to Adobe Road and are also located within the PV area, generally running parallel to Del Valle Drive, located approximately 450 ft (137 m) southwest of the proposed northeastern PV boundary. This line turns northeast and connects with other lines adjacent and parallel to Del Valle Drive at First Street. Water main lines are also located adjacent to several portions of the Alternative 1 transmission line along or near Del Valle Road, including the southwest side of the track field and baseball diamonds near Third Street, the wastewater treatment plant, and infrastructure near Tenth Street. The water main also runs along and crosses underneath the existing and proposed transmission lines for most of the length of Berkeley Avenue.

3.6.4 Environmental Consequences

This section evaluates the potential impacts to utilities associated with implementation of the action alternatives. Impacts to utilities would occur if implementation of an action alternative would result in the use of a substantial proportion of the remaining utility system capacity, reach or exceed the current capacity of the utility system, or require development of facilities and utility sources beyond those existing or currently planned.

3.6.4.1 Proposed Action/Alternative 1

The Proposed Action would be sited within a reasonable proximity to interconnection facilities, and the energy generated by the Proposed Action would contribute to the SECNAV's initiative to generate power that would go into the civilian grid under Model 2 (refer to Section 1.1.1, *Secretary of the Navy Renewable Energy Goals and Strategies*), a beneficial impact to utilities.

To avoid design and construction conflicts with the Combat Center's internal utility network, a utility investigation would be conducted to obtain the exact depth and location of underground utilities (i.e., natural gas lines, wastewater lines, potable and non-potable water lines). As described in Section 2.2.1, *Proposed Action/Alternative 1,* the implementation of Alternative 1 would require replacing every other existing, wooden power pole with a taller pole. Areas at the front of the wastewater detention ponds, parallel to Del Valle Road, would require special consideration to avoid undermining the detention pond berms during any pole replacement activities. This would not be a concern during decommissioning, since the poles would be cut above the existing transmission lines and would not require additional ground disturbance. Similarly, construction activities would also require special consideration of the existing overhead line at the proposed solar PV site, and appropriately low construction equipment and safety measures would be utilized as needed. To avoid interrupting Combat Center operations, work along the entire transmission line would be completed while the existing transmission lines are operational, or "hot."

As described in Section 2.2.1, *Proposed Action/Alternative 1*, the private partner would be responsible for obtaining the necessary water. It is expected that this water would come from one or more of the three nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District); the private partner would also be responsible for shipping the water to the project site via truck. As such, the Proposed Action/Alternative 1 would have no impact on the Combat Center's water utilities, and it is assumed that the nearby water districts would only provide water if it were available for use without causing a significant impact. For additional information on the nearby water districts, refer to Section 3.3, *Water Resources*.

Because solar energy presents a variable or intermittent load beyond the control of its producer, it must be managed and coordinated on the civilian grid according to its availability. Interconnections to the civilian grid are handled by the CAISO for the major California utilities including SCE (the local electrical utility). The conditions for application established by CAISO, SCE, Federal Energy Regulatory Commission, and other entities serve to maintain grid stability and public safety. The private partner would be responsible for adhering to these established processes, which include an application for interconnection, a systems impact study, and a facility study. Additionally, upgrades to off-installation utility facilities could require permitting by the California Public Utility Commission and could require review under the California Environmental Quality Act. Off-installation utility upgrades required by the local utility for carrying the PV power would be determined through the interconnection studies, which would be the responsibility of the private partner in coordination with SCE or CAISO.

Therefore, for the reasons described above, and with the proposed avoidance and impact minimization measures, implementation of the Proposed Action would have a beneficial impact to renewable energy generation and would not result in the use of a substantial proportion of the remaining utility system capacity, reach or exceed the current capacity of the utility system, or require development of facilities and utility sources beyond those existing or currently planned. Therefore, with implementation of the proposed SCMs, the Proposed Action/Alternative 1 would have less than significant impacts to utilities.

3.6.4.2 Alternative 2

Impacts to utilities under Alternative 2 would be similar but less than those described for the Proposed Action/Alternative 1, since the proposed transmission line under Alternative 2 would be located away from existing utilities (i.e., natural gas lines, wastewater lines, and potable and non-potable water lines) for the majority of the proposed transmission route. This would also reduce the amount of construction work involving operational, or "hot," power transmission lines. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to utilities.

3.6.4.3 Alternative 3

Impacts to utilities under Alternative 3 would be similar but less than those described for the Proposed Action/Alternative 1, since the proposed transmission line under Alternative 3 would be located away from existing utilities (i.e., natural gas lines, wastewater lines, and potable and non-potable water lines) for the majority of the proposed transmission route. Alternative 3 would also eliminate the need for construction work involving operational, or "hot," power transmission lines. Therefore, with implementation of the proposed SCMs, Alternative 3 would have less than significant impacts to utilities.

3.6.4.4 No Action Alternative

Under the No Action Alternative, the proposed PV, transmission line, and associated infrastructure would not be constructed, and existing conditions as described in Section 3.6.3, *Affected Environment*, would remain unchanged. Therefore, there would be no impacts to utilities with implementation of the No Action Alternative.

CHAPTER 4
CUMULATIVE IMPACT ANALYSIS

The analysis of cumulative impacts (or cumulative effects) follows the objectives of NEPA and CEQ regulations (40 CFR Parts 1500-1508) that provide the implementing procedures for NEPA. The CEQ regulations define cumulative impacts as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR § 1508.7)

The CEQ also provides guidance on cumulative impacts analysis in Considering Cumulative Effects under NEPA (CEQ 1997). Noting that environmental impacts result from a diversity of sources and processes, the CEQ guidance observes that "no universally accepted framework for cumulative effects analysis exists," while noting that certain general principles have gained acceptance. One such principle provides that "cumulative effects analysis should be conducted within the context of resource, ecosystem, and community thresholds—levels of stress beyond which the desired condition degrades." Thus, "each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters." Therefore, cumulative effects analysis normally would encompass geographic boundaries beyond the immediate area of the Proposed Action, and a time frame including past actions and foreseeable actions, to capture these additional effects. Bounding the cumulative effects analysis is a complex undertaking, appropriately limited by practical considerations. Thus, CEQ guidelines observe, "[i]t is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful."

Boundaries, or the region of interest (ROI), for analyses of cumulative impacts in this EA vary. Delineation of the ROI is based upon proximity to the proposed action and which resources are affected. For example, for air quality, the potentially affected air basin is the appropriate boundary for assessment of cumulative impacts from releases of pollutants into the atmosphere. The cumulative impacts analysis focuses on projects that directly overlap with the proposed alternatives (i.e., occur in similar locations and potentially impact similar resources).

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

Identifiable effects of other past, present, and reasonably foreseeable future actions are analyzed and evaluated to the extent they may be additive to impacts of the Proposed Action. As part of the evaluation of cumulative impacts, a review of other projects in the vicinity of the action alternatives was conducted. Projects that were older than 5 years have been considered within the baseline of this analysis (refer to Chapter 3) and are not considered below. Projects that are considered reasonably foreseeable future actions are projects that would occur by or in 2020. Projects that would occur after 2020 are highly uncertain and thus do not meet the criteria of being reasonably foreseeable. Other testing and training activities at the Combat Center that do not have the potential to interact cumulatively with the Proposed Action are not addressed in this EA.

4.1.1 Past Projects

4.1.1.1 Permanent Facilities Bed-Down of Increased End-Strength

An EA was completed in September 2009 to evaluate the environmental impacts associated with construction of permanent facilities and infrastructure at the Combat Center to support the USMC's Grow the Force Initiative (USMC 2009). The development footprint for this project is located within the Mainside area of the Combat Center, and would consist of 43 Military Construction (MILCON) projects. Notable examples of the Grow the Force MILCON projects include:

- P-924 MAGTFTC Simulation Training Facility
- P-182 Battalion Operations Center
- P-990 Range Control Facility
- P-954 MAGTFTC Operations Center
- P-923 Electrical and Communications Maintenance Storage
- P-109 Tactical Vehicle Wash Platform
- P-156 Construction Maintenance and Storage Hangar (Marine Unmanned Aerial Vehicle Squadron)
- P-168 SELF Utilities Installation
- P-155 Squadron Headquarters and Maintenance Complex (Marine Unmanned Aerial Vehicle Squadron)
- P-160 Expeditionary Training Support
- P-504 Consolidated Community Support Facility

Based on the results of the analysis, it was determined that there would be no significant impacts to the environment with implementation of the proposed action. A FONSI was signed for the Permanent Facilities Beddown of Increased End-Strength on 29 September 2009.

4.1.1.2 Proposed Changes to the Permanent Facilities Bed-down and Infrastructure Project

A Supplemental EA was completed in August 2014 to evaluate the environmental impacts associated with changes to the footprint and scope of some of the projects within the 2009 EA (P-221, P-504, and P-159) as well as the addition of two new projects (P-930 and P-558). The proposed action would occur primarily in two areas of the Combat Center: Mainside and the Camp Wilson/SELF. Based on the results of the analysis, it was determined that there would be no significant impacts to the environment with implementation of the proposed action (USMC 2014a). A FONSI was signed for the Proposed Changes to the Permanent Facilities Bed-down and Infrastructure Project on 22 August 2014 (USMC 2014b).

4.1.1.3 Aerial Maneuver Zones (AMZs) for MV-22 and Rotary-Wing Training

An EA was prepared to evaluate the potential environmental impacts associated with the use of AMZs by MV-22 Osprey tilt-rotor (MV-22) aircraft and rotary-wing aircraft at the Combat Center (USMC 2010b). Specifically, the proposed action would use five different types of AMZs to integrate the MV-22 airframe into the existing rotary-wing tactical and ground training exercises. The EA identifies the environmental consequences of establishing 48 AMZs (Alternative 1) and 73 AMZs (Alternative 2) at various locations within the Combat Center. These AMZs are distributed throughout the Combat Center and are located to the north of the proposed PV site. Based on the results of the analysis, it was determined that there would be no significant impacts to the environment with implementation of the proposed action. A FONSI was signed for the AMZs for MV-22 and Rotary-Wing Training on 21 May 2010 (USMC 2010b).

4.1.1.4 West Coast Basing of the F-35B

An EIS was prepared to analyze the potential impacts from the west coast basing of the F-35B aircraft. The F-35B would replace legacy F/A-18A/B/C/D Hornet and AV-8B Harrier aircraft in the Third and Fourth Marine Air Wings. The proposed action addressed in the EIS includes:

- basing of 11 operational F-35B Joint Strike Fighter squadrons (176 aircraft), and 1 F-35B Operational Test and Evaluation squadron (8 aircraft) on the West Coast of the U.S.;
- construction and/or renovation of airfield facilities and infrastructure necessary to accommodate and maintain the F-35B squadrons;
- changes to personnel to accommodate squadron staffing; and
- conducting F-35B readiness and training operations to attain and maintain proficiency in the operational employment of the F-35B and special exercise operations.

This EIS addresses six basing alternatives, none of which are at the Combat Center. However, the proposed action includes occasional use of airspace overlaying the Combat Center: Restricted Area 2501 North, South, East, and West; Bristol Air Traffic Controlled Assigned Airspace and Military Operations Area; and Sundance Military Operations Area. The frequency of airspace use would be equivalent to or less than current use by the aircraft that the F-35B is replacing. A Record of Decision for the West Coast Basing of the F-35B was signed on 9 December 2010 (DoN 2010).

4.1.1.5 Ocotillo Marine Mart

In March 2012, NAVFAC Southwest prepared an EA to evaluate the environmental consequences associated with construction of a new location exchange, gas station, and ancillary improvements (DoN and USMC 2012). The development footprint for this project is located within the Ocotillo Heights area of Mainside and does not overlap the ROI of the Proposed Action. Based on the results of the analysis, it was determined that there would be no significant impacts to the environment with implementation of the proposed action. A FONSI for the Ocotillo Marine Mart was signed on 19 March 2012 (DoN and USMC 2012).

4.1.1.6 P-128 Electrical Infrastructure Upgrades, 34.5kV to 115kV

An EA was prepared to evaluate the potential environmental impacts associated with P-128, Electrical Infrastructure Upgrades, which would construct and extend utilities to the new substation constructed by P-127 in support of planned facilities in the North Mainside build-out area. The project would construct the Leatherneck substation and upgrades to the Hi-Desert and Carodean substations off installation.

The new transmission substation would be constructed with three regulated transmission substation transformers (115-kV & 34.5-kV). Also, 115-kV and 38-kV switching and protective devices would be constructed at Building 3083J in the vicinity of the existing Ocotillo switching station. Existing substation upgrades include upgrading the existing SCE dedicated 34.5-kV medium voltage distribution system to a 115-kV high voltage transmission system and adding a new 115-kV high voltage transmission loop. In addition, a new 3-phase, 3-wire, 34.5kV medium voltage distribution line on 60-ft (18-m) class I poles would be extended. Supporting facilities include utility easements for the new utility corridor off-installation.

Based on the results of the analysis, it was determined that there would be no significant impacts to the environment with implementation of the proposed action. A FONSI for the P-128 Electrical Infrastructure Upgrades was signed on 24 March 2011.

4.1.1.7 Adult Medical Care Clinic Replacement

An EA was prepared to evaluate the potential environmental impacts associated with the proposed construction and operation of a replacement Adult Medical Care Clinic at the Combat Center. The proposed action involved the construction and operation of a replacement Adult Medical Care Clinic after the demolition of the existing Adult Medical Care Clinic buildings as well as the relocation of all personnel associated with the Adult Medical Care Clinic. Based on the results of the analysis, it was determined that there would be no significant impacts to the environment with implementation of the proposed action. A FONSI was signed for the Adult Medical Care Clinic Replacement on 22 February 2013 (USMC 2013b).

4.1.1.8 1.1 MW PV Project at the Combat Center

In 2011, a 6.5 ac (2.6 ha) the Morongo Basin Municipal Advisory Council, 1.1 MW solar PV project was constructed along the northeastern side of Truax Drive, near 4th Street, at Mainside (see Photo 3 in Section 1.1.2, *Solar PV Systems*). This single-axis tracking project is shown on Figure 4-1 and was expected to provide approximately 2.5% of the Combat Center's annual electrical needs (DoD 2012).

4.1.1.9 1.0 MW PV Project at the Combat Center

A Categorical Exclusion was prepared on 24 August 2011 for a 10 ac (4 ha), 1.0 MW solar PV project located directly northwest of the proposed PV site and immediately southeast of the water retention ponds (Figure 4-1). The Categorical Exclusion decision was revalidated on 27 February 2012 and again on 2 June 2014 (USMC 2014c).

4.1.1.10 Cascade Solar Farm

The Cascade Solar Farm was developed and held by Cascade Solar, LLC a subsidiary of Axio Power Holdings, LLC. The project application was submitted mid-2011 and began construction early 2013. The 19 MW project was built on approximately 150 ac (60 ha) using PV technology and is located in the unincorporated community of Joshua Tree approximately 11.5 miles (18.5 km) southwest of Mainside. In addition, the project is located on Cascade Road north of Highway 62, less than 1 mile east of the proposed Joshua Tree Solar Farm. The project was completed and placed into operation in April 2014.

4.1.1.11 Lone Valley Solar Project

The Lone Valley Solar Project consists of two separate permitted projects known as Agincourt Solar project and Marathon Solar project. The project is located south of State Route 247 on Camp Rock Road approximately 48 miles (77 km) northwest from Mainside. EDP Renewables purchased the shovel-ready properties in February 2014. Construction on the 30MW PV project began in March 2014 on approximately 230 ac (93 ha) (combined). The project was completed in January 2015.

4.1.1.12 Highland Solar I Project (SEPV8)

Solar Electric Solutions submitted an application early 2011 to develop a 12-MW, 100-ac (40-ha) project originally named "SEPV8." The project is located approximately 6.5 miles (10.5 km) from Mainside on Lear Avenue, north of Highway 62. Solar Electric Solutions started construction in mid-2011 and later sold the project to SolarWorld in May 2012. The project was completed and placed into operation in December 2012. In early 2013, the project was sold to Duke Energy and renamed to Highland Solar I.

4.1.2 Present Projects

4.1.2.1 Landfill No. 2 Expansion and Proposed Material Recovery and Recycling Facility

An EA was completed in December of 2006 to evaluate the environmental impacts associated with expanding the life of Landfill No. 2 to provide solid waste disposal capacity for the Combat Center for at least 30 years. The implementation timeframe for the expansion was flexible, depending on permitting requirements and availability of funds. The project, also referred to as P-617, would construct a material recovery facility complex, consisting of five separate buildings: a general waste sorting facility; recycled material sorting and bailing facility; recycled material storage building; vehicle holding shed; and a multi-story administrative support facility for the NREA that includes the Sections of Administrative, Compliance, Pollution Prevention, Hazardous Waste, Natural & Cultural Resources, Total Waste Management, and Range Residue Processing. The project would allow for complete management of solid waste through a material recovery facility complex to remove all recyclables prior to disposal in the expanded sanitary landfill, thus allowing the Combat Center to meet its regulatory requirements by extending the life of the landfill. P-617 would also demolish Building 1451 and eight re-locatable administrative trailers.

The proposed action included a vertical expansion, which would not change the approximately 30-ac (12-ha) landfill footprint, but would result in steepening of the side slope areas; a lateral expansion to the south of approximately 8.8 ac (3 ha); and a new landfill cell of approximately 33 ac (13 ha) east of the exiting landfill. A FONSI for the Landfill No. 2 Expansion and Proposed Material Recovery and Recycling Facility was signed on 31 January 2007 (USMC 2006).

4.1.2.2 West Coast Basing of the MV-22

An EIS was prepared to assess the potential impacts of the West Coast Basing of the MV-22 and associated construction components for expanded apron space and hangar upgrades, similar to the West Coast Basing of the F-35B (DoN 2009a). MV-22 aircraft from Marine Corps Air Station (MCAS) Miramar and MCAS Pendleton would utilize MCAS Yuma as transients during training operations. This project would involve improvements at the SELF, located to the northwest of the Proposed Action. The Marine Corps estimates these MV-22s would fly about 3,900 operations annually at the Combat Center SELF and in the associated airspaces, replacing transient helicopter traffic. The Record of Decision for the West Coast Basing of MV-22 was signed on 18 November 2009 (DoN 2009b). Transition from the helicopters to the MV-22 is scheduled to occur between 2010 and 2020.

4.1.2.3 Land Acquisition/Airspace Establishment to Support Large-Scale Marine Air Ground Task Force Live-Fire and Maneuver Training

An EIS was prepared to analyze the impacts from the proposed extension of existing installation operating areas through acquisition of additional training lands, modification and establishment of military special use airspace, and implementation of Marine Expeditionary Brigade-level sustained, combined-arms, live-fire, and maneuver training exercises within current and proposed operating areas at the Combat Center (USMC 2012). Proposed training activities would occur within existing training areas (located to the north and west of the proposed PV site), and within proposed land acquisition areas located along the border of the Combat Center. The expansion areas are located to the west, south, and east of the Combat Center. Major resource areas of concern include biological resources, cultural resources, air quality, socioeconomics, recreation, land use, public health and safety, and airspace management. A Final EIS was published in July 2012. The Record of Decision concluded that there would be a significant impact to the desert tortoise; however, it would not result in jeopardy of the species. Within

the Biological Opinion, USFWS concluded that take would occur due to military operations and concentrated Off-Highway Vehicle usage in the Johnson Valley area (USMC 2012, 2013a).

