



Final
**Programmatic Environmental Impact Statement
of Activities and Operations**
Yuma Proving Ground, Arizona



Prepared for
U.S. Army Yuma Proving Ground



Prepared by
U.S. Army Corps of Engineers



**US Army Corps
of Engineers®**
Mobile District

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Programmatic Environmental Impact Statement
for
Activities and Operations
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Abstract

The Final Programmatic Environmental Impact Statement (FPEIS) analyzes construction, testing, and training activities and operations at Yuma Proving Ground in Arizona. The FPEIS identifies minor to moderate impacts for air quality, cultural resources, wildfire, hazardous materials, noise, recreational hunting, soils, threatened or endangered species, short-term traffic, vegetation, and water quality. The FPEIS identifies mitigation to reduce or eliminate adverse impacts.

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How to Read This Final Programmatic Environmental Impact Statement

This Final Programmatic Environmental Impact Statement (FPEIS) for Activities and Operations at Yuma Proving Ground contains both programmatic analyses and detailed analyses of specific actions. Yuma Proving Ground (YPG) has identified a Proposed Action that includes (1) well-defined short-term projects that could be implemented upon completion of this National Environmental Policy Act (NEPA) analysis that are analyzed in detail, (2) short-term projects that are not well-defined or that have unspecified locations for which programmatic analysis is appropriate, and (3) long-term, less well-defined activities for which programmatic analysis is appropriate. As the projects become better defined, tiered NEPA documents (Record of Environmental Consideration for Categorical Exclusions, Environmental Assessments, or Environmental Impact Statements) can be completed for these projects. This document identifies which Proposed Action activities were analyzed in detail and which were analyzed programmatic in Tables 2-1 through 2-6. Initially, this PEIS was developed from projects identified for development of a draft Real Property Master Plan (RPMP). That draft RPMP was not fully developed and additional projects have been identified that YPG proposes to implement. Therefore, this FPEIS addresses planned activities and operations at YPG and will be suitable to support future development of a RPMP at YPG.

Multiple areas on YPG are commonly known on the installation as “impact areas” because explosive and inert munitions are fired there. To avoid confusion over use of the word “impact,” which is used in this document in a NEPA sense, munitions firing areas, such as small arms ranges, are referred to herein as “munitions impact areas” to distinguish them from areas where impacts from the Proposed Action could occur, which could be anywhere on the installation.

This FPEIS is organized into the following sections and appendices:

- Executive Summary – Includes information about the purpose and need for the Proposed Action, the project location, a description of the alternatives considered in the FPEIS, a description of the public outreach process, a summary of the environmental consequences of each alternative, and a description of proposed mitigation measures.
- Section 1 – Purpose and Need: Presents the purpose of the Proposed Action and outlines Army requirements that drive and influence the need to modify testing and training activities at YPG. This section also describes the scope of the FPEIS, the decision to be made by the Army, and public and agency coordination that influenced development of the scope of the FPEIS and the analysis.
- Section 2 – Description of the Proposed Action and Alternatives: Describes the relevant study area, describes the Proposed Action, explains the criteria used to develop reasonable alternatives to the Proposed Action, identifies alternatives that were considered but not analyzed in the FPEIS, and presents the alternatives considered in the FPEIS with a summary of their consequences. This section also discusses the Army’s Preferred Alternative.
- Section 3 – Affected Environment and Environmental Consequences: Describes the priorities for environmental analysis based on the resources that could be affected by the

Proposed Action. The baseline or existing condition for each resource area is provided, regardless of the potential for impact. Following the description of existing conditions, impacts are discussed. For each resource area, significance criteria for impacts are identified and the potential direct, indirect, and cumulative impacts of implementing the alternatives are analyzed. Impacts resulting from the testing and training activities and construction and demolition of facilities are presented for each alternative, as appropriate.