4.1.2.4 Ongoing Training

An EA is being prepared to evaluate the potential environmental impacts associated with the proposed updates to ongoing training activities. At present, training at the Combat Center is covered by the 2003 Ongoing and Proposed Training Activities Programmatic EA (USMC 2003). This EA is near the end of its life cycle and is restrictive in the types of training allowed. The new Ongoing Training EA is needed to enable operators to quickly determine the type of training that can be performed as well as where (i.e., in which zones/areas) the training can be performed within the installation. The new Ongoing Training EA will also analyze impacts associated with the use of current and future technologies, tactics, and equipment.

4.1.3 Reasonably Foreseeable Projects

4.1.3.1 Military Construction Projects

The remaining cumulative effects projects listed on Figure 4-1 and in Table 4-1 are MILCON-funded construction projects that have occurred, or would occur, in the Mainside area and training areas of the Combat Center. Only those MILCON-funded projects having the potential to interact directly or indirectly with the Proposed Action alternatives and that have not undergone evaluation under NEPA are included in Table 4-1. Unless otherwise noted, Figure 4-1 shows the location of the projects listed in Table 4-1 as well as the two other PV projects described above. Other testing and training activities at the Combat Center that do not have the potential to interact cumulatively with the Proposed Action are not addressed in this EA, as discussed at the beginning of Section 4.1. Many of these projects are not well defined at this time, and very little information is available to characterize the potential effects of each project; NEPA documentation has not yet been initiated for these planned future projects. NEPA documentation would be completed for each of these projects as they approach their respective planning stages. Therefore, the specific environmental consequences of these actions relative to the resources described in Section 4.2 would be analyzed in detail and disclosed to the public in accordance with NEPA. Appendix D, *Cumulative MILCON Projects*, provides additional details about each MILCON project, including the proposed size of each structure or infrastructure footprint and any project-specific site improvements or design features.

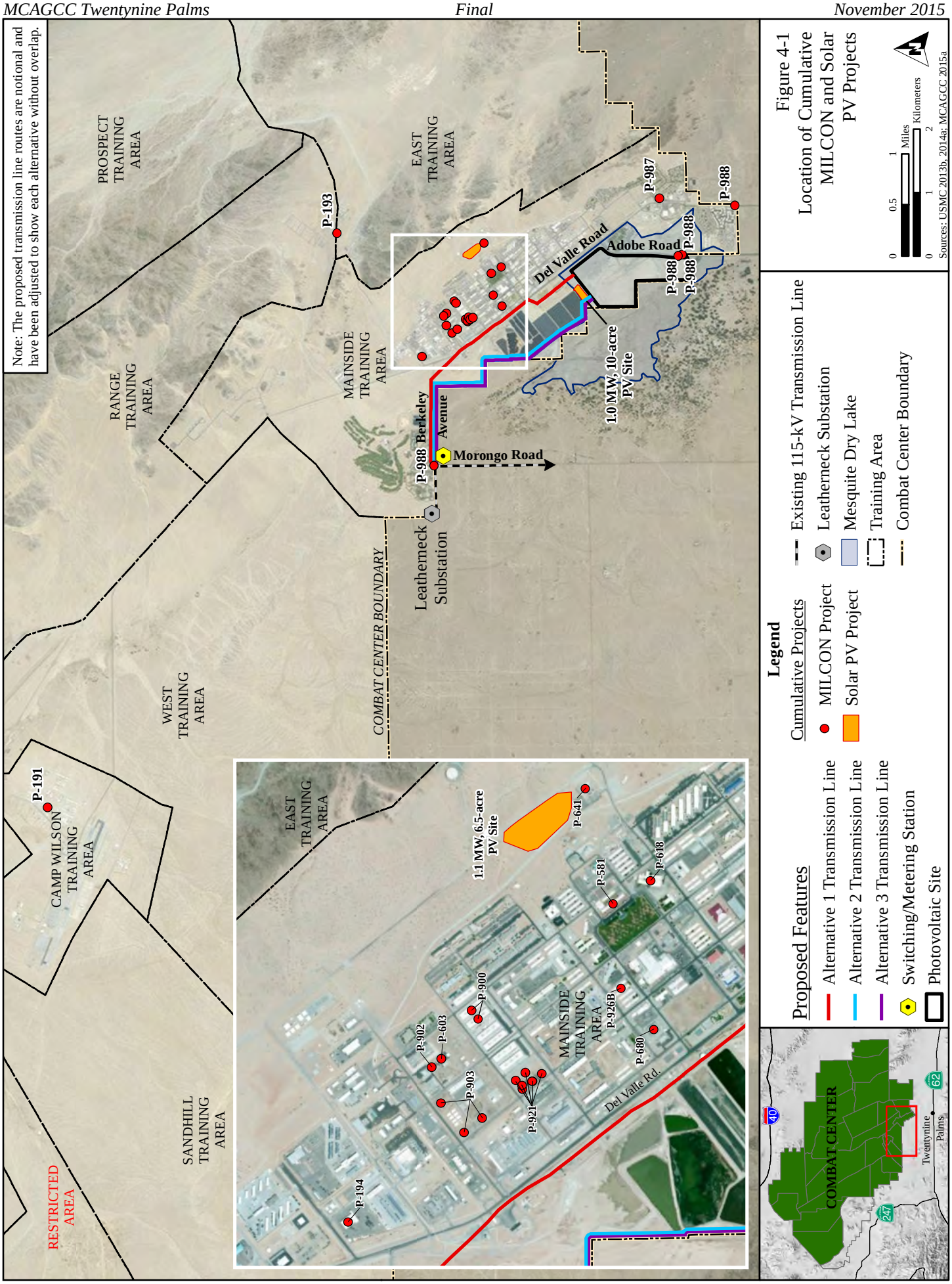

Figure 4-1
Location of Cumulative MILCON and Solar PV Projects

Table 4-1. Cumulative MILCON Projects

Project Number	Project Title	Size (ft^2)
P-191	Addition to Camp Wilson Gym (Building 5411)	3,208
P-193	Marksmanship Training Unit Multi-purpose Classroom	11,916
P-194	Convert Building 2025 to Wheeled Vehicle Maintenance Facility	22,680
P-581	MCAGCC Headquarters Building	22,270
P-602	Training Integration Center (*)	41,635
P-603	Vehicle Training and Equipment Facility	27,706
P-618	Multi-Purpose Administration Building	29,084
P-641	Addition East Gym (Building 1588)	19,999
P-662	Expeditionary Fighting Vehicle Maintenance Facility (*)	67,371
P-680	West Gym Addition	19,999
P-900	Marine Corps Communication and Electronic School (MCCES) Classroom	91,762
P-902	MCCES Bulk Supply Warehouse	12,109
P-903	MCCES Consolidated Radar Classroom	32,292
P-921	Electronic/Communications Maintenance & Storage Facility	34,853
P-926B	Library/Lifelong Learning Center, Phase II	21,000
P-987	Addition to Temporary Lodging Facility	8,860
P-988	Gate Reconfiguration, AT/FP Upgrades	2,497
P-989	Perimeter Fencing (North of Mainside) (*)	N/A

Notes: *Not shown on Figure 4-1.
Sources: USMC 2013b, 2014a.

4.2 CUMULATIVE IMPACTS

4.2.1 Biological Resources

The ROI for cumulative impact analysis for biological resources is the project area and lands having similar habitats and species in the region. As solar projects, urbanization, and military training pressures increase within the region, impacts to biological resources within the region are increasing on a cumulative level. When the Proposed Action/Alternative 1, or other action alternatives, are considered with other past, present, and probable future projects listed in Section 4.1, loss of habitat, habitat fragmentation, and other direct impacts to species, including federally-listed species, would contribute to the cumulative impacts to biological resources.

Like the Proposed Action/Alternative 1, the projects described in Section 4.1, however, have all committed to a number of mitigation measures, including but not limited to restoration plans, revegetation plans, and weed control efforts. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to biological resources.

4.2.2 Geological Resources

Implementation of the Proposed Action/Alternative 1 or either action alternative would result in less than significant impacts on geological resources. Cumulatively, the construction projects described in Section 4.1 would have minimal or no effects on topography and geology and only very minor, temporary, and localized effects on soils in the immediate vicinity of each project. Any potential impacts resulting from erosion during any construction activities on the installation would be controlled through adherence to the

Combat Center's SWPPP and the use of standard erosion control measures such as sandbags, silt fencing, earthen berms, or temporary sedimentation basins. Potential large-scale training exercises proposed within an expanded Combat Center (to either the west or east of the current USMC property and a small area to the east of Mainside) would require new designated target areas for weapons delivery, which would result in localized ground disturbance and increased dust. These areas are too far removed from the Proposed Action/Alternative 1 and the other action alternatives to have any cumulative effect. The Proposed Action/Alternative 1 or the other action alternatives would not expose new persons or a substantial number of structures to potential geological hazards, such as seismic-related ground failure, thereby adding to the overall regional risks associated with geological hazards. The incremental effects of the Proposed Action/Alternative 1 or the other action alternatives would not add appreciably to any existing or future erosion associated with other anthropogenic activities. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to geological resources.

4.2.3 Water Resources

Implementation of the Proposed Action/Alternative 1 or the action alternatives would result in less than significant impacts to water resources. The private partner would be responsible for identifying and contracting with one or more local water districts to purchase the water required for the Proposed Action/Alternative 1 or the action alternatives. The Proposed Action/Alternative 1 or the action alternatives would not significantly impact local, regional, or statewide water sources, including groundwater and surface water. Cumulatively, the construction projects described in Section 4.1 would not have any appreciable cumulative impact to water resources in terms of quality and availability. The Grow the Force personnel increase and the extension of operating area for large-scale MEB training exercises would increase the demand for potable water at the Combat Center, but would not exceed available supplies. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to water resources.

4.2.4 Cultural Resources

The ROI for cumulative impact analysis for cultural resources is the project area and adjacent land. This ROI was defined because it encompasses the area within which the alternatives could contribute toward cumulative effects on archaeological resources, architectural resources, and/or traditional cultural resources. No cultural resources occur within the area of potential effect. Therefore, with implementation of the proposed monitoring requirements, and with concurrence from the SHPO (refer to Appendix E), implementation of any of the Proposed Action/Alternative 1 or the action alternatives would not affect cultural resources (refer to Section 3.4.4, *Environmental Consequences*). Furthermore, the past, present, and reasonably foreseeable projects described in Section 4.1 are either not located within the ROI for the Proposed Action or would affect cultural resources within the ROI. As such, they would not contribute toward a cumulative impact relative to cultural resources. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to cultural resources.

4.2.5 Air Quality

4.2.5.1 Criteria Pollutants Cumulative Effects Analysis

The ROI in this air quality cumulative effects analysis includes the MDAB. The minor impacts to air quality from the Proposed Action/Alternative 1 or action alternatives that could contribute to potential cumulative impacts would be from the short-term air emissions from trucks and vehicles used during the construction of the project. Operational air emissions would be negligible compared to the existing condition and would not result in significant long-term increases in air emissions. The listed cumulative projects would also be required to conform to CAA General Conformity Rule requirements and the MDAB SIP, and would not produce significant amounts of air emissions.

Nominal cumulative impacts would result from implementation of the Proposed Action/Alternative 1 or action alternatives, in conjunction with impacts from other potentially cumulative projects listed in Section 4.1. For all projects, construction and operation activities would be expected to produce air emissions that would be below applicable CAA conformity significance thresholds. The combined air emissions of the Proposed Action/Alternative 1 or action alternatives and potentially cumulative projects would not contribute to an exceedance of an ambient air quality standard. As a result, proposed construction and operational activities would produce less than cumulatively considerable air quality impacts. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to air quality.

4.2.5.2 Greenhouse Gases Cumulative Effects Analysis

The potential effects of GHG emissions are by nature global and cumulative and it is impractical to attribute climate change to individual activities. Therefore, an appreciable impact to global climate change would only occur when GHG emissions associated with the Proposed Action/Alternative 1 or action alternatives are combined cumulatively with GHG emissions from other human-made activities on a global scale.

In December of 2014, the CEQ issued revised draft guidance for federal agencies, to guide them on when and how to consider the effects of GHG emissions and climate change in their projects (CEQ 2014). In the analysis of the direct effects of a Proposed Action, the CEQ proposes that it would be appropriate to (1) quantify cumulative emissions over the life of the project; (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and (3) qualitatively discuss the link between such GHG emissions and climate change. Therefore, formulating significance criteria for GHG emissions is problematic, as it is difficult to determine what level of proposed emissions would substantially contribute to global climate change. The CEQ recommends that 25,000 metric tons of CO_{2e} or more being produce by a Proposed Action be considered the threshold warranting a more substantial evaluation of—but not necessarily a determination of—significance of climate change impact (CEQ 2014).

Table 4-2 summarizes the annual GHG emissions that would occur with implementation of the Proposed Action or action alternatives.

Table 4-2. Estimated Annual GHG Emissions under the Proposed Action/Alternative 1 or Action Alternatives

Scenario/Activity	Metric tons per year			
	CO_2	CH_4	N_2O	CO_2e[1]
Construction				
Year 1 - 2016	607.027	0.168	0.000	610.556
Year 2 - 2017	787.603	0.211	0.000	792.038
Operation				
Yearly Emissions	313.04	1.3	0.01	344.49
Decommissioning				
Year 2053	87.343	0.003	0.000	87.405

Note: [1]$CO_2e = CO_2 + (21 * CH_4) + (310 * N_2O)$.

As an indication of the nominal relative magnitude of these emissions, total annual CO_2e emissions in the U.S. were approximately 5.5 billion metric tons (USEPA 2014). The annual GHG emissions during the lifespan of this proposed solar PV project would be less than 0.00004% of the total annual emissions of the entire U.S. The annual emissions GHG would also be well below the 25,000 metric tons of CO_2e threshold proposed by CEQ.

Potentially cumulative projects in the vicinity of the Proposed Action/Alternative 1 (listed in Section 4.1) could also release a nominal amount of GHGs from construction and operation activities when compared to the total annual CO_2e emissions in the U.S. Also, in response to DoD directives such as EO 13221 *Energy Efficient Standby Power Devices* and EO 13693 *Planning for Federal Sustainability in the Next Decade*, the DoN has taken a number of steps to reduce GHG emissions from their activities. These actions include developing energy efficient technologies and weapons systems, improving military and civilian vehicles fuel efficiency, utilizing alternative fuel vehicles and electric vehicles, improving energy efficiency at DoN facilities, and installing solar and other renewable energy sources at DoN facilities.

Long-term beneficial impacts to air quality would occur with implementation of the solar PV system due to the benefits of contributing to the energy/power grid through alternative energy development and reducing GHG. The Proposed Action/Alternative 1 or action alternatives in conjunction with the other past, present, and future solar energy projects would have a beneficial impact to the MDAB as a whole due to the potential reduction in GHG as compared to burning fossil fuels for electricity generation. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to global climate change.

4.2.6 Utilities

The ROI for cumulative impact analysis for utilities includes utilities serving the three action alternatives and surrounding areas as this area encompasses all utilities directly serving the action alternatives. The Grow the Force initiative has upgraded, or plans to upgrade, communication, electrical, potable water, wastewater, and natural gas utility systems resulting in vastly increased capacity for future projects at the Combat Center. The implication of past projects is evident in the existing conditions discussion in Section 3.6.2, *Existing Utility Framework*, and 3.6.3, *Affected Environment*. Section 3.6.4, *Environmental Consequences*, indicates that the Proposed Action/Alternative 1, or the other action alternatives, would have a negligible impact to utilities and would provide some beneficial impacts as

well. Other present and reasonably foreseeable future projects would be required to evaluate their impacts on utilities and to provide necessary upgrades. Therefore, implementation of the Proposed Action/Alternative 1 or the other action alternatives, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to utilities.

4.3 CUMULATIVE IMPACTS CONCLUSION

Cumulative impacts to the environmental resource areas evaluated herein from the action alternatives, in conjunction with other past, present, and reasonably foreseeable actions, would not be significant.

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CHAPTER 7
REFERENCES

AES Solar. 2011. Imperial Valley Solar Project Plan of Development. 20 June. Available online at: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/elcentro/nepa/2010/eis/ivsolar.Par.35931.File.dat/IVS%20POD%20Final.pdf.

APLIC. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

APLIC. 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

Barker, Bridget, PhD. 2015. Personal communication via telephone and email with Dr. Bridget Barker, Assistant Professor, Center for Fungal Pathogens, Translational Genomics Research Institute, and Mr. Chris Noddings, Cardno Deputy Project Manager, regarding the potential for Valley Fever within the project area. 4-16 September.

Basin Energy Assessment Team. 2013. Basin Energy Assessment Team Renewable Energy Analysis. October. Available online at: http://www.drecr.com/526190_final_BEAT_REPORT_10_1_13.pdf.

BizEE Energy Lens. 2014. kW and kWh Explained. Available online at: http://www.energylens.com/articles/kw-and-kwh. Accessed on 5 February 2015.

Bureau of Land Management. 2014. First Quarter Report for Biological Resources Monitoring, First Solar Desert Sunlight Solar Project, Riverside County. Prepared by Ironwood Consulting, Inc. 1 January – 31 March.

Brightstar Solar. 2014. Common Sizes of Solar Panels. 12 February. Available online at: http://brightstarsolar.net/2014/02/common-sizes-of-solar-panels/. Accessed on 3 February 2015.

California Air Pollution Control Officers Association. 2015. California Emissions Estimator ModelTM. Available online at: http://www.aqmd.gov/caleemod/. Accessed on 2 February 2015.

California Department of Public Health. 2013a. HESIS Fact Sheet: Preventing Work-Related Coccidioidomycosis (Valley Fever). June. Available online at: https://www.cdph.ca.gov/programs/hesis/Documents/CocciFact.pdf. Accessed on 27 August.

California Department of Public Health. 2013b. Preventing Occupational Valley Fever at Solar Farm Construction Sites, San Luis Obispo County. Letter to Solar Farm Construction Subcontractor from Barbara Materna, Ph.D., CIH, Chief, Occupational Health Branch. 23 July.

California Department of Public Health. 2015a. Yearly Summaries of Selected General Communicable Diseases In California, 2001-2010. 27 May. Available online at: https://www.cdph.ca.gov/data/statistics/Documents/YearlySummaryReportsofSelectedGeneralCommDiseasesinCA2001-2010.pdf#page=27. Accessed on 15 September 2015.

California Department of Public Health. 2015b. Yearly Summaries of Selected General Communicable Diseases In California, 2011-2014. 27 May. Available online at: http://www.cdph.ca.gov/data/statistics/Documents/YearlySummaryReportsofSelectedGeneralCommDiseasesinCA2011-2014.pdf#page=29. Accessed on 15 September 2015.

California Geological Survey. 2005. Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, version 2.0: California Geological Survey Web Page. Complied by W. A. Bryant. Available online at: http://www.consrv.ca.gov/cgs/information/publications/Pages/quaternaryfaults_ver2.aspx.

California Herps. 2014. Available online at: http://www.californiaherps.com/. Accessed on 21 October.

California Native Plant Society. 2015. Inventory of Rare, Threatened, and Endangered Plants of California. Available online at: http://www.rareplants.cnps.org/. Accessed on 13 February.

Cal/OSHA. 2013. Advice to Employers and Employees Regarding Work-related Valley Fever. October. Available online at: http://www.dir.ca.gov/dosh/valley-fever-home.html. Accessed 16 September 2015.

California Seismic Safety Commission. 2005. Homeowner's Guide to Earthquake Safety. Available online at: http://www.seismic.ca.gov/pub/CSSC_2005-01_HOG.pdf. Accessed on 20 October 2014.

CARB. 2014. California Greenhouse Gas Emission Inventory, 2000-2012. May.

CARB. 2015a. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed on 9 February 2015.

CARB. 2015b. Area Designations Maps/ State and National. http://www.arb.ca.gov/desig/adm/adm.htm. Accessed on 9 February 2015.

CARB. 2015c. Climate Change Programs. http://www.arb.ca.gov/cc/cc.htm. Accessed on 2 February 2015.

CDFW. 2014a. California Natural Diversity Database GIS Query. 20 October.

CDFW. 2014b. California Natural Diversity Database Special Animals List. September. Available online at: ftp://ftp.consrv.ca.gov/pub/oil/SB4DEIR/docs/BIOT_CDFW_2014l.pdf.

CEQ. 1997. Environmental Justice Guidance Under the National Environmental Policy Act. 10 December. Available online at: http://www3.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf.

CEQ. 2014. Memorandum For Heads of Federal Departments and Agencies. Revised Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions. December.

Center for Disease Control. 2012. Fungal pneumonia: a silent epidemic - Coccidioidomycosis (Valley Fever). Fact Sheet. December 2012. Available online at: http://www.cdc.gov/fungal/pdf/cocci-fact-sheet-california-final-508c.pdf.

Center for Disease Control. 2013. Valley Fever: Awareness is Key. 27 June. Available online at: http://www.cdc.gov/features/valleyfever/. Accessed on 15 September 2015.

Center for Disease Control. 2015. Valley Fever (Coccidioidomycosis). 20 July. Available online at: http://www.cdc.gov/fungal/diseases/coccidioidomycosis/. Accessed 16 September.

City of Twentynine Palms. 2012. General Plan Update. Available online at: http://www.ci.twentynine-palms.ca.us/Mission_Statement.46.0.html.

Desert Renewable Energy Conservation Plan Independent Science Advisors. 2010. Recommendations of Independent Science Advisors for The California Desert Renewable Energy Conservation Plan

(DRECP). Available online at: http://www.energy.ca.gov/2010publications/DRECP-1000-2010-008/DRECP-1000-2010-008-F.PDF.

Dobos, Robert. 2014. Webinar: Valley Fever Habitat Model. Available online at: https://www.youtube.com/watch?v=L_rECGU4zkI. 18 November. Accessed on 9 September 2015.

Dobos, Robert. 2015. Personal communication via email with Mr. Robert Dobos, Soils Scientist, USDA NRCS, and Mr. Chris Noddings, Cardno Deputy Project Manager, regarding the potential for Valley Fever within the project area. 4-10 September.

DoD. 2012. Strategic Sustainability Performance Plan: FY 2012. 20 September. Available online at: http://www.acq.osd.mil/ie/download/green_energy/dod_sustainability/2012/DoD%20SSPP%20FY12-FINAL.PDF.

DoD ESTCP. 2012. Solar Energy Development on Department of Defense Installations in the Mojave and Colorado Deserts. Final. January. Available online at: http://www.acq.osd.mil/ie/download/Solar_Energy_Development_on_DoD_Installations_in_the_Mojave_and_Colorado_Deserts.pdf

DoN. 2009a. Final Environmental Impact Statement for the West Coast Basing of the MV-22. October.

DoN. 2009b. Record of Decision for the West Coast Basing of the MV-22. 18 November. Available online at: http://www.29palms.marines.mil/Portals/56/Docs/G4/NREA/MV-22%20ROD%20Signed%2018Nov09.pdf.

DoN. 2010. Record of Decision for the U.S. Marine Corps West Coast Basing of the F-35B Aircraft. 9 December 2010.

DoN. 2012. Department of the Navy Strategy for Renewable Energy. 1 Gigawatt Task Force. October. Available online at: http://www.secnav.navy.mil/eie/ASN%20EIE%20Policy/DASN_EnergyStratPlan_Finalv3.pdf.

DoN. 2015. Energy. Available online at: http://greenfleet.dodlive.mil/energy/. Accessed on 3 February 2015.

DoN and USMC. 2012. Environmental Assessment and Finding of No Significant Impact for Ocotillo Marine Mart and Gas Station, Marine Corps Air Ground Combat Center, Twentynine Palms, CA. March.

DoN and USMC. 2015. Feasibility Study for Construction and Operation of a Solar Photovoltaic System at Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California. Final. January.

Edwards, Phyllis Q. and Carroll E. Palmer. 1957. Prevalence of Sensitivity to Coccidioidin, with Special Reference to Specific and Nonspecific Reactions to Coccidioidin and Histoplasmin. *CHEST.* 31(1):35-60. doi:10.1378/chest.31.1.35. January.

Federal Register. 2014. Department of the Interior, Bureau of Indian Affairs: Indian Entities Recognized and Eligible to Receive Services from the U.S. Bureau of Indian Affairs. Vol. 79, No. 19. 29 January. Available online at: http://www.bia.gov/cs/groups/public/documents/text/idc006989.pdf.

Galgiani, John, PhD. 2015. Personal communication via telephone with Dr. John Galgiani, Director, Valley Fever Center for Excellence, University of Arizona, and Mr. Chris Noddings, Cardno Deputy Project Manager, regarding Valley Fever. 4 September.

Goodyear, Dana. Death Dust: the valley-fever menace. The New Yorker Magazine. 20 January. Available online at: http://www.newyorker.com/magazine/2014/01/20/death-dust. Accessed on 15 September 2015.

Guevara RE, Motala T, and D. Terashita. 2015. The Changing Epidemiology of Coccidioidomycosis in Los Angeles (LA) County, California, 1973–2011. PLoS ONE 10(8): e0136753. doi:10.1371/journal.pone.0136753

Hi-Desert Water District. 2011. 2010 Urban Water Management Plan. Prepared by Kennedy/Jenks Consultants. June. Available online at: http://www.water.ca.gov/irwm/grants/docs/Archives/Prop84/Submitted_Applications/P84_Round2_Implementation/Mojave%20Water%20Agency%20%28201312340031%29/Attachment%207.%20%28cont%29%20-%20Att7_IG2_TechJust_5of8.pdf.

Hollingsworth, B.D. and K.R. Beaman. 1998. Mojave Fringe-Toed Lizard. Available online at: http://www.blm.gov/ca/pdfs/cdd_pdfs/fringe1.PDF. Accessed on 12 February 2015.

Horvath, G., Blaho, M., Egri, A., Kriska, G., Seres, I., and B. Robertson. 2010. Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. Conservation Biology. 24(6):1644-53.

Intergovernmental Panel on Climate Change. 2012. Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel on Climate Change. http://srren.ipcc-wg3.de/report/IPCC_SRREN_Full_Report.pdf. Accessed on 6 February 2015.

Jones, Lawrence L. C. and R. E. Lovich. 2009. Lizards of the American Southwest. Mojave Fringe-toed Lizard by Robert Espinoza. Rio Nuevo Publishers.

Joshua Tree Water District. 2011. 2010 Urban Water Management Plan. Prepared by Kennedy/Jenks Consultants. June. Available online at: http://www.jbwd.com/wp-content/uploads/2014/02/UWMP_JBWD_2010-Final-with-Appendices-1.pdf.

Kagan, R.A., Viner, T.C., Trail, P.W. and E.O. Espinoza. 2014. Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis. National Fish and Wildlife Forensics Laboratory. 23 April.

Lauer, Antje, PhD. 2015. Personal communication via telephone and email with Dr. Antje Lauer, Associate Professor of Microbiology, California State University Bakersfield, and Mr. Chris Noddings, Cardno Deputy Project Manager, regarding the potential for Valley Fever within the project area. 4-16 September.

Londquist, C.J. and P. Martin. 1991. Geohydrology and Groundwater Flow Simulation of the Surprise Spring Basin Aquifer System, San Bernardino County, CA. U.S. Geological Survey Water-Resources Investigations Report 89-4099.

MCAGCC. 2009. Master Plan Update, Final Report. June.

MCAGCC. 2012a. Integrated Natural Resource Management Plan. Fiscal Years 2012-2016. Marine Air Ground Task Force Training Command, Twentynine Palms, California. January.

MCAGCC. 2012b. Fault Surface Rupture Hazard Investigation: Proposed Medical Clinic Replacement. July.

MCAGCC. 2012c. Fault Rupture Study: Proposed Quality of Life MILCON Projects P-5114, P-116, P-163, and P-170. February.

MCAGCC. 2014a. Personal communication during interview with Dr. Brian Henen, NREA MCAGCC 29 Palms, Mr. Doug Billings, Cardno Program Manager, Ms. Stella Acuna, Cardno Project Manager, and Mr. Chris Noddings, Cardno Deputy Project Manager. 2 October.

MCAGCC. 2014b. Personal communications via email with Erin Adams, G5 MAGTFTC, MCAGCC, Resource Management Group, Community Plans and Encroachment. 16 October 2014.

MCAGCC. 2015a. GIS Data.

MCAGCC. 2015b. Archeological Resources Survey Report: Archeological Survey of 396 Acres for Proposed Photovoltaic Array on the Mesquite Dry Lake Playa in the Mainside Area. ABR125. Marine Corps Air Ground Combat Center, Twentynine Palms, San Bernardino County, California.

MCAGCC 2015c. Personal communication via email from Dave Marks, Public Affairs Officer for Naval Hospital Twentynine Palms at the Marine Corps Air Ground Combat Center, to Scott Kerr, NEPA Program Manager at the Marine Corps Air Ground Combat Center, in response to questions concerning reported cases of Valley Fever aboard the Marine Corps Air Ground Combat Center. 15 September.

MCAGCC 2015d. Personal communication via telephone with Dr. Brian Henen, NREA MCAGCC 29 Palms, and Mr. Chris Noddings, Cardno Deputy Project Manager, regarding rodent and saltbush presence within the project area. 16 September.

MDAQMD 2009. MDAQMD California Environmental Quality Act and Federal Conformity Guidelines. Planning and Rule Making Section, Surveillance Section. February.

Mellon, K. 2002. Letter to B.W. Soderberg regarding the Inventory and Evaluation for National Register of Historic Places Eligibility for Cold War-Era Buildings and Structures for the Marine Air Ground Combat Center, Twentynine Palms, San Bernardino County. 30 August.

National Renewable Energy Laboratory. 2012. Funding Solar Projects at Federal Agencies: Mechanisms and Selection Criteria. 4 September. Available online at: https://financere.nrel.gov/finance/content/funding-solar-projects-federal-agencies-power-purchase-agreements-energy-service-contracts-utility-enhanced-use-leases. Accessed on 3 February 2015.

NAVFAC Engineering Service Center. 2009. Results of Ambient Air Sampling During Calendar Year 2008 at Marine Corps Air Ground Combat Center Twentynine Palms, California.

NAVFAC Southwest. 2011. MCAGCC Twentynine Palms Master Plan Addendum: Old Camp Redevelopment. Contract Number N62473-08-D-8603. Post Final. January.

NAVFAC Southwest. 2014. Grading and Drainage Plan for Sun Edison MCAGCC 29 Palms Photovoltaic Array. 26 June.

Office of Energy Efficiency and Renewable Energy. 2013a. Flat-Plate Photovoltaic Module Basics. 20 August. Available online at: http://energy.gov/eere/energybasics/articles/flat-plate-photovoltaic-module-basics. Accessed on 3 February 2015.

Office of Energy Efficiency and Renewable Energy. 2013b. Flat-Plate Photovoltaic System Basics. 20 August. Available online at: http://energy.gov/eere/energybasics/articles/flat-plate-photovoltaic-system-basics. Accessed on 3 February 2015.

San Bernardino County Department of Public Health. 2013. County of San Bernardino Department of Public Health Fact Sheet: Coccidioidomycosis. August. Available online at: http://www.sbcounty.gov/uploads/dph/dehs/Depts/EnvironmentalHealth/EHSDocuments/Coccidioidomycosis.pdf.

San Bernardino County Department of Public Health. 2015. 2014 Annual Morbidity Report. July. Available online at: http://www.sbcounty.gov/uploads/dph/publichealth/documents/AnnualReport2014.pdf. Accessed on 15 September 2015.

Twentynine Palms Water District. 2014. Groundwater Management Plan - 2014 Update. Prepared by Kennedy/Jenks Consultants. May 28.

University of Arizona Valley Fever Center for Excellence. 2010a. Valley Fever (Coccidioidomycosis). Available online at: http://www.vfce.arizona.edu/valleyfeverinpeople/faqs.aspx. Accessed on 27 August 2015.

University of Arizona Valley Fever Center for Excellence. 2010b. Valley Fever in People. Available online at: http://www.vfce.arizona.edu/ValleyFeverInPeople/Default.aspx. Accessed on 14 September 2015.

University of Arizona Valley Fever Center for Excellence. 2010c. Risk of Dissemination. Available online at: http://www.vfce.arizona.edu/ValleyFeverInPeople/RiskOfDissemination.aspx. Accessed on 14 September 2015.

University of Arizona Valley Fever Center for Excellence. 2015. Valley Fever (Coccidioidomycosis): Tutorial for Primary Care Professionals. Available online at: https://www.vfce.arizona.edu/resources/pdf/Tutorial_for_Primary_care_Physicians.pdf. Accessed on 14 September 2015.

UC Davis Health System. 2014. Valley fever re-emerges in California: What you need to know. 6 March. Available online at: https://www.ucdmc.ucdavis.edu/welcome/features/2013-2014/03/20140306_valley-fever.html. Accessed on 15 September 2015.

Upton, John. 2014. Solar Farms Threaten Birds. Scientific American. Published online at: http://www.scientificamerican.com/article/solar-farms-threaten-birds/. 27 August.

USDA. 2014. Web Soil Survey for Marine Corps Air Ground Combat Center at Twentynine Palms, California. U.S. Department of Agriculture. Available online at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed on 20 October.

USDA. 2015. Web Soil Survey for Marine Corps Air Ground Combat Center at Twentynine Palms, California. U.S. Department of Agriculture. Available online at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed on 9-16 September 2015.

U.S. Energy Information Administration. 2014. Frequently Asked Questions: How much electricity does an American home use? 10 January. Available online at: http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3. Accessed on 5 February 2015.

USEPA. 2014. 2012 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012. http://www.epa.gov/climatechange/emissions/usinventoryreport.html. Accessed on 04 August 2014.

USEPA. 2015a. The Green Book Nonattainment Areas for Criteria Pollutants. http://www.epa.gov/oar/oaqps/greenbk/. Accessed on 2 February 2015.

USEPA. 2015b. General Conformity *De Minimis* Levels. http://www.epa.gov/oar/genconform/deminimis.html. Accessed on 30 January 2015.

USMC. 2003. Programmatic Environmental Assessment for Ongoing and Proposed Training Activities at the Marine Corps Air Ground Combat Center Twentynine Palms, California. May.

USMC. 2006. Environmental Assessment and Finding of No Significant Impact for the Landfill No. 2 Expansion and Proposed Material Recovery and Recycling Facility. Marine Corps Air Ground Combat Center, San Bernardino County, CA. 21 December.

USMC. 2009. Final Environmental Assessment for Permanent Facilities Bed-Down of Increased End-Strength at Marine Corps Air Ground Combat Center Twentynine Palms, CA. September.

USMC. 2010a. Revised Draft Environmental Assessment Construction of Electrical System Upgrade at MCAGCC. Twentynine Palms, CA. December.

USMC. 2010b. Environmental Assessment and Finding of No Significant Impact for Aerial Maneuver Zones for MV-22 and Rotary-Wing Training at the Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, California. May.

USMC. 2012. Final Environmental Impact Statement for Land Acquisition and Airspace Establishment to Support Large-Scale Marine Air Ground Task Force Live Fire and Maneuver Training. Marine Corps Air Ground Combat Center Twentynine Palms. July.

USMC. 2013a. Record of Decision for Land Acquisition and Airspace Establishment to Support Large-Scale Marine Air Ground Task Force Live-Fire and Maneuver Training at the Marine Corps Air Ground Combat Center, Twentynine Palms, CA. 11 February. Available online at: http://www.29palms.marines.mil/Portals/56/Docs/G4/LAS/ROD%2029%20Palms%20CA.pdf.

USMC. 2013b. Final Environmental Assessment for the Adult Medical Care Clinic Replacement, Marine Corps Air Ground Combat Center, Twentynine Palms, California. February.

USMC. 2014a. Supplemental Environmental Assessment for Proposed Changes to the Permanent Facilities Bed-Down and Infrastructure Project at Marine Corps Air Ground Combat Center, Twentynine Palms, CA. August.

USMC. 2014b. Finding of No Significant Impact (FONSI) and Record Of Non-Applicability (RONA) for Clean Air Act Conformity for Proposed Changes to the Permanent Facilities Bed-Down and Infrastructure Project at Marine Corps Air Ground Combat Center, Twentynine Palms, CA. 22 August.

USMC. 2014c. Revalidation of Memorandum of Decision for Categorical Exclusion (CATEX). 2 June.

USMC Western Area Counsel Office. 2011. Executive Order 11988, Floodplain Management Applicability to Photo-Voltaic Solar Project at Marine Corps Air Ground Combat Center, Twentynine Palms, California. 23 December.

Vugia, D. J., C. Wheeler, K. C. Cummings, and A. Karon. 2009. Increase in Coccidioidomycosis: California, 2000-2007. Morbidity and Mortality Weekly Report. 58(05); 105-109. 13 February. Available online at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5805a1.htm. Accessed 15 September 2015.

Western Regional Climate Center. 2014. Twentynine Palms, California Period of Record Monthly Climate Summary. Period of Record: 7/1/1948 to 12/31/2005. http:/www.wrcc.dri.edu/cgi-bin/climain.pl?catwen. Accessed on 20 October.

Appendix A

Public Involvement Process

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OUTLINE OF THE PUBLIC INVOLVEMENT PROCESS

Introduction

The U.S. (U.S.) Marine Corps (USMC) has conducted a public participation process to provide the public the opportunity to participate in the project by submitting comments on the adequacy and accuracy of the Draft Environmental Assessment (EA). The purpose of the public involvement program is to notify and inform interested and potentially affected stakeholders and the general public about the Proposed Action and solicit their input on the environmental analysis. The National Environmental Policy Act (NEPA), and regulations for implementing NEPA as set forth by the Council on Environmental Quality (CEQ), requires federal agencies to make diligent efforts to involve stakeholders and tribes in the development of environmental documents and stipulates public involvement during various stages of the environmental review process (42 U.S. Code § 4321, as amended; CEQ Regulations for Implementing NEPA, 40 Code of Federal Regulations Part 1500, as amended).

Public Involvement Overview

The public participation process commenced with publication of a Notice of Availability (NOA) of the Draft EA in two local newspapers (the *Hi-Desert Star* and the *Desert Trail*); the NOA of the Draft EA was published once per week per newspaper for two weeks for a total of four publications on 9 July and 16 July 2015. The Draft EA was also made available at two local libraries (the Twentynine Palms Branch Library and the Yucca Valley Branch Library) and online, on a Marine Corps Air Ground Combat Center (MCAGCC) website. No public meeting was held. A 30-day public comment period was provided on the Draft EA; written comments were to be sent via mail to:

Ryan Maynard, Twentynine Palms Solar PV System EA Project Manager
NAVFAC Southwest
Central IPT, Building 1, 3rd Floor
937 North Harbor Drive
San Diego, California 92132

Comments were due by 8 August 2015. No comments were received on the Draft EA.