- Section 4 – List of Preparers: Identifies the primary individuals responsible for preparation of the FPEIS and their qualifications, and indicates the sections of the FPEIS to which they contributed.
- Section 5 – Distribution List: Presents the distribution list for the FPEIS.
- Section 6 – References: Lists the sources referenced in the FPEIS.
- Section 7 – Agencies and Persons Contacted: Lists the relevant entities contacted during preparation of the FPEIS.
- Section 8 – Public, Agency, and Tribal Comments and Responses: Presents all correspondence relevant to the FPEIS and the Army responses to comments received.
- Section 9 – Index: Presents a page number index to the key issues and topics addressed in this FPEIS.
- Appendix A – Public Outreach
- Appendix B – Activities Conducted Under the No Action Alternative
- Appendix C – Detailed Project-specific Impacts Analysis
- Appendix D – Quick Look Answers
- Appendix E – Air Emissions Calculations
- Appendix F – Programmatic Agreement
- Appendix G – Interior Bureau of Land Management Lower Colorado River District, Yuma Office, and U.S. Department of the Army Yuma Proving Ground
- Appendix H – Noise Contour Figures from the Installation Operational Noise Management Plan
- Appendix I – Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat
- Appendix J – Sensitive Species Tracked by State of Arizona with Potential to Occur in Yuma and La Paz Counties

Executive Summary

United States Army Yuma Proving Ground (YPG) and the U.S. Army Corps of Engineers, Mobile District have prepared this Final Programmatic Environmental Impact Statement (FPEIS) to assess the potential impacts associated with activities and operations at YPG. This FPEIS analyzes construction, testing, and training activities and assesses the direct, indirect, and cumulative effects of the Proposed Action. The Proposed Action would maintain YPG's activities as a multi-purpose installation, but also would create new infrastructure and implement new programs, including cross-functional training allowed by the Department of Defense. The FPEIS will support development of a future Real Property Master Plan (RPMP) at YPG. The analysis in the FPEIS also will support the alternatives analysis for the RPMP.

Activities anticipated on YPG include (1) construction and demolition of facilities and infrastructure and (2) changes to accommodate additional types of operational training and the capacity to support fluctuating demands on levels of testing and training adequately. The FPEIS addresses the following types of activities:

- Short-term, well-defined activities at known locations that could be implemented without additional National Environmental Policy Act of 1969 (NEPA) [42 United States Code (U.S.C.) 4321-4347] analysis once a decision is made
- Short-term, less well-defined activities for which locations are not known or for which additional information regarding site-specific implementation must be developed, that would receive additional site-specific NEPA analysis prior to project implementation
- Long-term, less well-defined activities that would occur later in time and would receive additional site-specific NEPA analysis prior to project implementation

This document examines the sum of the activities that will occur or are likely to occur on YPG for the next several years. It is not always possible to predict accurately specific projects in specific years, but the Army is confident about the types of activities that will occur and the general technology trends that will establish the testing and training workloads in coming years; therefore, the Army is adopting a programmatic approach to this analysis to comply with NEPA and set the framework for future tiered documents if required. The analysis focuses on the anticipated impacts of categories of actions on the natural and human environment. Accordingly, the analysis examines military testing activities, military training activities, construction, and demolition, as appropriate for each activity.

This document identifies which activities were analyzed in detail and which were analyzed programmatically. The analysis evaluates all projects proposed for the foreseeable future. It is likely that not all evaluated activities would be implemented and the decision could indicate that only a portion of the activities analyzed will be selected. The alternatives for specific activities considered include testing, training, and construction/demolition options to meet the evolving mission requirements of YPG.

ES.1 Project Setting

YPG is a U-shaped Army facility located in southwestern Arizona (refer to Figure 2-1 in the FPEIS). The land between the arms of the “U” is managed by the U.S. Fish and Wildlife Service (USFWS) as the Kofa National Wildlife Refuge (NWR). YPG is subdivided into five functional units, with each unit performing a different function in relation to the mission:

- Laguna Region
- Cibola Region
- Kofa Region, including Kofa Firing Range (KFR) and East Arm
- Airspace
- Off-post Locations

Off-post locations are not addressed in this FPEIS since no changes are proposed for use of offsite areas.

YPG has restricted military airspace over most of YPG and over most of the Kofa NWR (refer to Figure 2-3 in the FPEIS). Restricted airspace places priority on military operations, but can be used by private or commercial flights with advance clearance during periods when not in military use. YPG allows use of its airspace by other military services for training activities when not in use by the installation.