The public participation process will conclude with publication of a NOA of the Final EA. Publication of the NOA of the Final EA will follow the same methods as described above for the Draft EA (i.e., two local newspapers for a total of four publications). Pending the results of this analysis, the decision document could be a Finding of No Significant Impact (FONSI). The Final EA and potential FONSI (if appropriate) will be made available to the public for review in the Twentynine Palms Branch and the Yucca Valley Branch Libraries and online, on a MCAGCC website.

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PROOF OF PUBLICATION
(2015.5 C.C.P.)

This space is for the County Clerk's Filling Stamp

STATE OF CALIFORNIA
County of San Bernardino

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the:

HI-DESERT STAR

a newspaper of general circulation, printed and

published WEEKLY

in the City of YUCCA VALLEY County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California,

under the date of 11/27, 1961.

Case Number 107762 : that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-witt:

7/9, 7/16
all in the year **2015.**

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at: YUCCA VALLEY, California,

this **16TH** day of **JULY, 2015.**

Signature
MINDIE REDLIN

Proof of Publication
NOTICE OF AVAILABILITY

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT FOR THE CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT THE MARINE AIR GROUND TASK FORCE TRAINING COMMAND, MARINE CORPS AIR GROUND COMBAT CENTER, TWENTYNINE PALMS, CALIFORNIA

The Department of the Navy (DoN) and the United States Marine Corps (USMC) gives notice that a Draft Environmental Assessment (EA) has been prepared for the construction and operation of a solar photovoltaic system at the Marine Air Ground Task Force Training Command (MAGTFTC), Marine Corps Air Ground Combat Center (MCAGCC) located at Twentynine Palms, California.

The Draft EA evaluates the potential environmental impacts associated with implementing the proposed action at MAGTFTC, MCAGCC. The Draft EA analyzes three action alternatives and the No Action Alternative:

Alternative 1 involves the construction, operation, maintenance, and eventual decommissioning of a 241-ac (97-ha) solar PV system at Mainside, west of Adobe Road and a transmission line to transmit the energy to the civilian grid.

Alternative 2 involves consists of all of the actions proposed under Alternative 1, with the only difference being the location for the new transmission line. The new transmission line would follow the Combat Center's boundary to the west and northwest of the proposed solar PV site.

Alternative 3 consists of all of the actions proposed under Alternative 1, the only difference being the location for the new transmission line. The new transmission line would follow the same route as Alternative 2 except for the portion of the line along Berkeley Avenue. Along Berkeley Avenue, instead of sharing the alignment with the existing 34.5-kV transmission line, the new transmission line would exit the Combat Center and be located outside of the Combat Center.

No-Action Alternative: Under the No-Action Alternative, the construction and operation of a solar photovoltaic system would not occur.

The Draft EA evaluates the potential environmental effects of each alternative on certain resource areas including biological resources, geological resources, water resources, cultural resources, air quality, and utilities.

The DoN/USMC invites the public to review and comment on the Draft EA. The Draft EA prepared for this action may be reviewed by interested parties at the Twentynine Palms Branch Library at 6078 Adobe Road, Twentynine Palms, California 92277, and the Yucca Valley Branch Library at 57098 29 Palms Highway, Yucca Valley, California 92284 as well as the Combat Center website: http://www.29palms.marines.mil/Staff/G4InstallationsandLogistics/NREA.aspx.

Comments may be submitted to: Naval Facilities Engineering Command Southwest, NAVFAC Southwest; Central IPT, Building 1, 3rd Floor; 937 North Harbor Drive; San Diego, California 92132. Attn: Ryan Maynard, Twentynine Palms Solar PV System EA Project Manager, Phone (619) 532-3728, email: ryan.maynard1@navy.mil. Public comments must be received by August 8, 2015 to be considered in the Final EA.

(PUB: S. & T., 7/9 & 7/16/2015)

PROOF OF PUBLICATION
(2015.5 C.C.P.)

This space is for the County Clerk's Filling Stamp

STATE OF CALIFORNIA
County of San Bernardino

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the:

DESERT TRAIL

a newspaper of general circulation, printed and published WEEKLY in the City of TWENTYNINE PALMS County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California,

under the date of 11/17, 1938.

Case Number 43099 : that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-witt:

7/9, 7/16
all in the year 2015

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at: TWENTYNINE PALMS, California,

this **16TH** day of **JULY, 2015.**

Signature
MINDIE REDLIN

Proof of Publication
NOTICE OF AVAILABILITY

NOTICE OF AVAILABILITY OF DRAFT ENVIRONMENTAL ASSESSMENT FOR THE CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT THE MARINE AIR GROUND TASK FORCE TRAINING COMMAND, MARINE CORPS AIR GROUND COMBAT CENTER, TWENTYNINE PALMS, CALIFORNIA

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Comments may be submitted to: Naval Facilities Engineering Command Southwest, NAVFAC Southwest; Central IPT, Building 1, 3rd Floor; 937 North Harbor Drive; San Diego, California 92132. Attn: Ryan Maynard, Twentynine Palms Solar PV System EA Project Manager, Phone (619) 532-3728, email: ryan.maynard1@navy.mil. Public comments must be received by August 8, 2015 to be considered in the Final EA.

(PUB: S. & T., 7/9 & 7/16/2015)

Appendix B

Minimization, Mitigation, and Monitoring Implementation Plan and Minimization, Mitigation, and Monitoring Effectiveness Report

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Construction, Operation, and Decommissioning of a Solar Photovoltaic (PV) System
Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, CA
Minimization, Mitigation, and Monitoring IMPLEMENTATION PLAN (MMMIP)

Key: SCM = Special Conservation Measure required to be implemented as part of the Proposed Action; R = Required measure mandated by regulatory requirements. CAISO = California Independent System Operator; CPUC = California Public Utilities Commission; NREA = Natural Resources and Environmental Affairs; REPO = Renewable Energy Program Office; ROICC = Regional Officer in Charge of Construction; BR = Biological Resources; GR = Geological Resources; WR = Water Resources; CR = Cultural Resources; AQ = Air Quality; UT = Utilities; TBD=to be determined.

ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
CAISO-1	The private partner would obtain a power purchase agreement from the CPUC after completion of the NEPA process.	Table 1-1	Navy REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
CAISO-2	The private partner would obtain an Interconnection Agreement from the CAISO after completion of the NEPA process	Table 1-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 1	All components of the proposed solar PV site would be located at least 33 feet (10 meters) from the Combat Center's perimeter fence to meet Anti-terrorism Force Protection requirements.	2.2.1, Page 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 2	If a switching station is required by the local utility, it would be the responsibility of the private partner to acquire a lease for the land outside of the Combat Center boundary.	2.2.1, Page 2-3	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

Key: SCM = Special Conservation Measure required to be implemented as part of the Proposed Action; R = Required measure mandated by regulatory requirements. CAISO = California Independent System Operator; CPUC = California Public Utilities Commission; NREA = Natural Resources and Environmental Affairs; REPO = Renewable Energy Program Office; ROICC = Regional Officer in Charge of Construction; BR = Biological Resources; GR = Geological Resources; WR = Water Resources; CR = Cultural Resources; AQ = Air Quality; UT = Utilities; TBD=to be determined.

ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
Chapter 2, Measure 3	A chain link fence with barbed-wire outriggers in accordance with force protection standards would enclose the solar PV site to minimize the potential for unauthorized individuals to enter the area.	2.2.1, Page 2-3	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 4	In keeping with authority of 10 USC § 2667, outgrants (leases) under Model 2 shall provide for consideration (rent) to be paid, either in cash or in-kind, in an amount not less than the fair market value of the lease. Potential projects provided by lessee to apply towards rents as in-kind consideration will meet necessary environmental regulations and requirements under separate reporting. The primary financial benefit to the Combat Center is expected to be in the form of in-kind services that could include the construction of facilities, utility services, or real property maintenance services. Tangible, valuated, in-kind consideration that enhances DoN energy security posture is the primary preference of consideration negotiation. In-kind benefits that do not enhance energy security and cash consideration are allowed, but are less favorable to DoN. DoN and lessee shall coordinate during the course of due diligence and preliminary feasibility analysis to define and agree on tangible, valuated, energy security benefits on a project by project basis.	2.2.1.1, Page 2-4 and 10 USC § 2667	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
Chapter 2, Measure 5	All land transfer agreements for renewable energy will include the legal access to electricity generated by assets built on DoN land.	2.2.1.1, Page 2-4	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 6	The solar PV panels would be mounted on poles at a height sufficient to prevent damage during a 100-year flood event at the Mesquite Dry Lake.	2.2.1.2, Page 2-4	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 7	Soil could be built up, compacted, and stabilized (potentially with rock rip-rap) in a relatively small area to ensure the PV system's substation, inverters, and associated transformers remain at least two feet above the flood zone. Soil used for this purpose would be collected from the project area, and soil and topography would be managed in a manner that would ensure there is no net reduction in the project site's ability to retain stormwater.	2.2.1.2, Page 2-4	REPO NAVFAC to ensure inclusion in the Scope of Work Designer of Record to provide calculations NAVFAC to review calculations	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 8	The private partner would ensure that all lighting used temporarily during construction or permanently as part of the proposed project would comply with the City of Twentynine Palms lighting and night sky ordinances. Generally, this requires all outdoor lighting fixtures to be fully shielded or constructed so that light rays emitted	2.2.1.2, Page 2-4	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
	by the fixtures are not directed upward or onto an adjacent property.		ROICC 29 Palms to confirm compliance		
Chapter 2, Measure 9	A decommissioning plan would be prepared in accordance with DoN requirements. The plan would ensure that the project facilities would be decommissioned and removed and that the site would be restored to pre-construction conditions. Soils and impacted areas would be reclaimed to a level that would, at a minimum, support uses for the land consistent with pre-construction activities. The decommissioning and restoration process would likely involve the removal of above ground structures, possible grading, and restoration of topsoil.	2.2.1.4, Page 2-5	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 10	Temporary erosion and sedimentation control best management practices would be used during the decommissioning phase of the project.	2.2.1.4, Page 2-5	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 11	During decommissioning, pre-existing Combat Center power poles that were replaced with taller wooden poles to carry the PV energy, would be topped off (i.e., cutting off the power pole just above the existing cross arms and wires) and left in place. In so doing, the pole would be returned to the height it was at before the higher PV wires were installed. Steel poles would be removed by the private partner at the discretion of the Combat Center.	2.2.1.4, Page 2-5	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
Chapter 2, Measure 12	Water, environmentally-friendly and biodegradable polymeric stabilizers, and/or rock rip-rap would continue to be used to control dust during decommissioning activities. It is expected that as much as 15 acre-feet (4.9 million gallons) of water could be used during decommissioning from the same off-installation sources as identified for construction. To reduce impacts to groundwater, reclaimed water would be used as much as possible.	2.2.1.4, Page 2-5	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 13	All hazardous materials would be disposed of in accordance with applicable regulations at an appropriately accredited facility for the hazardous material(s). A decommissioning staging area would be delineated within the overall project area and all work would be done on-site.	2.2.1.4, Page 2-5	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 14	Following decommissioning activities, the DoN would certify that the land condition has been returned to its pre-project condition.	2.2.1.4, Page 2-6	REPO ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 2, Measure 15	All decommissioning activities would be conducted in compliance with all regulations applicable to conducting work activities at the Combat Center, and adherence to the environmental protection measures presented in Section 2.5, Summary of Environmental Consequences.	2.2.1.4, Page 2-6	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
Chapter 2, Measure 16	The transmission line portion of Alternative 3 is 2.9 miles (4.7 kilometers) long, 0.24 mile (0.38 kilometer) of which would be located outside of the Combat Center's boundary. This alternative would require the private partner to acquire an easement for the off-Combat Center portion of the transmission line. Separate environmental review would be required for development outside of the Combat Center.	2.2.3, Page 2-6	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-1	If construction or decommissioning activities occur during the recognized avian breeding season (1 February through 30 September), construction would occur in accordance with the Migratory Bird Treaty Act to avoid impacts to nesting migratory birds. Specifically, a biologist approved by the Combat Center's NREA office would survey the proposed project area for nesting birds prior to activities. If the biologist finds an active nest, construction workers would not directly or indirectly disturb the nest or adjacent areas until the biologist determines the nest is no longer in use.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply Private partner to hire an authorized biologist (approved by NREA) to confirm ROICC 29 Palms to confirm that a biologist was contracted, briefed by NREA, monitors, and confirms compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-2	The private partner would construct all transmission towers, poles, and lines in accordance with the guidelines in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006), or the most current version of the guidelines available at the time of construction, and in *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012).	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
SCM BR-3	An NREA-approved Authorized Biologist (AB) would be present during the initial groundbreaking during the construction and decommissioning phases and would conduct a clearance survey to ensure no tortoises are in the area. A tortoise exclusion fence would be constructed around the PV site and would remain in place for the duration of the construction and decommissioning phases. Temporary exclusion fencing would be built around the construction/ decommissioning area for each steel tower that would support the new transmission lines. The NREA-approved AB would inspect the fence line of the tortoise exclusion fencing at least once every two weeks and within 24 hours of any rain event.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-4	Per the Basewide Biological Opinion, if a tortoise is found in the action area during ground breaking activities, all ground breaking activities must halt until NREA is contacted and NREA processes the tortoise and authorizes ground-breaking activities to resume. Following construction/decommissioning, the temporary tortoise fencing would be removed.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance, including that a biologist was contracted, briefed by NREA, monitors, and confirms compliance Private partner to hire an Authorized Biologist (approved by NREA) to confirm	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
SCM BR-5	An NREA-approved AB would be "on-call" during construction in case a desert tortoise is encountered. The DoN and private partner would provide NREA the names and qualifications of AB candidates, with ultimate approval coming from the USFWS and NREA.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-6	The private partner would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fence is installed. The FCR would be responsible for overseeing compliance with biological resources conservation measures. The FCR would be on-site during all project activities. The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation of these measures. An NREA representative would make bi-weekly visits to ensure compliance.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-7	Before the start of construction activities, all personnel within the project work areas, including all participating agency employees, construction and maintenance personnel, and others who implement authorized actions, would receive worker training that includes the NREA-provided Environmental Awareness Training about desert tortoises, cultural resources, hazardous materials and hazardous wastes.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
SCM BR-8	All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project area to reduce the attractiveness of the area to common ravens (*Corvus corax*) and other predators. Any trash receptacles used for waste storage would be equipped with latching/locking lids. The FCR would be responsible for ensuring that trash is removed regularly from the project area, and that the trash containers are kept securely closed when not in use.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-9	Vehicle speed limits within the project area and along access roads would not exceed 20 miles (32 kilometers) per hour. Speed limits would be clearly marked by the private partner, and workers would be made aware of these speed limits. Vehicles parked outside of exclusion fencing would be inspected underneath for desert tortoises immediately before the vehicle is moved. If a desert tortoise is found under a vehicle, the vehicle would not be moved, NREA would be contacted immediately, and the tortoise would be monitored for its safety until NREA processes the tortoise.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
SCM BR-10	Should a dead or injured tortoise be located on-site at any time, the NREA would be notified immediately. In the case of an injury to a tortoise, NREA will contact USFWS immediately to decide the appropriate course of action. In the case of a dead tortoise, NREA will telephone and notify the USFWS within three days of the finding, and written notification within 15 days of the finding. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-11	The permanent security fence around the solar PV site would be contiguous to the permanent desert tortoise exclusion fence to prevent tortoises from burrowing under the fence.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-12	Monthly monitoring surveys would be conducted at the PV site by an NREA-approved biologist to assess use of the area by wildlife, vegetation changes, and potential bird/bat mortalities and/or injuries. In addition, project personnel working onsite would also record wildlife use of the project area. Results of the surveys and the data collected by project personnel would be provided to the NREA in quarterly reports for comments and recommendations to minimize impacts from continuing operations.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
SCM BR-13	If federally-listed species (e.g., desert tortoises) are observed in the project area during construction/decommissioning activities and/or during operation of the solar PV system, NREA will be notified immediately for further instructions, which may ultimately require USFWS instructions. The NREA would also be notified immediately if a dead or injured bird protected by the Migratory Bird Treaty Act is found on-site at any time, or if any incidents occur that may affect the health and safety of project personnel (e.g., locating a rattlesnake within the project area).	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-14	A revegetation and seeding plan approved by the NREA would be implemented following decommissioning activities to restore the site (including transmission lines) to pre-project conditions.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM BR-15	An NREA-approved biological monitor would survey the solar PV site for mammals, reptiles, and/or nesting birds prior to decommissioning activities. If nesting or denning animals are found to occur in the solar PV sites, they would be allowed to leave the sites on their own accord or would be passively relocated during the avian non-breeding season (October – January) prior to the start of decommissioning activities. If federally-listed species are found to occur in the solar PV site prior to the start of	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
	decommissioning activities, then activities will halt, NREA will be contacted, and the private partner would plan further action to avoid take of the listed species.				
SCM BR-16	The private partner would prepare and submit a Weed Management Plan to the NREA for review and approval. Once approved, the private partner would be responsible for implementing the Weed Management Plan.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM GR-1	The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM GR-2	A geotechnical study would be performed by professional civil or geotechnical engineers or engineering geologists licensed in the State of California and would provide design and construction recommendations, as appropriate, to reduce potential impacts associated with soil conditions and geologic hazards. The project would incorporate the recommendations identified by the geotechnical study and the proposed facilities associated with the project would be designed to accommodate for soil	Table 2-1	REPO NAVFAC to ensure inclusion in the Scope of work and confirm deliverable A/E Designer of Record to conduct investigation and provide report Private partner to confirm A/E's report	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
	conditions and geologic hazards.				
SCM WR-1	The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM WR-2	To minimize impacts within a 100-year flood zone, all excess soils and construction debris would be removed from the flood zone following construction. In addition, project facilities would be decommissioned and removed and the 100-year flood zone would be restored to pre-construction conditions at the end of the agreement term.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM WR-3	To reduce impacts to groundwater, reclaimed water would be used, as much as possible, for dust control.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM WR-4	To reduce water requirements for dust control, it is expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
			ROICC 29 Palms to confirm compliance		
SCM WR-5	Transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM CR-1	The private partner would be responsible for preparing and implementing a Monitoring and Discovery Plan prior to construction, and archaeological monitoring would be required during all ground disturbing activities. A monitoring summary report would be completed at the end of the monitoring.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM CR-2	If cultural resources are found during ground-disturbing activities associated with this project, work would stop and the NREA Cultural Resources Manager would be contacted immediately.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
SCM AQ-1	Proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within design standards.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-2	Construction vehicle engines (non-road diesel engines) would conform to U.S. Environmental Protection Agency Tier 4 emission standards, when applicable.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-3	In conjunction with measure AQ-16, the private partner would prepare a Dust Abatement Plan/Health and Safety Plan related to airborne dust that would be approved by the Combat Center, the San Bernardino County Department of Public Health, and the Mojave Desert Air Quality Management District (MDAQMD) prior to commencing any construction activities. This plan would cover all project phases (construction, operations, and decommissioning) as well as abandonment post-decommissioning and would include, but not be limited to, the avoidance and minimization measures listed below. The Dust Abatement Plan/Health and Safety Plan would also be reviewed and updated as needed to prevent dust from leaving the site.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
SCM AQ-4	The project would minimize the amount of ground disturbance to the greatest extent possible (e.g., by designing the project to minimize both grading and trenching).	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-5	Water trucks or sprinkler systems would be used in quantities sufficient to prevent airborne dust from leaving the site. Watering frequency would be increased whenever wind speeds exceed 15 mph. Non-potable water would be used whenever possible.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-6	All dirt stockpile areas would be covered (e.g., with tarps.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-7	Exposed ground areas that are planned to be reworked at dates more than one month after initial grading may be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established. All disturbed soil areas not subject to revegetation would be stabilized using chemical soil binders (e.g., polymeric stabilizers), jute netting, or other	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
	methods approved in advance by the MDAQMD. Specific details would be provided in the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3). Chemical soil binders, jute netting, and any other methods implemented to control dust would be inspected and maintained per the manufacturer's recommendations throughout all project phases (construction, operations, and decommissioning) to ensure efficacy of the dust control method is maintained. In addition, inspection and maintenance activities would also be performed after any substantial events (e.g., large wind, dust, or rain storms) or as requested by the Combat Center.				
SCM AQ-8	Paving (e.g., for roadways, driveways, sidewalks, etc.), would be completed as soon as possible. In addition, building pads would be laid as soon as possible after grading unless seeding or soil binders are used (see measure AQ-7).	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
SCM AQ-9	Vehicle speed for all construction/decommissioning vehicles would not exceed 15 mph on any unpaved (i.e., without asphalt) surface at the project site.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-10	All trucks hauling dirt, sand, soil, or other loose materials would be either covered or loaded such that at least 2 feet of freeboard (minimum vertical distance between top of load and top of trailer) is maintained in accordance with California Vehicle Code Section 23114.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-11	Either wheel washers would be installed where vehicles enter or exit unpaved roads from or onto streets, or trucks and equipment leaving the site would be washed.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-12	Streets would be swept at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water would be used where feasible.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
SCM AQ-13	All measures to reduce fugitive dust and Valley Fever exposure would be shown on grading and building plans.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-14	The private partner would designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent (%) opacity, and prevent transport of dust offsite. Monitors would have the authority, and responsibility, to cease construction/decommissioning activities (particularly soil-disturbing activities) during conditions that prevent adequate dust control (e.g., heavy wind or dust storms). Their duty hours would include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons would be provided to the Combat Center and the MDAQMD Compliance Division prior to the start of any grading, earthwork or demolition.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-15	The private partner would ensure more water truck capacity and faster response to dusty conditions when needed. When visible dust exceeds 20% opacity on-site, or water trucks cannot sufficiently dampen the soil to suppress the dust, workers would be moved out of the	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
	area and/or additional employee protection would be provided. Note that the 20% opacity criteria may not provide sufficient worker protection as infection may be caused by inhalation of a very low number of spores, e.g., 10 or less.		29 Palms PWD to confirm compliance		
SCM AQ-16	While developing the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3), the private partner would consult with the San Bernardino County Public Health Department and the California Occupational Safety and Health Administration (Cal/OSHA) to ensure that it minimizes the potential for exposure to Valley Fever. Avoidance and minimization measures included in the Plan would be based on the best available standards at the time of review. The Plan would also include a program to evaluate the potential for exposure to Valley Fever from all project phases (construction, operations, decommissioning) and abandonment post-decommissioning and would include a protocol for monitoring ambient air for spores that cause Valley Fever if Valley Fever is found within the project area (see AQ-17).	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM AQ-17	Prior to commencing construction activities, the private partner would test the proposed project's soil for the fungus that causes Valley Fever to more clearly characterize the potential level of risk that the site might contain Valley Fever. Soil testing would be performed in the location(s) on the site identified by the subject matter experts as most likely to contain spores		REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
	that cause Valley Fever. The testing protocol would be based on the best available standards at the time of testing. In any event, the testing protocol would be one that is reliable; as of September 2015, there are two protocols that meet this criteria (Barker 2015, Lauer 2015). If the result of any test sample is positive for Valley Fever, sensors would be utilized during project construction to monitor ambient air conditions at and around the project site for spores that cause Valley Fever. In conjunction with AQ-16, the protocol (e.g., the number of sensors, the type of sensors, and their placement) for this monitoring effort would be described in the Dust Abatement Plan/Health and Safety Plan.				
SCM AQ-18	Prior to commencing construction activities, the private partner would provide funding for offsite dust control/mitigation for expected dust emissions during the operational phase. Specifically, the private partner would develop and implement or fund a program for offsite mitigation of fugitive dust from existing sources at the Combat Center and surrounding communities (e.g., the City of Twentynine Palms) and would initiate this program such that the emission reduction project(s) are in place prior to commencing operation. Specific strategies and actual funding levels would be refined based on the final engineering and emission levels remaining after implementation of the operational portion of the Dust Abatement Plan/Health and Safety Plan. The private partner	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
	would provide the Combat Center and San Bernardino County with evidence of an MDAQMD-approved strategy, as well as evidence of complete funding, prior to commencing construction activities.				
SCM UT-1	To avoid design and construction conflicts with the Combat Center's internal utility network, a utility investigation would be conducted to obtain the exact depth and location of underground utilities (i.e., natural gas lines, wastewater lines, potable and non-potable water lines).	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply 29 Palms PWD to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM UT-2	Special consideration would be required for transmission pole replacement at the front of the wastewater detention ponds and during PV site construction near the existing overhead line. For example, appropriately low construction equipment and safety measures would be utilized as needed.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM UT-3	To avoid interrupting Combat Center operations, work along the entire transmission line would be completed while the existing power lines are operational, or "hot."	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
SCM UT-4	The private partner would be responsible for: • adhering to conditions for application processes established by the California Independent System Operators, Southern California Edison (SCE) (the local electrical utility), Federal Energy Regulatory Commission, and other entities, which include an application for interconnection, a systems impact study, and a facility study; and • off-installation utility upgrades required by the local utility for carrying the PV power, if necessary.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
SCM UT-5	The private partner would be responsible for obtaining the necessary water. It is expected that this water would come from one or more of the three nearby water districts (Twentynine Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District). The private partner would also be responsible for shipping the water to the project site via truck.	Table 2-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 1	The Proposed Action would not affect airspace because it would have an anti-reflective coating that would improve light absorption and reduce or eliminate the potential for glint and glare impacts.	Ch 3, Page 3-1	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
Chapter 3, Measure 2	The Proposed Action would be designed such that the adjacent on-installation running track would not be affected.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 3	If either Alternative 2 or Alternative 3 were selected, the transmission line would be designed to span Installation Restoration Site 10 to avoid ground disturbance in this area. In the unlikely event that avoiding the site is not feasible, any excavated soil would be tested for waste characteristics and disposed of off-site at an appropriate landfill based upon the test results.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 4	Any backfill would be from clean import fill that has been sampled to ensure that there are no contaminants.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
Chapter 3, Measure 5	To minimize the potential for environmental impacts, contractors would be required to keep their equipment in good condition to prevent accidental spills/releases of fuels and hydraulic fluid on the job site and would also be required to have spill kits onsite to quickly contain any spill that might occur.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 6	Contractors would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for the management of hazardous materials and hazardous waste, and to properly containerize, label, and dispose of all hazardous waste resulting from project activities.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 7	No polychlorinated biphenyls (PCBs) would be used in the construction of any of the project components (e.g., pole line transformers and switchgear) in the new switching/metering station on Berkeley Avenue.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 8	Equipment maintenance personnel would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for hazardous waste.	Ch 3, Page 3-2	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
Chapter 3, Measure 9	The private partner would prepare and submit a traffic plan to the Combat Center's traffic engineer for review and approval to ensure that the temporary increase in traffic associated with worker trips and the delivery of equipment, materials, and water during construction and decommissioning activities, as well as worker and water truck trips during operations, would result in no more than a minor impact to traffic.	Ch 3, Page 3-4	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 10	Construction and decommissioning noise generated would be limited to regular working hours.	Ch 3, Page 3-4	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 11	Other project elements would be designed and constructed in accordance with the appropriate industry standards, including established engineering and construction practices and methods.	3.2.4.1, Page 3-18	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 12	The portion of the transmission line alignment along Mesquite Dry Lake under Alternative 2 and Alternative 3 would be designed to accommodate the poor drainage and high shrink-swell potential of the soils in Mesquite Dry Lake.	3.2.4.2, 3.2.4.3, Page 3-19	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
			ROICC 29 Palms to confirm compliance		
Chapter 3, Measure 13	Replacement of existing power poles and installing new steel poles would avoid drainages to the greatest extent feasible.	3.3.4.1, Page 3-22	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 14	Subsequent to possible minor alterations of streambeds, restoration to approximate pre-project conditions would occur, such that there would be no substantial alteration to the bed, banks, or natural functions of these surface water features.	3.3.4.1, Page 3-23	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 15	As required by Executive Order 11988, as amended, the Combat Center would give public notice that a PV farm would be partially constructed within the 100-year flood zone of Mesquite Dry Lake.	3.3.4.1, Page 3-23	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 16	Under Alternative 3, the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary.	3.3.4.3, Page 3-24	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
			ROICC 29 Palms to confirm compliance		
Chapter 3, Measure 17	If the project boundaries change for any reason, further archaeological work may be required and the NREA Cultural Resources Manager must be consulted.	Ch 3, Page 3-29	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 18	Any cut and fill would remain on site.	Ch 3, Page 3-34	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
Chapter 3, Measure 19	Under Alternative 1, areas at the front of the wastewater detention ponds, parallel to Del Valle Road, would require special consideration to avoid undermining the detention pond berms during any pole replacement activities.	Ch 3, Page 3-39	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
R1	The Contractor would be required to submit Notification of Demolition/Renovation forms to the Mojave Desert Air Quality Management District (MDAQMD) and to the USEPA before the construction of the proposed PV site. The application packages must be reviewed and approved by the NREA Air Resources Manager before being submitted to the MDAQMD and the USEPA. Contact NREA for Application Package details. Construction activities shall be in accordance with MDAQMD Regulation III and all applicable state and federal rules regarding asbestos.	40 CFR Part 61, Subpart M	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R2	If a stand-by generator is required, the Contractor would be required to obtain an Authority to Construct permit from the MDAQMD before the construction of the proposed PV site. The application package must be reviewed and approved by the NREA Air Resources Manager before being submitted to the MDAQMD. Contact NREA for Application Package details.	Clean Air Act (42 USC §§ 7401-7671q)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to submit documentation to reporting agencies ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R3	Method of collection and disposal of ACM will be consistent with all health, safety, and environmental requirements.	40 CFR Part 61, Subpart M	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
R4	The construction contractor would develop a fugitive dust control plan before construction.	Clean Air Act (42 USC §§ 7401-7671q)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R5	Manage grading to maximize the capture and retention of on-site runoff by creating perimeter ditches, trenches, siltation ponds, or similar depressions.	Clean Water Act (33 USC §§ 1251-1387)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R6	During construction, temporary silt fencing would be installed around the perimeter of the work area.	Clean Water Act (33 USC §§ 1251-1387)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R7	Implement soil-tracking BMPs to limit off-site transport of sediment from the construction areas by implementing tire-cleaning measures such as stabilized construction entrance/exit designs (e.g., metal corrugated shaker plates, gravel strips, and/or wheel-washing sites) at access points.	Clean Water Act, Storm Water Permit 2009-0009	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***EA Section (or Legal Driver)***	***Responsible Organization***	***Funding***	
				Source	***Estimated Cost***
R8	Implement material and waste management programs during construction, such as solid, sanitary, septic, hazardous, contaminated soil, concrete, and construction waste management; spill prevention; appropriate material delivery and storage; employee training; dust control; and vehicle and equipment cleaning, maintenance, and fueling. Each of these programs would address proper secondary containment requirements, spill prevention and protection, structural material storage needs, proper concrete washout design and containment, perimeter and surface protection for laydown and maintenance areas, and relaying all such requirements to construction staff. Storage, use, and disposal of hazardous materials would be conducted in accordance with local, state, and federal guidelines pertaining to handling, storage, transport, disposal, and use of such materials.	Clean Water Act (33 USC §§ 1251-1387)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R9	Inspect/maintain all erosion and sediment control measures to ensure proper integrity and function during the entire construction period. Inspect all stabilization and structural controls at least monthly and after any significant storm event for the duration of the construction activities; any damage would be repaired, and the controls would be maintained for optimum performance. Maintain access to these sites during wet weather.	Clean Water Act (33 USC §§ 1251-1387)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

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				Source	***Estimated Cost***
R10	Implement an operations and maintenance program to ensure the continued effectiveness of post-construction BMPs once construction is completed. Maintenance activities would vary depending on the BMPs in place but would include the following: • Xeriscape as needed to minimize the potential for erosion. Maintain as needed. • Repair erosion areas and stabilize repairs with additional erosion control protection.	Clean Water Act (33 USC §§ 1251-1387)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply (for 1 year warranty period) ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R11	The construction contractor would document the area that has been permanently stabilized by concrete and/or asphalt after construction. In accordance with MDAQMD Regulation 14 (1400-1404), NREA may elect to apply for and register Emission Reduction Credits for this area, to bank for future potential use at the Combat Center.	Clean Air Act (42 USC §§ 7401-7671q)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private Partner to comply ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD
R12	Monitor stormwater drainage to ensure existing culverts are sufficient, if applicable, or if a detention area is needed.	Clean Water Act (33 USC §§ 1251-1387)	REPO NAVFAC to ensure inclusion in the Plans and spec's Private partner to comply / if rain event occurs during construction phase ROICC 29 Palms to confirm compliance	Alts 1, 2, and 3: TBD	Alts 1, 2, and 3: TBD

Construction, Operation, and Decommissioning of a Solar Photovoltaic (PV) System
Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center, Twentynine Palms, CA
Minimization, Mitigation, and Monitoring EFFECTIVENESS REPORT (MMMER)

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ID #	***Avoidance and Impact Minimization Measures/Special Conservation Measures***	***Project Performance Standard Achieved?***	***Corrective Action Taken***	***Funding - cont. from MMMIP***		***Verification of Compliance with Performance Standards***	
				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
CAISO-1	The private partner would obtain a power purchase agreement from the CPUC after completion of the NEPA process.					Verified by: Date:	Verified by: Date:
CAISO-2	The private partner would obtain an Interconnection Agreement from the CAISO after completion of the NEPA process					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 1	All components of the proposed solar PV site would be located at least 33 feet (10 meters) from the Combat Center's perimeter fence to meet Anti-terrorism Force Protection requirements.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 2	If a switching station is required by the local utility, it would be the responsibility of the private partner to acquire a lease for the land outside of the Combat Center boundary.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 3	A chain link fence with barbed-wire outriggers in accordance with force protection standards would enclose the solar PV site to minimize the potential for unauthorized individuals to enter the area.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 4	In keeping with authority of 10 USC § 2667, outgrants (leases) under Model 2 shall provide for consideration (rent) to be paid, either in cash or in-kind, in an amount not less than the fair market value of the lease. Potential projects provided by lessee to apply towards rents as in-kind consideration will meet necessary environmental regulations					Verified by: Date:	Verified by: Date:

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				(Project)	(Companion Project)	Project	Companion Project
	and requirements under separate reporting. The primary financial benefit to the Combat Center is expected to be in the form of in-kind services that could include the construction of facilities, utility services, or real property maintenance services. Tangible, valuated, in-kind consideration that enhances DoN energy security posture is the primary preference of consideration negotiation. In-kind benefits that do not enhance energy security and cash consideration are allowed, but are less favorable to DoN. DoN and lessee shall coordinate during the course of due diligence and preliminary feasibility analysis to define and agree on tangible, valuated, energy security benefits on a project by project basis.						
Chapter 2, Measure 5	All land transfer agreements for renewable energy will include the legal access to electricity generated by assets built on DoN land.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 6	The solar PV panels would be mounted on poles at a height sufficient to prevent damage during a 100-year flood event at the Mesquite Dry Lake.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 7	Soil could be built up, compacted, and stabilized (potentially with rock rip-rap) in a relatively small area to ensure the PV system's substation, inverters, and associated transformers remain at least					Verified by: Date:	Verified by: Date:

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				(Project)	(Companion Project)	Project	Companion Project
	two feet above the flood zone. Soil used for this purpose would be collected from the project area, and soil and topography would be managed in a manner that would ensure there is no net reduction in the project site's ability to retain stormwater.						
Chapter 2, Measure 8	The private partner would ensure that all lighting used temporarily during construction or permanently as part of the proposed project would comply with the City of Twentynine Palms lighting and night sky ordinances. Generally, this requires all outdoor lighting fixtures to be fully shielded or constructed so that light rays emitted by the fixtures are not directed upward or onto an adjacent property.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 9	A decommissioning plan would be prepared in accordance with DoN requirements. The plan would ensure that the project facilities would be decommissioned and removed and that the site would be restored to pre-construction conditions. Soils and impacted areas would be reclaimed to a level that would, at a minimum, support uses for the land consistent with pre-construction activities. The decommissioning and restoration process would likely involve the removal of above ground structures, possible grading, and restoration of topsoil.					Verified by: Date:	Verified by: Date:

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				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
Chapter 2, Measure 10	Temporary erosion and sedimentation control best management practices would be used during the decommissioning phase of the project.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 11	During decommissioning, pre-existing Combat Center power poles that were replaced with taller wooden poles to carry the PV energy, would be topped off (i.e., cutting off the power pole just above the existing cross arms and wires) and left in place. In so doing, the pole would be returned to the height it was at before the higher PV wires were installed. Steel poles would be removed by the private partner at the discretion of the Combat Center.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 12	Water, environmentally-friendly and biodegradable polymeric stabilizers, and/or rock rip-rap would continue to be used to control dust during decommissioning activities. It is expected that as much as 15 acre-feet (4.9 million gallons) of water could be used during decommissioning from the same off-installation sources as identified for construction. To reduce impacts to groundwater, reclaimed water would be used as much as possible.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 13	All hazardous materials would be disposed of in accordance with applicable regulations at an appropriately accredited facility for the					Verified by: Date:	Verified by: Date:

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				(Project)	(Companion Project)	Project	Companion Project
	hazardous material(s). A decommissioning staging area would be delineated within the overall project area and all work would be done on-site.						
Chapter 2, Measure 14	Following decommissioning activities, the DoN would certify that the land condition has been returned to its pre-project condition.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 15	All decommissioning activities would be conducted in compliance with all regulations applicable to conducting work activities at the Combat Center, and adherence to the environmental protection measures presented in Section 2.5, Summary of Environmental Consequences.					Verified by: Date:	Verified by: Date:
Chapter 2, Measure 16	The transmission line portion of Alternative 3 is 2.9 miles (4.7 kilometers) long, 0.24 mile (0.38 kilometer) of which would be located outside of the Combat Center's boundary. This alternative would require the private partner to acquire an easement for the off-Combat Center portion of the transmission line. Separate environmental review would be required for development outside of the Combat Center.						
SCM BR-1	If construction or decommissioning activities occur during the recognized avian breeding season (1 February through 30 September), construction would occur in accordance with the Migratory Bird Treaty Act to avoid						

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				(Project)	(Companion Project)	Project	Companion Project
	impacts to nesting migratory birds. Specifically, a biologist approved by the Combat Center's NREA office would survey the proposed project area for nesting birds prior to activities. If the biologist finds an active nest, construction workers would not directly or indirectly disturb the nest or adjacent areas until the biologist determines the nest is no longer in use.						
SCM BR-2	The private partner would construct all transmission towers, poles, and lines in accordance with the guidelines in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006), or the most current version of the guidelines available at the time of construction, and in *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012).						
SCM BR-3	An NREA-approved Authorized Biologist (AB) would be present during the initial groundbreaking during the construction and decommissioning phases and would conduct a clearance survey to ensure no tortoises are in the area. A tortoise exclusion fence would be constructed around the PV site and would remain in place for the duration of the construction and decommissioning phases. Temporary exclusion fencing						

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				(Project)	(Companion Project)	Project	Companion Project
	would be built around the construction/ decommissioning area for each steel tower that would support the new transmission lines. The NREA-approved AB would inspect the fence line of the tortoise exclusion fencing at least once every two weeks and within 24 hours of any rain event.						
SCM BR-4	Per the Basewide Biological Opinion, if a tortoise is found in the action area during ground breaking activities, all ground breaking activities must halt until NREA is contacted and NREA processes the tortoise and authorizes ground-breaking activities to resume. Following construction/decommissioning, the temporary tortoise fencing would be removed.						
SCM BR-5	An NREA-approved AB would be "on-call" during construction in case a desert tortoise is encountered. The DoN and private partner would provide NREA the names and qualifications of AB candidates, with ultimate approval coming from the USFWS and NREA.						
SCM BR-6	The private partner would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fence is installed. The FCR would be responsible for overseeing compliance with biological resources conservation measures. The FCR would be on-site during all project activities.						