ES.2 Alternatives

Three alternatives are carried forward for evaluation in this FPEIS:

1. The No Action Alternative is the continuation of existing operations on YPG. Under the No Action Alternative, testing and training would continue at the current levels and utilize existing facilities and infrastructure with no new construction. Ongoing testing and training occur in specific areas within YPG, and the locations of current activities are depicted on Figures 2-4 through 2-12 in the FPEIS. Tables identifying the testing and training activities included under the No Action Alternative are provided in Appendix B, as Tables B-1 through B-3, which are presented by region (Laguna, Cibola, and Kofa Regions). No test areas, munitions impact areas, or drop zones (DZs) would be expanded under the No Action Alternative. No construction or demolition would occur under the No Action Alternative.
2. The Proposed Action includes the activities identified under the No Action Alternative and the short-term and long-term projects identified by YPG that would be necessary to meet anticipated future needs, including new construction and associated demolition, testing, and training activities that would occur on YPG, and new testing and training proposed by supported components to meet anticipated testing or training needs.
3. The Preferred Alternative was developed by the U.S. Army after consideration of input from government agencies and tribal organizations. The Preferred Alternative is to a subset of the Proposed Action and includes reduced areas for two proposed activities (K003 and K026), the smaller of considered alternatives for two activities (L030-a, C034-a), specifies which of the considered alternatives would be implemented for other activities with reasonable alternatives (L031, L034, K024), implements the remainder of the Proposed Action, as proposed.

The locations of components of the Proposed Action planned to occur in the Laguna Region are shown on Figure 2-13 of the FPEIS. Fifty-six proposed activities have been identified for this region of YPG. This includes 14 long-term activities. Identifiers for the activities are located in Tables 2-1 and 2-2 in the FPEIS. These activities include infrastructure construction, expansion of test areas to accommodate additional testing, and planned changes in testing and training activities.

The construction, testing, and training activities planned to occur in the Cibola Region are identified in Tables 2-3 and 2-4 in the FPEIS and the locations are shown on Figure 2-14. The identifiers for each project in Tables 2-3 and 2-4 correspond to the identifiers on Figure 2-14. These activities include infrastructure construction, expansion of test areas to accommodate additional testing, planned changes in testing and training activities, and provision of appropriate supporting infrastructure for continued testing and training activities, such as appropriate petroleum, oil, and lubricants (POL) storage at remote testing locations.

Construction, testing, and training activities planned for the Kofa Region are listed in Section 2 of the FPEIS in Tables 2-5 and 2-6, with the locations shown on Figure 2-15. The identifiers for each project in Tables 2-5 and 2-6 correspond to the identifiers on Figure 2-15. These activities include infrastructure construction, expansion of test areas to accommodate additional testing, and planned changes in testing and training activities.

In addition to specific short-term projects analyzed in detail, the Proposed Action includes programmatic analysis of less well-defined short-term projects and long-term projects that are likely to be implemented following further design and analysis or implemented on an as-needed basis for specific testing needs.

The Preferred Alternative is depicted on Figures 2-16, 2-17, and 2-18.

One project under consideration is a solar renewable energy project. YPG is investigating the possibility of developing an enhanced use lease (EUL) with a private company to develop a commercial-scale solar-powered renewable electrical generation facility on the installation. A separate analysis under NEPA would be prepared for this project and an EUL for solar power generation is not a component of the Proposed Action. The possibility of the future development of a solar facility was considered in the assessment of potential cumulative impacts, based on proposed specifications at the time this document was prepared. Construction, operation, and maintenance of a solar electric generation facility could contribute to cumulative impacts to air quality, cultural resources, energy and utilities, hazardous materials, land use, recreation, socioeconomics, soils, threatened and endangered species, traffic/transportation, vegetation, visual resources, surface water and groundwater resources, and wildlife.