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				(Project)	(Companion Project)	Project	Companion Project
	The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation of these measures. An NREA representative would make bi-weekly visits to ensure compliance.						
SCM BR-7	Before the start of construction activities, all personnel within the project work areas, including all participating agency employees, construction and maintenance personnel, and others who implement authorized actions, would receive worker training that includes the NREA-provided Environmental Awareness Training about desert tortoises, cultural resources, hazardous materials and hazardous wastes.						
SCM BR-8	All trash and food items generated by construction and maintenance activities would be promptly contained and regularly removed from the project area to reduce the attractiveness of the area to common ravens (*Corvus corax*) and other predators. Any trash receptacles used for waste storage would be equipped with latching/locking lids. The FCR would be responsible for ensuring that trash is removed regularly from the project area, and that the trash containers are kept securely closed when not in use.						

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				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
SCM BR-9	Vehicle speed limits within the project area and along access roads would not exceed 20 miles (32 kilometers) per hour. Speed limits would be clearly marked by the private partner, and workers would be made aware of these speed limits. Vehicles parked outside of exclusion fencing would be inspected underneath for desert tortoises immediately before the vehicle is moved. If a desert tortoise is found under a vehicle, the vehicle would not be moved, NREA would be contacted immediately, and the tortoise would be monitored for its safety until NREA processes the tortoise.						
SCM BR-10	Should a dead or injured tortoise be located on-site at any time, the NREA would be notified immediately. In the case of an injury to a tortoise, NREA will contact USFWS immediately to decide the appropriate course of action. In the case of a dead tortoise, NREA will telephone and notify the USFWS within three days of the finding, and written notification within 15 days of the finding. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information.						

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				(Project)	(Companion Project)	Project	Companion Project
SCM BR-11	The permanent security fence around the solar PV site would be contiguous to the permanent desert tortoise exclusion fence to prevent tortoises from burrowing under the fence.						
SCM BR-12	Monthly monitoring surveys would be conducted at the PV site by an NREA-approved biologist to assess use of the area by wildlife, vegetation changes, and potential bird/bat mortalities and/or injuries. In addition, project personnel working onsite would also record wildlife use of the project area. Results of the surveys and the data collected by project personnel would be provided to the NREA in quarterly reports for comments and recommendations to minimize impacts from continuing operations.						
SCM BR-13	If federally-listed species (e.g., desert tortoises) are observed in the project area during construction/ decommissioning activities and/or during operation of the solar PV system, NREA will be notified immediately for further instructions, which may ultimately require USFWS instructions. The NREA would also be notified immediately if a dead or injured bird protected by the Migratory Bird Treaty Act is found on-site at any time, or if any incidents occur that may affect the health and safety of project personnel (e.g., locating a rattlesnake within the						

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				(Project)	(Companion Project)	Project	Companion Project
	project area).						
SCM BR-14	A revegetation and seeding plan approved by the NREA would be implemented following decommissioning activities to restore the site (including transmission lines) to pre-project conditions.						
SCM BR-15	An NREA-approved biological monitor would survey the solar PV site for mammals, reptiles, and/or nesting birds prior to decommissioning activities. If nesting or denning animals are found to occur in the solar PV sites, they would be allowed to leave the sites on their own accord or would be passively relocated during the avian non-breeding season (October – January) prior to the start of decommissioning activities. If federally-listed species are found to occur in the solar PV site prior to the start of decommissioning activities, then activities will halt, NREA will be contacted, and the private partner would plan further action to avoid take of the listed species.						
SCM BR-16	The private partner would prepare and submit a Weed Management Plan to the NREA for review and approval. Once approved, the private partner would be responsible for implementing the Weed Management Plan.						

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				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
SCM GR-1	The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be utilized to reduce erosion during grading and construction activities.						
SCM GR-2	A geotechnical study would be performed by professional civil or geotechnical engineers or engineering geologists licensed in the State of California and would provide design and construction recommendations, as appropriate, to reduce potential impacts associated with soil conditions and geologic hazards. The project would incorporate the recommendations identified by the geotechnical study and the proposed facilities associated with the project would be designed to accommodate for soil conditions and geologic hazards.						
SCM WR-1	The private partner would populate the Combat Center's SWPPP prior to any construction activities and adhere to the Combat Center's requirements related to stormwater pollution prevention and stormwater controls. The standard erosion control measures as identified in the Combat Center's SWPPP would be						

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				(Project)	(Companion Project)	Project	Companion Project
	utilized to reduce erosion during grading and construction activities.						
SCM WR-2	To minimize impacts within a 100-year flood zone, all excess soils and construction debris would be removed from the flood zone following construction. In addition, project facilities would be decommissioned and removed and the 100-year flood zone would be restored to pre-construction conditions at the end of the agreement term.						
SCM WR-3	To reduce impacts to groundwater, reclaimed water would be used, as much as possible, for dust control.						
SCM WR-4	To reduce water requirements for dust control, it is expected that environmentally-friendly, biodegradable polymeric stabilizers and/or rock rip-rap would be used to stabilize unpaved roads.						
SCM WR-5	Transmission line poles and PV site posts would be designed such that they would not affect, nor would they be affected by, groundwater.						
SCM CR-1	The private partner would be responsible for preparing and implementing a Monitoring and Discovery Plan prior to construction, and archaeological monitoring would be required during all ground disturbing activities. A monitoring summary report would be completed at the end of the						

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ID #	Avoidance and Impact Minimization Measures/Special Conservation Measures	Project Performance Standard Achieved?	Corrective Action Taken	Funding - cont. from MMMIP Actual Cost		Verification of Compliance with Performance Standards	
				(Project)	(Companion Project)	Project	Companion Project
	monitoring.						
SCM CR-2	If cultural resources are found during ground-disturbing activities associated with this project, work would stop and the NREA Cultural Resources Manager would be contacted immediately.						
SCM AQ-1	Proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within design standards.						
SCM AQ-2	Construction vehicle engines (non-road diesel engines) would conform to U.S. Environmental Protection Agency Tier 4 emission standards, when applicable.						
SCM AQ-3	In conjunction with measure AQ-16, the private partner would prepare a Dust Abatement Plan/Health and Safety Plan related to airborne dust that would be approved by the Combat Center, the San Bernardino County Department of Public Health, and the Mojave Desert Air Quality Management District (MDAQMD) prior to commencing any construction activities. This plan would cover all project phases (construction, operations, and decommissioning) as well as abandonment post-decommissioning and would include, but not be limited to, the avoidance and minimization measures listed below. The Dust Abatement Plan/Health and Safety Plan would also be reviewed and						

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				(Project)	(Companion Project)	Project	Companion Project
	updated as needed to prevent dust from leaving the site.						
SCM AQ-4	The project would minimize the amount of ground disturbance to the greatest extent possible (e.g., by designing the project to minimize both grading and trenching).						
SCM AQ-5	Water trucks or sprinkler systems would be used in quantities sufficient to prevent airborne dust from leaving the site. Watering frequency would be increased whenever wind speeds exceed 15 mph. Non-potable water would be used whenever possible.						
SCM AQ-6	All dirt stockpile areas would be covered (e.g., with tarps.						
SCM AQ-7	Exposed ground areas that are planned to be reworked at dates more than one month after initial grading may be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established. All disturbed soil areas not subject to revegetation would be stabilized using chemical soil binders (e.g., polymeric stabilizers), jute netting, or other methods approved in advance by the MDAQMD. Specific details would be provided in the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3). Chemical soil binders, jute netting, and any other methods implemented to control dust would be inspected and maintained per the						

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				(Project)	(Companion Project)	Project	Companion Project
	manufacturer's recommendations throughout all project phases (construction, operations, and decommissioning) to ensure efficacy of the dust control method is maintained. In addition, inspection and maintenance activities would also be performed after any substantial events (e.g., large wind, dust, or rain storms) or as requested by the Combat Center.						
SCM AQ-8	Paving (e.g., for roadways, driveways, sidewalks, etc.), would be completed as soon as possible. In addition, building pads would be laid as soon as possible after grading unless seeding or soil binders are used (see measure AQ-7).						
SCM AQ-9	Vehicle speed for all construction/ decommissioning vehicles would not exceed 15 mph on any unpaved (i.e., without asphalt) surface at the project site.						
SCM AQ-10	All trucks hauling dirt, sand, soil, or other loose materials would be either covered or loaded such that at least 2 feet of freeboard (minimum vertical distance between top of load and top of trailer) is maintained in accordance with California Vehicle Code Section 23114.						
SCM AQ-11	Either wheel washers would be installed where vehicles enter or exit unpaved roads from or onto streets, or trucks and equipment leaving the site would be washed.						

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				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
SCM AQ-12	Streets would be swept at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water would be used where feasible.						
SCM AQ-13	All measures to reduce fugitive dust and Valley Fever exposure would be shown on grading and building plans.						
SCM AQ-14	The private partner would designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20 percent (%) opacity, and prevent transport of dust offsite. Monitors would have the authority, and responsibility, to cease construction/decommissioning activities (particularly soil-disturbing activities) during conditions that prevent adequate dust control (e.g., heavy wind or dust storms). Their duty hours would include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons would be provided to the Combat Center and the MDAQMD Compliance Division prior to the start of any grading, earthwork or demolition.						

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SCM AQ-15	The private partner would ensure more water truck capacity and faster response to dusty conditions when needed. When visible dust exceeds 20% opacity on-site, or water trucks cannot sufficiently dampen the soil to suppress the dust, workers would be moved out of the area and/or additional employee protection would be provided. Note that the 20% opacity criteria may not provide sufficient worker protection as infection may be caused by inhalation of a very low number of spores, e.g., 10 or less.						
SCM AQ-16	While developing the Dust Abatement Plan/Health and Safety Plan (see measure AQ-3), the private partner would consult with the San Bernardino County Public Health Department and the California Occupational Safety and Health Administration (Cal/OSHA) to ensure that it minimizes the potential for exposure to Valley Fever. Avoidance and minimization measures included in the Plan would be based on the best available standards at the time of review. The Plan would also include a program to evaluate the potential for exposure to Valley Fever from all project phases (construction, operations, decommissioning) and abandonment post-decommissioning and would include a protocol for monitoring ambient air for spores that cause Valley						

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				(Project)	(Companion Project)	Project	Companion Project
	Fever if Valley Fever is found within the project area (see AQ-17).						
SCM AQ-17	Prior to commencing construction activities, the private partner would test the proposed project's soil for the fungus that causes Valley Fever to more clearly characterize the potential level of risk that the site might contain Valley Fever. Soil testing would be performed in the location(s) on the site identified by the subject matter experts as most likely to contain spores that cause Valley Fever. The testing protocol would be based on the best available standards at the time of testing. In any event, the testing protocol would be one that is reliable; as of September 2015, there are two protocols that meet this criteria (Barker 2015, Lauer 2015). If the result of any test sample is positive for Valley Fever, sensors would be utilized during project construction to monitor ambient air conditions at and around the project site for spores that cause Valley Fever. In conjunction with AQ-16, the protocol (e.g., the number of sensors, the type of sensors, and their placement) for this monitoring effort would be described in the Dust Abatement Plan/Health and Safety Plan.						

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SCM AQ-18	Prior to commencing construction activities, the private partner would provide funding for offsite dust control/mitigation for expected dust emissions during the operational phase. Specifically, the private partner would develop and implement or fund a program for offsite mitigation of fugitive dust from existing sources at the Combat Center and surrounding communities (e.g., the City of Twentynine Palms) and would initiate this program such that the emission reduction project(s) are in place prior to commencing operation. Specific strategies and actual funding levels would be refined based on the final engineering and emission levels remaining after implementation of the operational portion of the Dust Abatement Plan/Health and Safety Plan. The private partner would provide the Combat Center and San Bernardino County with evidence of an MDAQMD-approved strategy, as well as evidence of complete funding, prior to commencing construction activities.						
SCM UT-1	To avoid design and construction conflicts with the Combat Center's internal utility network, a utility investigation would be conducted to obtain the exact depth and location of underground utilities (i.e., natural gas lines, wastewater lines, potable and non-potable water lines).						

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				(Project)	(Companion Project)	Project	Companion Project
SCM UT-2	Special consideration would be required for transmission pole replacement at the front of the wastewater detention ponds and during PV site construction near the existing overhead line. For example, appropriately low construction equipment and safety measures would be utilized as needed.						
SCM UT-3	To avoid interrupting Combat Center operations, work along the entire transmission line would be completed while the existing power lines are operational, or "hot."						
SCM UT-4	The private partner would be responsible for: • adhering to conditions for application processes established by the California Independent System Operators, Southern California Edison (SCE) (the local electrical utility), Federal Energy Regulatory Commission, and other entities, which include an application for interconnection, a systems impact study, and a facility study; and • off-installation utility upgrades required by the local utility for carrying the PV power, if necessary.						
SCM UT-5	The private partner would be responsible for obtaining the necessary water. It is expected that this water would come from one or more of the three nearby water districts (Twentynine						

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	Palms Water District, Joshua Tree Water District, and/or the Hi-Desert Water District). The private partner would also be responsible for shipping the water to the project site via truck.						
Chapter 3, Measure 1	The Proposed Action would not affect airspace because it would have an anti-reflective coating that would improve light absorption and reduce or eliminate the potential for glint and glare impacts.						
Chapter 3, Measure 2	The Proposed Action would be designed such that the adjacent on-installation running track would not be affected.						
Chapter 3, Measure 3	If either Alternative 2 or Alternative 3 were selected, the transmission line would be designed to span Installation Restoration Site 10 to avoid ground disturbance in this area. In the unlikely event that avoiding the site is not feasible, any excavated soil would be tested for waste characteristics and disposed of off-site at an appropriate landfill based upon the test results.						
Chapter 3, Measure 4	Any backfill would be from clean import fill that has been sampled to ensure that there are no contaminants.						

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				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
Chapter 3, Measure 5	To minimize the potential for environmental impacts, contractors would be required to keep their equipment in good condition to prevent accidental spills/releases of fuels and hydraulic fluid on the job site and would also be required to have spill kits onsite to quickly contain any spill that might occur.						
Chapter 3, Measure 6	Contractors would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for the management of hazardous materials and hazardous waste, and to properly containerize, label, and dispose of all hazardous waste resulting from project activities.						
Chapter 3, Measure 7	No polychlorinated biphenyls (PCBs) would be used in the construction of any of the project components (e.g., pole line transformers and switchgear) in the new switching/metering station on Berkeley Avenue.						
Chapter 3, Measure 8	Equipment maintenance personnel would be required to comply with all federal, state, county, local, DoD, DoN, USMC, and Combat Center environmental requirements, including those for hazardous waste.						
Chapter 3, Measure 9	The private partner would prepare and submit a traffic plan to the Combat Center's traffic engineer for review and						

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				(Project)	(Companion Project)	Project	Companion Project
	approval to ensure that the temporary increase in traffic associated with worker trips and the delivery of equipment, materials, and water during construction and decommissioning activities, as well as worker and water truck trips during operations, would result in no more than a minor impact to traffic.						
Chapter 3, Measure 10	Construction and decommissioning noise generated would be limited to regular working hours.						
Chapter 3, Measure 11	Other project elements would be designed and constructed in accordance with the appropriate industry standards, including established engineering and construction practices and methods.						
Chapter 3, Measure 12	The portion of the transmission line alignment along Mesquite Dry Lake under Alternative 2 and Alternative 3 would be designed to accommodate the poor drainage and high shrink-swell potential of the soils in Mesquite Dry Lake.						
Chapter 3, Measure 13	Replacement of existing power poles and installing new steel poles would avoid drainages to the greatest extent feasible.						
Chapter 3, Measure 14	Subsequent to possible minor alterations of streambeds, restoration to approximate pre-project conditions would occur, such that there would be no substantial alteration to the bed, banks, or natural functions of these						

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				(Project)	(Companion Project)	Project	Companion Project
	surface water features.						
Chapter 3, Measure 15	As required by Executive Order 11988, as amended, the Combat Center would give public notice that a PV farm would be partially constructed within the 100-year flood zone of Mesquite Dry Lake.						
Chapter 3, Measure 16	Under Alternative 3, the transmission line alignment located outside of the Combat Center (along Berkeley Avenue) would be required to comply with the California General Construction Permit, including preparation of separate SWPPP for this portion, as necessary.						
Chapter 3, Measure 17	If the project boundaries change for any reason, further archaeological work may be required and the NREA Cultural Resources Manager must be consulted.						
Chapter 3, Measure 18	Any cut and fill would remain on site.						
Chapter 3, Measure 19	Under Alternative 1, areas at the front of the wastewater detention ponds, parallel to Del Valle Road, would require special consideration to avoid undermining the detention pond berms during any pole replacement activities.						

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				Actual Cost			
				(Project)	***(Companion Project)***	***Project***	***Companion Project***
R1	The Contractor would be required to submit Notification of Demolition/Renovation forms to the Mojave Desert Air Quality Management District (MDAQMD) and to the USEPA before the construction of the proposed PV site. The application packages must be reviewed and approved by the NREA Air Resources Manager before being submitted to the MDAQMD and the USEPA. Contact NREA for Application Package details. Construction activities shall be in accordance with MDAQMD Regulation III and all applicable state and federal rules regarding asbestos.						
R2	If a stand-by generator is required, the Contractor would be required to obtain an Authority to Construct permit from the MDAQMD before the construction of the proposed PV site. The application package must be reviewed and approved by the NREA Air Resources Manager before being submitted to the MDAQMD. Contact NREA for Application Package details.						
R3	Method of collection and disposal of ACM will be consistent with all health, safety, and environmental requirements.						

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				(Project)	(Companion Project)	Project	Companion Project
R4	The construction contractor would develop a fugitive dust control plan before construction.						
R5	Manage grading to maximize the capture and retention of on-site runoff by creating perimeter ditches, trenches, siltation ponds, or similar depressions.						
R6	During construction, temporary silt fencing would be installed around the perimeter of the work area.						
R7	Implement soil-tracking BMPs to limit off-site transport of sediment from the construction areas by implementing tire-cleaning measures such as stabilized construction entrance/exit designs (e.g., metal corrugated shaker plates, gravel strips, and/or wheel-washing sites) at access points.						
R8	Implement material and waste management programs during construction, such as solid, sanitary, septic, hazardous, contaminated soil, concrete, and construction waste management; spill prevention; appropriate material delivery and storage; employee training; dust control; and vehicle and equipment cleaning, maintenance, and fueling. Each of these programs would address proper secondary containment requirements, spill prevention and protection, structural material storage needs, proper concrete washout design and						

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	containment, perimeter and surface protection for laydown and maintenance areas, and relaying all such requirements to construction staff. Storage, use, and disposal of hazardous materials would be conducted in accordance with local, state, and federal guidelines pertaining to handling, storage, transport, disposal, and use of such materials.						
R9	Inspect/maintain all erosion and sediment control measures to ensure proper integrity and function during the entire construction period. Inspect all stabilization and structural controls at least monthly and after any significant storm event for the duration of the construction activities; any damage would be repaired, and the controls would be maintained for optimum performance. Maintain access to these sites during wet weather.						

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				(Project)	***(Companion Project)***	***Project***	***Companion Project***
R10	Implement an operations and maintenance program to ensure the continued effectiveness of post-construction BMPs once construction is completed. Maintenance activities would vary depending on the BMPs in place but would include the following: • Xeriscape as needed to minimize the potential for erosion. Maintain as needed. • Repair erosion areas and stabilize repairs with additional erosion control protection.						
R11	The construction contractor would document the area that has been permanently stabilized by concrete and/or asphalt after construction. In accordance with MDAQMD Regulation 14 (1400-1404), NREA may elect to apply for and register Emission Reduction Credits for this area, to bank for future potential use at the Combat Center.						
R12	Monitor stormwater drainage to ensure existing culverts are sufficient, if applicable, or if a detention area is needed.						

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Appendix C

Record of Non-Applicability and Air Quality Calculations

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RECORD OF NON-APPLICABILITY (RONA) FOR CLEAN AIR ACT CONFORMITY

Environmental Assessment for
Construction, Operation, and Decommissioning of a Solar Photovoltaic System at Marine Corps Air Ground Combat Center, Twentynine Palms, California

INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) published Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule, in the 30 November 1993 Federal Register (40 CFR Parts 6, 51, and 93). The U.S. Navy (DoN) published Interim Guidance on Compliance with the Clean Air Act (CAA) General Conformity Rule in the Marine Corps Order (MCO) P5090.2A, Change 3, dated 26 August 2013. These publications provide implementing guidance to document CAA conformity determination requirements.

Federal regulations state that no department, agency, or instrumentality of the federal government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the federal agency to determine whether a federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

The General Conformity Rule applies to Federal actions proposed within areas which are designated as either nonattainment or maintenance areas for a National Ambient Air Quality Standard (NAAQS) for any of the criteria pollutants (i.e., carbon monoxide [CO], ozone [O_3], sulfur dioxide [SO_2] nitrogen oxides [NO_X], suspended particulate matter between 2.5 and ten microns in diameter [PM_{10}] and less than 2.5 microns in diameter [$PM_{2.5}$], and lead [Pb]). Former nonattainment areas that have attained a NAAQS are designated as maintenance areas. Emissions of pollutants for which an area is in attainment are exempt from conformity analyses.

The Proposed Action would occur within the Mojave Desert Air Basin (MDAB) portion of San Bernardino County, and is in a severe-17 O_3 nonattainment area and a moderate PM_{10} nonattainment area. The MDAB attains the NAAQS for all other criteria pollutants. Therefore, only project emissions of O_3 (or its precursors, volatile organic compounds [VOCs] and NO_X), and PM_{10} are analyzed for conformity rule applicability.

The annual *de minimis* levels for this region are listed in Table C-1. Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels (40 CFR Part 1, § 51.853[b]).

Table C-1. *De minimis* Levels for Criteria Pollutants in the Mojave Desert Air Basin

Criteria Pollutant	*de minimis* Level (tons/year)
VOCs	25
NO_X	25
PM_{10}	100

PROPOSED ACTION

Action Proponent: Marine Corps Installations Command (MCICOM)

Location: Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California

Proposed Action Name: Environmental Assessment for Construction, Operation, and Decommissioning of a Solar Photovoltaic System at MCAGCC Twentynine Palms, California

Proposed Action Summary: This Environmental Assessment has been prepared to evaluate the potential environmental impacts resulting from the construction, operation, and decommissioning of a solar photovoltaic (PV) system at MCAGCC, Twentynine Palms, California. Under the Proposed Action, the DoN and a private partner would enter into an agreement to allow the private partner to use DoN land to construct, operate, and own the proposed solar PV system. The partner would sell the generated power to regional customers. The private partner would be responsible for maintenance, operation, and the eventual decommissioning of the solar PV system.

Air Emissions Summary: It has been estimated that all construction activities would be completed over the course of 2 years and would begin in fiscal year (FY) 2016. Operational air emissions refer to air emissions that may occur after the solar panels have been installed. Air emissions would primarily result from the use of employee vehicles traveling to the project site for maintenance and repair activities, water tank trucks being driven to and from the site for water deliveries (assumed to be 60 miles round-trip), and from travel on unpaved roads and surfaces. Routine maintenance and inspections would typically require one to two vehicles per event and would generate very minor emissions. Dust suppression methods would continue to be employed as necessary. Decommissioning activities are expected to occur over the course of two months and were assumed to occur in 2053.

Estimated emissions due to implementation of the Proposed Action are shown in Table C-2. The data presented in Table C-2 represent the estimated emissions with implementation of Alternatives 1, 2, or 3 since the construction footprint for Alternatives 2 or 3 are only marginally different than Alternative 1 and would not represent an appreciable change in estimated emissions. Based on the air quality analysis, the maximum estimated emissions would be below conformity *de minimis* threshold levels for the MDAB. On a region-wide scale, the use of solar PV panels would have beneficial air quality impacts because fossil fuels would not be used for the necessary electricity generation, resulting in fewer GHG and particulate matter emissions. For these reasons, no significant impact to air quality would occur.

Table C-2. Proposed Action Annual Construction and Decommissioning Emissions at the Combat Center with Evaluation of Conformity

Emission Source	Emissions (tons/year)					
	VOCs	NO_X	CO	SO_x	PM_{10}	$PM_{2.5}$
Proposed Action/Alternative 1 - Construction						
Year – 2016	0.26	1.58	7.89	0.02	0.72	0.29
Year – 2017	0.30	1.72	9.53	0.02	0.37	0.13
Proposed Action/Alternative 1 - Operation						
Yearly Emissions	0.31	0.10	0.22	0.0006	0.02	0.009
Proposed Action/Alternative 1 - Decommissioning						
Year – 2053	0.006	0.03	0.32	0.0006	0.02	0.004
Conformity *de minimis* Limits	25	25	NA	NA	100	NA
Exceeds Conformity *de minimis* Limits?	No	No	No	No	No	No

Note: NA = Not applicable.

Affected Air Basin: Mojave Desert Air Basin

Date RONA Prepared: 30 June 2015

RONA Prepared By: MCAGCC Twentynine Palms with direct support from Cardno

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

The MDAB is a severe-17 nonattainment area for the 8-hour O_3 NAAQS; VOCs and NO_X are precursors to the formation of O_3. The MDAB is also considered in moderate nonattainment for the PM_{10} NAAQS. Emissions associated with construction and operational activities for the Proposed Action were calculated using the California Emissions Estimation Model, which is the current air quality model for land use projects in California. Emissions were then compared with *de minimis* thresholds for the MDAB.

The USMC concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action. The emissions data supporting that conclusion are shown in Table C-2, which is a summary of the calculations, methodology, and data attached to this RONA. Therefore, the USMC concludes that further formal conformity determination procedures are not required.

RONA APPROVAL

To the best of my knowledge, the information presented in this RONA is correct and accurate, and I concur in the finding that the Proposed Action does not require a formal CAA conformity determination.

L.A. CRAPAROTTA
Major General, United States Marine Corps

2015 · 11 · 18
Date

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Combat Center Solar PV System – Construction and Operation

Mojave Desert Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	57.46	1000sqft	1.32	57,456.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	3			**Operational Year**	2016
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 - CalEEMod does not have a "utility" land use type as a default option, so "general light industry" was chosen as the closest appropriate option. Conservatively estimates 30,000 sqft of construction for a 57MW PV system (substation, switching station, metering station, transmission poles; assumes that PV panels are built offsite) + 27,456 sqft for transmission line (2.6 miles length x 2 ft buffer width).

Construction Phase - No demolition, paving, or architectural coating phases. Total construction is estimated to last two years. Assumed 4 months of site prep (1/1/2016 - 4/29/2016), 4 months of grading (5/2/2016 - 7/29/2016, 16 months of construction (8/2/2016 - 12/30/2017).

Off-road Equipment - Off-road equipment -Assumed 6 hrs per day per equipment type. Off-highway truck = water truck, Other construction equipment = pile drivers.

Grading - Conservatively assumes that the full project footprint would be graded & prepped (241 ac for PV footprint + 0.63 ac for transmission line corridor = 241.63 ac total). All cut/fill would remain onsite.

Operational Vehicle Trips - Reduced operational trip rate since the land use type of the Proposed Action is a utility project, not light industrial.

Combat Center Solar PV System – Construction and Operation

Mojave Desert Air Basin, Annual

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	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
Year	tons/yr										MT/yr					
2016	1.3352	13.4833	10.1830	0.0151	1.1924	0.6769	1.8693	0.4714	0.6259	1.0973	0.0000	1,367.9255	1,367.9255	0.2967	0.0000	1,374.1571
2017	1.5870	15.3051	12.2445	0.0183	0.3235	0.7928	1.1163	0.0874	0.7360	0.8234	0.0000	1,614.6930	1,614.6930	0.3474	0.0000	1,621.9891
Total	**2.9222**	**28.7884**	**22.4275**	**0.0334**	**1.5159**	**1.4697**	**2.9856**	**0.5588**	**1.3619**	**1.9207**	**0.0000**	**2,982.6185**	**2,982.6185**	**0.6442**	**0.0000**	**2,996.1462**

Mitigated Construction

	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
Year	tons/yr										MT/yr					
2016	0.2639	1.5762	7.8946	0.0151	0.6761	0.0404	0.7165	0.2500	0.0385	0.2885	0.0000	1,367.9243	1,367.9243	0.2967	0.0000	1,374.1559
2017	0.2981	1.7208	9.5279	0.0183	0.3235	0.0417	0.3652	0.0874	0.0400	0.1273	0.0000	1,614.6916	1,614.6916	0.3474	0.0000	1,621.9877
Total	**0.5620**	**3.2970**	**17.4224**	**0.0334**	**0.9997**	**0.0820**	**1.0817**	**0.3373**	**0.0784**	**0.4158**	**0.0000**	**2,982.6159**	**2,982.6159**	**0.6442**	**0.0000**	**2,996.1436**

	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**	**N20**	**CO2e**
Percent Reduction	**80.77**	**88.55**	**22.32**	**0.00**	**34.06**	**94.42**	**63.77**	**39.63**	**94.24**	**78.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Combat Center Solar PV System – Construction and Operation

Mojave Desert Air Basin, Annual

2.2 Overall Operational

Unmitigated Operational

	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					
Area	0.2910	1.0000e-005	5.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0300e-003	1.0300e-003	0.0000	0.0000	1.0900e-003
Energy	6.7400e-003	0.0613	0.0515	3.7000e-004		4.6600e-003	4.6600e-003		4.6600e-003	4.6600e-003	0.0000	225.5475	225.5475	8.5800e-003	2.7300e-003	226.5751
Mobile	0.0122	0.0422	0.1707	2.3000e-004	0.0151	6.3000e-004	0.0157	4.0300e-003	5.8000e-004	4.6100e-003	0.0000	19.3039	19.3039	8.8000e-004	0.0000	19.3223
Waste						0.0000	0.0000		0.0000	0.0000	14.4631	0.0000	14.4631	0.8548	0.0000	32.4128
Water						0.0000	0.0000		0.0000	0.0000	4.2156	49.5121	53.7276	0.4353	0.0107	66.1832
Total	**0.3100**	**0.1035**	**0.2227**	**6.0000e-004**	**0.0151**	**5.2900e-003**	**0.0204**	**4.0300e-003**	**5.2400e-003**	**9.2700e-003**	**18.6787**	**294.3645**	**313.0432**	**1.2995**	**0.0134**	**344.4945**

Mitigated Operational

	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					
Area	0.2910	1.0000e-005	5.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0300e-003	1.0300e-003	0.0000	0.0000	1.0900e-003
Energy	6.7400e-003	0.0613	0.0515	3.7000e-004		4.6600e-003	4.6600e-003		4.6600e-003	4.6600e-003	0.0000	225.5475	225.5475	8.5800e-003	2.7300e-003	226.5751
Mobile	0.0122	0.0422	0.1707	2.3000e-004	0.0151	6.3000e-004	0.0157	4.0300e-003	5.8000e-004	4.6100e-003	0.0000	19.3039	19.3039	8.8000e-004	0.0000	19.3223
Waste						0.0000	0.0000		0.0000	0.0000	14.4631	0.0000	14.4631	0.8548	0.0000	32.4128
Water						0.0000	0.0000		0.0000	0.0000	4.2156	49.5121	53.7276	0.4352	0.0107	66.1765
Total	**0.3100**	**0.1035**	**0.2227**	**6.0000e-004**	**0.0151**	**5.2900e-003**	**0.0204**	**4.0300e-003**	**5.2400e-003**	**9.2700e-003**	**18.6787**	**294.3645**	**313.0432**	**1.2994**	**0.0134**	**344.4877**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.07**	**0.00**

Combat Center Solar PV System – Construction and Operation

Mojave Desert Air Basin, Annual

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2016	4/30/2016	5	86	
2	Grading	Grading	5/1/2016	7/31/2016	5	65	
3	Building Construction	Building Construction	8/1/2016	12/30/2017	5	370	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	2	6.00	174	0.41
Site Preparation	Off-Highway Trucks	2	6.00	400	0.38
Site Preparation	Rubber Tired Dozers	2	6.00	255	0.40
Site Preparation	Scrapers	2	6.00	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	5	6.00	97	0.37
Grading	Graders	2	6.00	174	0.41
Grading	Off-Highway Trucks	2	6.00	400	0.38
Grading	Rubber Tired Dozers	2	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	5	6.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	2	6.00	84	0.74
Building Construction	Off-Highway Trucks	2	6.00	400	0.38
Building Construction	Other Construction Equipment	2	6.00	171	0.42
Building Construction	Rubber Tired Dozers	5	6.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	5	6.00	97	0.37
Building Construction	Trenchers	2	6.00	80	0.50
Building Construction	Welders	2	6.00	46	0.45

Combat Center Solar PV System – Construction and Operation

Mojave Desert Air Basin, Annual

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
Site Preparation	13	75.00	23.00	0.00	16.80	30.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	11	75.00	23.00	0.00	16.80	30.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	23	150.00	23.00	0.00	16.80	30.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

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	0.0122	0.0422	0.1707	2.3000e-004	0.0151	6.3000e-004	0.0157	4.0300e-003	5.8000e-004	4.6100e-003	0.0000	19.3039	19.3039	8.8000e-004	0.0000	19.3223
Unmitigated	0.0122	0.0422	0.1707	2.3000e-004	0.0151	6.3000e-004	0.0157	4.0300e-003	5.8000e-004	4.6100e-003	0.0000	19.3039	19.3039	8.8000e-004	0.0000	19.3223

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	14.37	0.00	0.00	39,642	39,642
Total	14.37	0.00	0.00	39,642	39,642

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3

Combat Center Solar PV System – Decomissioning

Mojave Desert Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	1.32	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	3			**Operational Year**	2035
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 - The proposed decommissioning would occur in the year 2053 but the model will not accept an operational year past 2035, so for modeling purposes the year 2035 was selected.

Land Use - CalEEMod does not have a “Utility” land use type as a default option; therefore, “General Light Industry” was chosen as the closest appropriate option.

Construction Phase - Demolition only. Assumed 2 months of demolition activity, assumed to be Year 2053.

Off-road Equipment - Off-highway truck = water truck.

Construction Off-road Equipment Mitigation - Mitigation measures / BMPs: water exposed area 2x daily during decommisioning activities; use construction vehicles that meet the USEPA Tier 4 emissions standards; and replace ground cover of disturbed area.
Trips and VMT - Added 16 trips/day to the model's estimated number of daily worker trips, to account for the delivery of water to the site during the decommisioning process.

Combat Center Solar PV System – Decomissioning

Mojave Desert Air Basin, Annual

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	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
Year	tons/yr										MT/yr					
2053	0.0244	0.1221	0.2755	5.7000e-004	0.0400	2.0700e-003	0.0421	7.1300e-003	2.0700e-003	9.2000e-003	0.0000	52.5490	52.5490	1.9300e-003	0.0000	52.5896
Total	**0.0244**	**0.1221**	**0.2755**	**5.7000e-004**	**0.0400**	**2.0700e-003**	**0.0421**	**7.1300e-003**	**2.0700e-003**	**9.2000e-003**	**0.0000**	**52.5490**	**52.5490**	**1.9300e-003**	**0.0000**	**52.5896**

Mitigated Construction

	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
Year	tons/yr										MT/yr					
2053	6.1200e-003	0.0265	0.3191	5.7000e-004	0.0179	8.2000e-004	0.0187	3.7700e-003	8.2000e-004	4.5900e-003	0.0000	52.5490	52.5490	1.9300e-003	0.0000	52.5895
Total	**6.1200e-003**	**0.0265**	**0.3191**	**5.7000e-004**	**0.0179**	**8.2000e-004**	**0.0187**	**3.7700e-003**	**8.2000e-004**	**4.5900e-003**	**0.0000**	**52.5490**	**52.5490**	**1.9300e-003**	**0.0000**	**52.5895**

	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**	**N20**	**CO2e**
Percent Reduction	**74.89**	**78.30**	**-15.84**	**0.00**	**55.42**	**60.39**	**55.68**	**47.12**	**60.39**	**50.11**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2053	2/28/2053	5	43	

Combat Center Solar PV System – Decomissioning

Mojave Desert Air Basin, Annual

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37

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
Demolition	5	13.00	16.00	261.00	16.80	30.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Clean Paved Roads

Appendix D

Cumulative MILCON Projects

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PRESENT AND REASONABLY FORESEEABLE MILCON PROJECTS AT THE COMBAT CENTER

The following paragraphs summarize present and reasonably foreseeable MILCON projects that are planned at the Combat Center. These MILCON projects are considered in the analysis of cumulative impacts summarized in Chapter 4 of the EA. Project-specific site improvements or design features, as well as the proposed size of each structure or infrastructure footprint for each of the projects, are described below.

P-191: Addition to Camp Wilson Gym (Building 5411)

P-191 consists of a pre-engineered building (3,208 square ft) as an addition to the existing Camp Wilson Gym (Building 5411). The addition is needed to achieve required machine spacing and meet safety requirements of 36 inches between equipment and for pathways. The building would be built adjacent to the southwest wall of Building 5411. The buildings would be accessible through the existing main entrance into Building 5411 and by two 12-ft openings that would be cut into the adjacent walls. The addition would include two unisex bathrooms, each with only a sink and a toilet. White lights would be used to light the building and rubber matting would be used for flooring.

Supporting facilities would include electrical utilities, water utilities, sanitary sewer utilities, gas utilities, steam, and controls. Paving and Site Improvements would include paved roads and parking, curbs and gutters, specialty walks/pavers, sidewalks, pedestrian and bicycle features, stormwater drainage improvements, and fencing and gates.