ES.3 Alternatives for Activities in the Proposed Action

Reasonable alternatives for individual projects included in the Proposed Action were evaluated. Potential alternatives for specific proposed projects included in the Proposed Action subjected to detailed analysis in this document are provided in Section 2.5. This section identifies those proposed activities where reasonable alternatives exist and provides a description of alternatives considered. Proposed projects for which no feasible alternatives exist also are identified and the justification for not considering other alternatives is provided.

No alternatives, other than the Proposed Action, were carried forward for analysis for projects subjected to programmatic analysis. The programmatic analysis was based on analysis of the likely maximum potential impacts of the considered activities on a broad scale. Because detailed analysis was not possible, due to the generally undefined nature of these activities, they would be subjected to site-specific NEPA analysis prior to implementation.

While the analysis in this FPEIS addresses all the proposed component projects, the final decision may be to implement only a subset of the Proposed Action components. The U.S. Army has the option of selecting only certain of the proposed construction, testing, and training activities for implementation, and to re-evaluate options at a future time. It also is possible and likely that some selected projects would not be implemented due to changes in needs or technology

ES.4 Comparison of Environmental Consequences of the Proposed Action and Alternatives and Summary of Mitigation Measures

A summary of potential impacts from implementation of the Proposed Action and No Action Alternative is presented in Table ES-1 along with a brief summary of measures that would be implemented to minimize or mitigate potential negative effects.

ES.5 Preferred Alternative

The U.S. Army has given consideration to input from government agencies and tribal organizations and has determined that the Preferred Alternative is to implement a subset of the Proposed Action as shown on Figures 2-16, 2-17, and 2-18 and the Preferred Alternative includes:

- Implement proposed activity L030b, the smaller of the two considered Light Maneuver Training Areas (LTAs), rather than proposed activity L030-a. This option was selected to minimize potential impacts after discussions with agencies and tribal organizations.
- Implement Option 1 for proposed activity L031. While there is no meaningful difference in the potential impacts of the considered alternative, this option was selected based on mission-related input.
- Implement Option 1 for proposed activity L034. While there is no meaningful difference in the potential impacts of the considered alternative, this option was selected based on mission-related input.
- Implement a reduced area for proposed activity C034-a, reducing the area of the expanded Graze Range munitions impact area and avoiding potential impacts to a known resource. This option was selected to minimize potential impacts after discussions with agencies and tribal organizations.
- Implement a reduced area for proposed activity K003, establishing the northern boundary of the expanded munitions impact area even with the northern boundary of the Ramsdell Ranch Advanced Munitions Range (1,000 meters [m] south of the boundary of Kofa NWR) and setting the western boundary of the expanded munitions

impact area parallel to and 500 m east of the boundary of Kofa NWR. This option was selected to minimize potential impacts after discussions with agencies and tribal organizations.

- Implement proposed activity K024 rather than proposed activity C066. K024 would have less environmental impacts compared with C066 and this option is preferred based on mission-related input.
- Implement a reduced area for proposed activity K026 (1,826 acres less than originally proposed), establishing the northern boundary of the LTA even with the northern boundary of the Ramsdell Ranch Advanced Munitions Range (1,000 m south of the boundary of Kofa NWR). This option was selected to minimize potential impacts after discussions with agencies and tribal organizations.
- Implement the remainder of the Proposed Action, as proposed.

TABLE ES-1

Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed

Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
Air Quality	No change from existing conditions. Benefits from reduced use of portable generators would not occur.	<p>Minor impacts from increased emissions due to operation of minor permanent sources of air emissions, operation of new facilities, vehicle operation to travel to new facilities, and testing and training activities in new locations.</p> <p>Temporary negative impacts due to fugitive dust from construction. Minor short-term impacts to local air quality as a result of emissions from construction equipment.</p> <p>Minor to moderate impacts from increased UAS testing.</p> <p>As noted under Energy/Utilities, there would be a reduction in portable generator use on ranges after the installation of hard power and telecommunications, which would produce minor benefits to air quality from reduced generator emissions following.</p> <p>Title V permit modification for the expansion of the sandblasting area will be required under Arizona Department of Environmental Quality regulations and Title V monitoring, recordkeeping, and reporting will be required.</p> <p>Monitoring, recordkeeping, and reporting will be required by the Title V permit for POL storage facilities and for construction activities.</p>	<p>Construction best management practices (BMPs) would minimize fugitive dust emissions.</p> <p>BMPs that could be implemented include the following:</p> <ul style="list-style-type: none"> • <i>Application of Dust Suppressants.</i> Where appropriate, dust suppressants or liquid surfactants would be applied to areas where dust could be disturbed by construction or traffic. • <i>Sprinkling/Irrigation.</i> Sprinkling the ground surface with water until it is moist can be used to control dust on haul roads and other traffic routes. This practice can be applied to almost any site. When suppression methods involving water are used, care would be exercised to minimize over-watering that could cause the transport of mud onto adjoining roadways, which ultimately could increase the dust problem. Mechanical removal of mud from tires would be implemented if necessary. • <i>Vegetative Cover.</i> In areas not expected to accommodate vehicle traffic, vegetative stabilization of disturbed soil is often desirable. Vegetation provides coverage to surface soils and decreases wind velocity at the ground surface, thus reducing the potential for dust to become airborne. • <i>Mulch.</i> Mulching can be a quick and effective means of dust control for recently disturbed areas.
Airspace	No change from existing conditions.	No change from existing conditions.	YPG will continue coordination with Marine Corps Air Station (MCAS) Yuma and private/commercial

TABLE ES-1
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Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
Management			air traffic controllers.
Cultural Resources	<p>Potential impact from inadvertent discovery of cultural resources during testing or training activities at current approved locations and levels will be addressed through the inadvertent discovery process specified in the ICRMP.</p> <p>Potential for damage to cultural resources from vandalism. As appropriate, surveys, State Historic Preservation Office (SHPO) consultation under the National Historic Preservation Act (NHPA), and mitigation would be implemented.</p> <p>Any ground-disturbing activity would stop until completion of the inadvertent discovery process</p>	<p>Potential impact from inadvertent discovery of cultural resources during ongoing activities.</p> <p>Potential impacts to cultural resources in areas not previously surveyed. As appropriate, surveys, SHPO consultation under the NHPA, and mitigation would be implemented.</p> <p>Potential for minor to moderate impacts from construction and training activities and from increased potential for inadvertent discovery due to increase in area where activities would be implemented. Implement inadvertent discovery process as appropriate for all YPG regions.</p> <p>Potential for damage to cultural resources from vandalism.</p>	<p>Implement the inadvertent discovery process specified in the Integrated Cultural Resources Management Plan (ICRMP) as appropriate.</p> <p>Avoidance of areas with known significant sites or areas with paleobotanical resources, especially petrified wood.</p> <p>Protect sites and monitor protection measures by modifying project designs if necessary.</p> <p>For areas proposed for activities where previous cultural resource surveys have not been conducted, YPG may implement measures, including surveys, tribal consultation, compliance with stipulations in the Section 106 programmatic agreement (PA), and activity-specific NEPA analysis.</p> <p>Implement Environmental Awareness Training for persons working in areas where paleobotanical resources may occur.</p> <p>Implement data recovery in case of unavoidable impacts to paleobotanical resources.</p>
Energy/Utilities	<p>Portable generators would continue to be used at current levels and locations.</p> <p>Continued use of utilities at current levels.</p> <p>Continued use of bottled water and individual reverse osmosis systems outside of the Main Administrative Area (MAA).</p> <p>Satellite uplinks powered by portable generators would continue to be</p>	<p>Energy/Electricity</p> <p>Beneficial impacts from construction of more energy-efficient buildings.</p> <p>Energy demand would fluctuate depending on annual testing and training needs, with potential for minor to moderate impacts to energy use in the region in years of high levels of testing and training.</p> <p>Minor beneficial impacts from use of solar-powered lights. Moderate long-term beneficial impacts to regional energy consumption</p>	<p>Incorporate energy efficient design into new buildings.</p> <p>Use solar lights where practicable.</p> <p>Install hard power to additional locations to reduce reliance on diesel-powered generators at testing and training locations.</p> <p>Recycle and reuse to the extent practicable.</p>