P-193: Marksmanship Training Unit Multi-purpose Classroom

P-193 would construct an 11,916-square ft classroom to the north of the Mainside area.

P-194: Convert Building 2025 to Wheeled Vehicle Maintenance Facility

P-194 would renovate and repair Building 2025, a 22,680-square ft facility constructed of pre-cast, tilt-up concrete in 1986. Building 2025 is used to maintain heavy equipment and Humvees. The south side of the building is used for field utility equipment (lights, generators, etc.) and a tire shop. A portion of the building is used for tire storage, and there is a sunshade adjacent to Building 2025 where maintenance is currently being conducted when there is not enough space to complete work in the maintenance bays. Building 2025 is in fair condition, but is a large, poorly designed space.

P-194 would convert the existing warehouse space into 12 wheeled vehicle maintenance bays, while the existing office space would be relocated adjacent to the existing toilets. The existing metal stud walls, doors, ceilings and flooring would be demolished and replaced with new 20 gauge metal stud walls finished with abuse-resistive drywall. Four openings would be saw-cut in the exterior walls on the western and eastern sides of the facility to accommodate new electric roll-up doors. Ramps would be added to the west side of the building, leading to the existing loading dock, to provide access to the new service bays. A new, self-supporting metal canopy would be erected on the west side of the facility, adjacent to the existing tire shop, to provide tire storage. The storage area would be secured with a chain-link fence and gate. Upgrades/improvements would also be made to toilet rooms, mechanical systems, power distribution equipment, heating systems, ventilation systems, interior (air handling unit) and exterior (remote condensing unit) air conditioning units, lighting,

Site improvements would include storm water drainage improvements. Electrical systems would include communications, electrical distribution, exterior lighting, and a 500 kilovolt-ampere pad-mounted transformer. Special construction includes a separate hazardous materials containment area, with

provisions for proper ventilation, expansion of the vehicle exhaust system, and a crane center to accommodate two 20-25,000 pound top running cranes, lube systems, and compressed air systems.

P-581: Marine Corps Air Ground Combat Center Headquarters Building

P-581 would involve the demolition of Buildings 1554, 1555, and 1559 to make way for a new 22,270-square ft headquarters building.

P-602: Training Integration Center

P-602 would construct a 41,635-square ft, multi-story Training Integration Center to provide a consolidated, efficiently configured, processing center and adequate temporary billeting for newly arriving junior enlisted students. The first level of the facility would contain a single primary entrance, duty room/control point with linen issue and storage, administrative processing areas, 250 occupant multi-purpose space, recreation/television viewing areas, multi-media classroom, library and study areas, public restrooms, and equipment storage lockers/rooms. The upper levels would consist of open bay barrack spaces for temporary billeting with central laundry, janitorial and vending spaces. There would be four squad bays per floor; each squad bay would hold 20 students for a total sleeping capacity of 240 students. Each bay would have direct access to its own shower/restroom facilities. Student barracks would comprise 33,583 square ft of the facility, while 8,051 square ft would comprise the processing center. Community and service core areas would consist of laundry facilities, TV lounge, administrative offices, housekeeping areas and public restrooms.

Site improvements would include sidewalks, outdoor recreation facilities/courts, bus drop off lane, earthwork/grading, storm water management, and water efficient landscaping. Electrical systems would include fire alarms, energy saving electronic monitoring and control system, and information systems. Mechanical systems would include plumbing, fire protection systems, heating ventilation, and air conditioning. Built-in equipment would include one service elevator. Connections to the high temperature hot water lines with secondary distribution loops would also be constructed.

P-603: Vehicle Training and Equipment Facility

P-603 would include alterations and additions to Building 1855 (27,706 square ft) to provide the required vehicle maintenance space for the assigned communications vehicles of the Marine Corps Communications Electronics School. P-603 would construct classroom and covered exterior instruction space for drivers of tactical vehicles and communications equipment operators. Permanent facilities would be constructed of concrete and masonry construction, steel roof framing, decking, and 5-ply built-up roofing. The project would include the construction insulated and air conditioned classroom space, a vehicle hoist in the maintenance facility, bathrooms for male and female students, and covered parking space for communications vehicles.

P-618: Multi-Purpose Administration Building

P-618 would provide an administration building (29,084 square ft) to house the general administration functions that support the Combat Center and replace the six, old, single story buildings that are safety hazards and energy consuming structures. Building 1551 (old hospital) would also be demolished. A three story, permanent facility would be constructed of reinforced steel, concrete framing, and masonry block infill. The project would provide sidewalks, landscaping, irrigation, paved parking, curbs and gutters, exterior lighting and 40 tons of air conditioning.

Supporting facilities include electrical, water, sanitary sewer and gas utilities. Paving and site improvements include signage, landscaping and irrigation, roads, and sidewalks.

P-641: Addition East Gym 1588

P-641 would construct a 19,999-square ft multi-story addition including renovation to the existing east gymnasium (Building 1588) at the Combat Center. The addition would be constructed of reinforced concrete slab-on-grade with perimeter footing and spread beam foundation, reinforced concrete masonry exterior walls, and a standing seam metal roof. Special construction features include sound attenuation and upgrades to the building's existing electrical distribution system to handle the increased load.

Site preparation would include excavation, grading, structural fill and site cleanup. Site improvements would include sidewalks and an additional 160 surface parking spaces. Electrical systems would include communications, fiber optic, electrical distribution, and a 300 kilovolt-ampere transformer to replace the existing 225 kilovolt-ampere transformer. Mechanical systems would include potable water utilities, fire hydrants, mechanical utilities, sanitary sewer utilities, and an Energy Management Control System.

P-641 would also include miscellaneous demolition to permit the expansion of the existing facility, including removal of a store front system, concrete sidewalk, steps, and railing.

P-662: Expeditionary Fighting Vehicle Maintenance Facility

This project would construct a new Expeditionary Fighting Vehicle (EFV) Maintenance Facility (67,371 square ft) to accommodate 58 EFV tracked and non-tracked vehicles for the 3rd Amphibious Assault Battalion. The primary facility would consist of a 10,514-square ft amphibian vehicle maintenance shop and a 3,868-square ft automotive organizational shop. The facilities would be constructed with reinforced concrete masonry block walls, concrete foundation, concrete slab, and a standing seam metal roof over steel trusses. The maintenance facilities would include six maintenance bays to perform maintenance on Expeditionary Fighting Vehicles.

This project would also construct a 39,310-square ft vehicle holding shed to protect wheeled and tracked armored vehicles from accelerated deterioration due to extreme environmental conditions and a 9,054-square ft Closed Loop Tactical Vehicle Wash Platform with six washracks, including a crane to remove engines to allow for secondary hull cleaning. This project would construct 4,628 square ft of office space. Paving and site improvements would include paved privately-owned vehicle parking, sidewalks, roadway access, earthwork, grading and landscaping. Anti-terrorism/force protection features include fencing, barriers and gates.

P-680: West Gym Addition

P-680 would involve a 19,999-square ft expansion of the West Gym.

P-900: Marine Corps Communication and Electronic Classroom

P-900 would construct a 91,762-square ft three-story academic and applied instruction facility for the training mission at the Combat Center in direct support of the Marine Corps Communications and Electronic School. Community and service core areas would consist of instructor administrative spaces, multipurpose rooms, housekeeping areas and public restrooms. Special building design would include built-in equipment for two freight elevators, one-hour construction walls for computer areas, and raised flooring in all classroom and laboratory areas.

Site improvements would include paved parking, sidewalks, outdoor furniture, lighting, roadway access, earthwork, grading and landscaping. Electrical systems would include fire alarms, energy saving electronic monitoring and control system, and information systems. Mechanical systems include

plumbing, fire protection systems, heating ventilation and air conditioning, and connections to a central chilled water plant and relocation of high temperature hot water lines with secondary distribution loops.

P-900 would also demolish two existing classrooms, Buildings 1757 and 1758 (each 30,160 square ft).

P-902: MCCES Bulk Supply Warehouse

P-902 would provide a new, permanent, single-story, concrete warehouse building (12,109 square ft) in direct support of the Marine Corps Communications and Electronic School. The building would consist of concrete foundation, concrete floor slab reinforcement run continuously through both faces of the slab and into beams and columns, tilt-up concrete walls, and sloped standing seam metal roofing. The building would have open web steel joist roof support. Community and service core areas would consist of administrative offices, housekeeping areas and public restrooms.

Supporting facilities work would include site and building utility connections (water, sanitary sewers, electrical, telephone, local area network and cable television). Electrical systems would include fire alarms, energy saving electronic monitoring and control system, and information systems. Mechanical systems would include plumbing, fire protection systems, heating ventilation and air conditioning. Paving and site improvements would include loading docks, sidewalks, roadway access, earthwork, grading and landscaping.

P-903: MCCES Consolidated Radar Classroom

P-903 would consolidate radar training that is currently located in three obsolete buildings constructed in 1967. This project would construct an approximately 32,292-square ft consolidated radar classroom. The project would also construct five external radar sites adjacent to new facility. Buildings 1826, 1828, and 1839 would be demolished as a part of this project.

P-921: Electronic/Communications Maintenance & Storage Facility

P-921 would construct a consolidated electronic and communications maintenance shop (10,204 square ft) and unit storage facility (24,649 square ft). Community and service core areas would consist of administrative offices, maintenance shops, public restrooms, and storage areas.

Site improvements would include a loading dock, concrete pavement for the loading area, sidewalks with curbs and gutters, new roadway access to the west side of the new building, earthwork, grading, landscaping, shaded vehicle yards surrounded with security fences and gates, repair of storm drainage, and repair of existing roadway access. Electrical systems would include fire alarms, energy saving electronic monitoring and control system, and information systems including public address system and security monitoring system. Mechanical systems would include plumbing, fire protection systems, compressed air system and heating ventilation and air conditioning system and repair of existing high temperature hot water lines.

P-921 would demolish Buildings 1721, 1723, 1724, 1725, 1726 and 1727 (totaling 24,113 square ft), including necessary asbestos and lead base paint removal and clearing of existing underground utilities.

P-926B: Library/Lifelong Learning Center, Phase II

P-926B is Phase II of a two-phase project that constructs a three-story facility to support the library functions at the Combat Center. Phase I of the project is to construct an adjoining three-story Life Long Learning Center (Education Center). P-926B, Phase II, would construct a 21,000-square ft library to be used as the Command Reference Center and support the increase of personnel at the Combat Center. The

project would construct library spaces to include large areas for office space, classrooms, book racks, computer rooms, reading rooms, and supporting areas.

Site improvements would include excavation, grading, excess material removal, curbs and gutters, parking and an access road, sidewalks, desert landscaping with irrigation, stormwater control features, pedestrian and bicycle features, and a pedestrian bridge to connect the Library/Lifeling Learning Center. Special construction would include a fire pump, four stop personnel elevator, and basement excavation and shoring for an elevator maintenance room. Electrical systems would include fire alarms, energy saving electronic monitoring and control system, electrical connection to the grid, exterior lighting and information system connections. The mechanical system would include fire protection systems, high temperature hot water and chilled water systems, and water and sewer connections.

P-987: Addition to Temporary Lodging Facility

P-987 would construct a two-story, 20-room, 8,860-square ft, detached addition, to the existing facility and a 6,050-square ft macadam parking lot to accommodate the additional occupancy. Other project components include paving and site improvements including parking, sidewalks, earthwork, grading, and landscaping. The temporary lodging facility is required to provide lodging to military members and their families assigned to the Combat Center, while they await assignment to government quarters or locate housing in the local community.

P-988: Gate Reconfiguration, AT/FP Upgrades

P-988 would construct a new gate house facility (2,497 square ft) including vehicle inspection lanes, sentry inspection houses (194 square ft), and related supporting facilities at the Main Gate and two auxiliary gates.

Supporting facilities would include a special foundation of borrow and fill of entrance areas, electrical requirements of transformer, electrical distribution, overhead lighting, interior communications and telephone; mechanical utilities includes connection to water, sewer, and natural gas. Site improvements would include grading, asphalt and concrete pavements, concrete curbs, concrete dividers, traffic medians, sidewalks, parking areas, overhead signs, road striping and traffic signs, flag poles, and landscaping and irrigation.

P-988 would demolish existing gate facilities and related asphalt and concrete pavement, concrete curbs and related supporting facilities. The project would also demolish five gate facilities totaling 1,456 square ft: Buildings 900, 901, and 904 (Main Gate), 1000 (Condor Gate), and 3334 (Ocotillo Gate).

P-989: Perimeter Fencing (North of Mainside)

P-989 would involve the construction of an AT/FP perimeter fence to the north of the Mainside area.

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Appendix E

Agency Correspondence

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UNITED STATES MARINE CORPS
MARINE AIR GROUND TASK FORCE TRAINING COMMAND
MARINE CORPS AIR GROUND COMBAT CENTER
BOX 788110
TWENTYNINE PALMS, CALIFORNIA 92278-8110

5750
4E/c-15-0094

APR 2 7 2015

Dr. Carol Roland-Nawi
State Historic Preservation Officer
Office of Historic Preservation
Department of Parks and Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Subj: PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC SYSTEM IN THE MAINSIDE AREA, MARINE CORPS AIR GROUND COMBAT CENTER, TWENTYNINE PALMS, SAN BERNARDINO COUNTY, CALIFORNIA

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulation, 36 CFR 800, the Marine Corps is providing for your review and concurrence, information regarding the proposed undertaking to construct a solar photovoltaic (PV) system in the Mainside Area aboard the Marine Corps Air Ground Combat Center (Combat Center). The solar PV system will include:

1. The construction of a solar PV array on the Mesquite Dry Lake playa between Adobe Road, Del Valle Road, and the Combat Center boundary.

2. The development of a power transmission line extending from the Mesquite Dry Lake playa west to connect to existing power transmission lines along Berkeley Road.

The completed solar PV array field would occupy approximately 241 acres (97 ha), and would consist of solar PV panels, steel tracking structures, inverters, combiner boxes, electrical switchgear, a substation, and associated electrical wiring, connections, and other hardware required for the solar PV system. In addition, three action alternatives for the route of the proposed power transmission line upgrades have been proposed in the Environmental Assessment (EA). Alternative 1 includes the upgrade of an existing power line, while Alternatives 2 and 3 include the establishment of a new power transmission line across a portion of the Mesquite Dry Lake playa to connect to an existing power line.

Today, full project packets, including project description and reports, are being provided to the following tribes: Agua Caliente Band of Cahuilla Indians, Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Morongo Band of Mission Indians, San Manuel Band of Mission Indians, and the Twentynine Palms Band of Mission Indians. According to the Native American Heritage Commission and past consultation with the aforementioned tribes, there are no sacred sites in the proposed project area.

The Marine Corps believes the enclosed documentation satisfies requirements set forth in CFR 800.11(d). Based on our research, we have reached a finding of "no historic properties affected." The Marine Corps requests concurrence with this finding.

Please feel free to contact the Combat Center Cultural Resources Manager, Ms. Leslie Glover, at 760-830-5369 (leslie.glover@usmc.mil), or Dr. John Hale at 760-830-7641 (john.p.hale@usmc.mil), with any questions or concerns.

Sincerely,

T. B. POCHOP
LtCol, USMC
Director, NREA

Enclosures: 1. Archeological Survey of 396 Acres for Proposed Photovoltaic Array on the Mesquite Dry Lake Playa in the Mainside Area

Copy to: AC/S G-4
NREA Files/Conservation
Mr. Brendon Greenaway, CA SHPO

May 20, 2015

Reply in Reference To: USMC_2015_0429_001

LtCol. T. B. Pochop, Director
Natural Resources and Environmental Affairs Division
Marine Corps Air Ground Combat Center
United States Marine Corps
Box 788110
Twentynine Palms, California 92278-8110

Re: Construction of a Solar Photovoltaic System in the Mainside Area, MCAGCC, Twentynine Palms, San Bernardino County, California (your letter 5750, 4E/c-15-0094 of April 27, 2015)

Dear Colonel Pochop:

Thank you for initiating consultation regarding the United States Marine Corps' efforts to comply with Section 106 of the *National Historic Preservation Act of 1966* (54 U.S.C. § 306108), as amended, and its implementing regulation found at 36 CFR Part 800. Marine Corps Air Ground Combat Center (MCAGCC) proposes to construct a solar photovoltaic (PV) array in the Mainside Area and an electrical transmission line to connect the solar array to an existing power line.

The proposed undertaking will consist of the following components:

- The solar PV array will consists of solar PV panels, steel tracking structures, inverters, combiner boxes, electrical switchgear, a substation, and associated electrical wiring, connections, and other hardware required for the solar PV system;
- Three alternative routes are being analyzed for the proposed transmission line;
- Alternative 1 involves the upgrading of an existing power line; and
- Alternatives 2 and 3 involve the establishment of a new power transmission line across a portion of the Mesquite Dry Lake playa to connect to an existing power line.

The area of potential effects (APE) has been identified as containing the components described above and encompassing approximately 260 acres (approximately 242 acres for the solar array and 16 to 18 acres for the proposed transmission line). Access to the APE will be via existing paved roads.

The APE is located in an area that was part of the original airfield that was constructed in 1942 for the Twentynine Palms Air Academy at Condor Field by the U. S. Army Air Force. The area was graded extensively during World War II and a perforated steel plank (PSP) runway and associated taxiway and aircraft parking areas were emplaced on the graded lakebed. The PSP was removed in the early 1980s and since then the area has been used for various military activities. Consequently, the APE has been graded and re-graded extensively since 1942.

As documentation for your finding of effect, you provided a report entitled: *Archeological Survey of 396 acres for proposed Photovoltaic Array on the Mesquite Dry Lake Playa in the Mainside Area.* The report was prepared by Dr. John P. Hale (USMC).

A records review was conducted at the Cultural Resources Section of the Natural Resources and Environmental Affairs (NREA) Division at MCAGCC. The records review revealed: (1) no cultural resources were identified as being located within the APE; and (2) ten cultural surveys had been conducted previously within an ¼-mile radius of the APE and none of those surveys identified any cultural resources as being located within an ¼-mile radius of the APE. A pedestrian survey of the APE was conducted by personnel from the NREA Division between November 6, 2014 and February 19, 2015 with negative results.

MCAGCC consulted with 7 tribal governments or groups and the Native American Heritage Commission (NAHC) in regards to the proposed undertaking. No responses were received from the tribal governments or groups.

Based on the records review, the pedestrian survey, and the tribal consultations, MCAGCC has concluded that no historic properties are located within the APE. Therefore, MCAGCC has concluded that a finding of No Historic Properties Affected is appropriate for this proposed undertaking.

After reviewing your letter of April 27, 2015, I have the following comments:

(1) I have no objections to your identification and delineation of the APE, pursuant to 36 CFR Parts 800.4(a)(1) and 800.16(d); and
(2) I concur that your finding of No Historic Properties Affected is appropriate for this proposed undertaking.

Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have additional future responsibilities for this proposed undertaking under 36 CFR Part 800. Should you encounter cultural artifacts during ground disturbing activities, please halt all work until a qualified archaeologist can be consulted on the nature and significance of such artifacts.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact either of the following members of my staff: Ed Carroll at (916) 445-7006 or at e-mail at Ed.Carroll@parks.ca.gov or Duane Marti at (916) 445-7030 or at email at Duane.Marti@parks.ca.gov.

Sincerely,

(for) Carol Roland-Nawi, PhD
State Historic Preservation Officer