TABLE ES-1

Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
	<p>used for telecommunications.</p> <p>Benefits from reduced use of portable generators would not occur.</p> <p>No change from existing conditions for solid waste. No significant increase in non-hazardous waste is anticipated to occur. No significant impacts to the non-hazardous waste landfill capacity would be anticipated.</p> <p>Potential for conflicts in scheduling multiple users with needs to conduct testing in areas free of electromagnetic interference from cellular/radio towers.</p>	<p>following installation of hard power and telecommunications lines with associated reduction in the use of portable generators.</p> <p>Minor beneficial impacts to air quality from reduced emissions and to hazardous materials management from reduced transport and handling of fuels following installation of hard power to testing and training locations with associated reduction in generator use.</p> <p>Water Minor indirect impacts to surface water from construction stormwater runoff; no impacts to groundwater.</p> <p>Wastewater New evaporative lagoon at Castle Dome Heliport and new sewage lagoon at Kofa cantonment area would have minor beneficial impacts on wastewater utilities.</p> <p>Telecommunications Minor beneficial impacts to air quality from reduced emissions and to hazardous materials management from reduced transport and handling of fuels following installation of hard power to testing and training locations with associated reduction in use of generators and satellite uplinks. Greater flexibility in scheduling users needing test areas free of electromagnetic interference.</p> <p>Solid Waste No significant increase in non-hazardous waste is anticipated to occur. No significant impacts to the non-hazardous waste landfill capacity or regional construction and demolition landfills are anticipated.</p>	

TABLE ES-1
Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
Environmental Justice and Protection of Children	No change from existing conditions.	No changes from existing conditions and no impacts.	No mitigation measures are proposed for this resource area.
Fire Management	<p>No change from existing conditions. The potential for wildfires would continue and fire management activities would continue.</p> <p>Fire management from new EOC in the Laguna Region would not occur. YPG will implement the Terms and Conditions specified in the September 9, 2014 Biological Opinion (BO) from USFWS that pertain to fire management in the Kofa Region.</p>	<p>Minor increase in potential for wildfires due to increased testing and training locations.</p> <p>Minor to moderate potential for increased fuel load from growth of exotic invasive plant species.</p> <p>New EOC in the Laguna Region would benefit fire management.</p> <p>YPG will implement the Terms and Conditions specified in the September 9, 2014 BO from USFWS that pertain to fire management in the Kofa Region.</p> <p>To the extent practicable, testing and training would occur away from areas with high fire risk.</p>	<p>Develop and implement program to monitor invasive plants.</p> <p>Continue implementation of Integrated Training Area Management (ITAM).</p> <p>Coordinate with Bureau of Land Management (BLM), Kofa NWR, and U.S. Forest Service on fire management strategies. Develop and interpret wildfire data with other agencies.</p> <p>Use Geographic Information System (GIS) fire risk model to identify areas of high fire risk and incorporate into range operations as practicable.</p> <p>The following Terms and Conditions from the USFWS BO of September 9, 2014 will be implemented:</p> <p>1a. YPG shall monitor environmental conditions on the Kofa Range, including weather patterns and status of fuels including distribution and density of annual vegetation and additional fire-causing vegetation.</p> <p>2a. YPG shall, subject to availability of funds and where compatible with the military mission, continue to maintain a fire department with wildland firefighting capabilities. Additionally, YPG shall, subject to availability of funds and where compatible with the military mission, continue to maintain a fire station on the KFR.</p> <p>2b. Should YPG detect exceptional fuel conditions that are conducive to carrying fire,</p>

TABLE ES-1

Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed

Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
			<p>then YPG shall do the following to increase fire readiness: (1) provide additional fire briefings to test officers, and (2) maintain fire break infrastructure where such infrastructure is compatible with the military mission and pronghorn conservation that is anticipated to reduce the risk of fire spreading to Kofa NWR.</p> <p>3a. YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to USFWS-AESO and Kofa NWR as soon as possible. The report (can be in the form of an email) will, at a minimum, include the date(s), acreage, and location(s) of the fire(s), as well as the number of pronghorn in the vicinity of the fire, if known. YPG shall also immediately notify Kofa NWR once aware that a fire has encroached or may encroach onto the refuge.</p>
Geological Resources	No change from existing conditions.	No change from existing conditions and no impacts.	No mitigation measures are proposed for this resource area.
Hazardous Materials/ Hazardous Waste	<p>No change from existing conditions. No changes in volumes of hazardous materials used or hazardous wastes generated. Potential for leaks from on-road and off-road vehicle use and maintenance, POL spills, and chemical decomposition of munitions constituents of concern (MCOCs) would remain.</p> <p>YPG will continue to conduct regular range assessments to determine the potential for migration of MCOCs. YPG would implement appropriate measures should off-range migration</p>	<p>Impacts and sampling, as described for the No Action Alternative, would occur, plus additional potential for minor impacts from leaks associated with vehicle use and maintenance, POL spills, and chemical decomposition of MCOCs in new and expanded testing and training areas.</p> <p>Minor short-term increase in hazardous waste generation due to demolition of buildings containing asbestos-containing materials (ACMs).</p> <p>Potential for minor impacts from use and disposal of certain hazardous materials during</p>	<p>Continue management of handling and disposal of hazardous materials using existing programs and guidance. Activities would comply with the BMPs identified in the Spill Prevention, Control, and Countermeasures Plan (SPCCP) and Installation Spill Contingency Plan (ISCP).</p> <p>YPG will continue to conduct regular range assessments to determine the potential for migration of MCOCs. YPG would implement appropriate measures should off-range migration that could affect human health or the environment be indicated.</p> <p>Appropriate protective measures would be taken if</p>

TABLE ES-1
Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
	that could affect human health or the environment be indicated.	<p>testing and training activities in new areas.</p> <p>Potential for impacts from installation of air conditioning components.</p> <p>Minor beneficial effects from construction of appropriate down-range facilities to store and contain POLs and reduce the potential for spills.</p> <p>Minor beneficial effects from installation of hard power and telecommunications to testing and training sites that would reduce use of portable generators and would reduce the transport of fuel.</p>	<p>construction were to occur in a previously contaminated area. Any contaminated soils encountered during construction would be removed and properly disposed of in accordance with appropriate regulations.</p> <p>Appropriate protective procedures would be implemented to reduce potential exposure to ACM and to dispose of ACM.</p> <p>The YPG SPCCP and ISCP would be implemented to minimize potential for impacts from accidental spills.</p> <p>If an inadvertent discovery of unexploded ordnance (UXO) occurs, a qualified individual would assess the situation and implement appropriate disposition.</p> <p>1996 Federal Regulations require Class I or II refrigerants for new air conditioning equipment. YPG will procure non-ozone depleting chemicals refrigerants for new air conditioning components.</p>
Land Use	No change from existing conditions.	<p>Minor changes from conversion of open space to other uses, but consistent with military land uses.</p> <p>The slight changes in the noise zones that may result from large artillery testing would not require any changes to the land uses designated in the Yuma County 2020 Comprehensive Plan.</p>	Continue to coordinate and participate with local plans to avoid incompatibilities with adjacent lands.
Noise	<p>No change from existing conditions. Continued sporadic impacts to wildlife from noise during testing and training activities.</p> <p>Continued potential for complaints</p>	<p>The slight changes in the noise zones that may result from large artillery testing would not affect use of surrounding lands outside the installation boundary.</p> <p>Minor long-term impact on wildlife from</p>	<p>Use of appropriate hearing protection by construction and YPG workers when working with or around machinery and equipment.</p> <p>Maintain aircraft operations in compliance with established Air Installation Compatible Use Zone.</p>

TABLE ES-1

Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
	from the Martinez Lake area.	<p>disturbance from sporadic noise from activities in new or expanded testing and training areas.</p> <p>Minor temporary impact to wildlife from noise due to construction activities.</p> <p>Potential for minor disturbance of outdoor conversations due to construction noise. No permanent sensitive human receptors in proximity to construction areas.</p>	<p>Locate noise-generating activities away from sensitive receptors and use natural barriers to the extent practicable.</p> <p>Enclose small caliber ranges with berms or walls to reduce noise propagation.</p> <p>Conduct noise-intensive activities during favorable weather conditions where feasible.</p> <p>Implement fly-neighborly programs.</p> <p>Adjust timing of potentially disruptive activities.</p> <p>Inform the public of unusual increases in intensity of testing and training.</p> <p>Establish safety zones and hazardous noise areas, as needed, and use noise level meters and warning signs to reduce human exposure.</p> <p>Continue the noise complaint management procedure.</p>
Recreation	<p>No change from existing conditions.</p> <p>No new recreation facilities would be constructed.</p>	<p>No impacts to off-post recreation.</p> <p>Potential for minor to moderate impacts to recreational hunting in the Cibola Hunting Area, Martinez Hunting Area, and the East Arm Hunting Area due to expanded testing and training areas.</p> <p>Beneficial impacts to other on-post recreation from construction of new park, youth center addition, and improvements to other passive recreational opportunities.</p> <p>Loss of greenspace in MAA that is used by residents for passive recreation from Cox Field improvements.</p> <p>Potential disruption of some on-post recreation during construction.</p>	No mitigation is proposed for this resource area.

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Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
Safety	<p>No change from existing conditions. Safety benefits that would result from the Proposed Action would not occur.</p> <p>Potential for recreational users in southern portion of Kofa NWR in YPG Airspace R-2307 to be within safety fans (the area established around the impact point with a probability of a round landing outside the safety fan being one in one-million) for operations and at risk.</p>	<p>Potential for minor increase in safety incidents due to implementing activities in the new or expanded testing and training areas, but the rate of incidents (expressed per worker hour) would not be expected to change.</p> <p>Minor potential increase in frequency of wildfire ignition due to implementing activities in new or expanded testing and training areas.</p> <p>Potential for minor short-term impacts to construction worker safety.</p> <p>Potential minor temporary impacts to traffic safety due to construction-related traffic.</p> <p>Moderate benefits to operational safety due to AT/FP improvements, MEDEVAC helicopter pads, flood upgrades on Aberdeen Road, pedestrian safety from D Street conversion to walkway, and installation of shading at multiple locations.</p> <p>Minor benefit to personnel safety from installation of hard power and telecommunications in the Cibola and Kofa Regions due to decreased transportation of fuel and portable generators.</p> <p>Minor benefit to personnel safety due to reduced heat stress following installation of new shade structures.</p> <p>Minor benefit to safety from placing overhead wires underground.</p> <p>Moderate benefit from relocating safe haven away from YPG personnel.</p> <p>Potential for recreational users in southern portion of Kofa NWR in YPG Airspace R-2307</p>	<p>Workers involved with construction would use appropriate protection measures and adhere to Occupational Safety and Health Administration (OSHA) requirements and guidelines to minimize and reduce safety incidents.</p> <p>YPG and military personnel would implement the YPG safety program to minimize risk and potential for safety incidents.</p> <p>Each testing and training activity would have specific safety protocols that would be adhered to.</p> <p>Use GIS fire risk model to identify areas of high fire risk and incorporate into range operations as practicable.</p> <p>YPG will verify there are no people in the portion of a Safety Danger Zone (SDZ) extending into the Kofa NWR, primarily by visual or electronic means. Helicopters will be used to locate people only where large portions of an SDZ overlap Kofa NWR, primarily in R-2307.</p>

TABLE ES-1

Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
		to be within safety fans for operations and at risk.	
Socioeconomics	No change from existing conditions. Short-term benefits to local economy from construction would not occur.	<p>Minor short-term beneficial impacts to local economy from purchase of building materials, short-term construction jobs, and secondary spending by construction workers.</p> <p>Potential for negligible to minor impacts on local fuel and water retailers from reduction in demand for these services on YPG.</p>	No mitigation measures are proposed for this resource area.
Soils	No change from existing conditions. Continued impacts to soils from testing and training activities at authorized locations and levels.	<p>Impacts described for the No Action Alternative would continue, but with increased potential for impacts due to implementation of activities in new or expanded testing and training areas.</p> <p>Increase in disturbed area and disturbance to soils used for dismounted maneuver training, munitions impact areas, DZs, and unmanned aircraft system (UAS) launch/recovery areas resulting in moderate impacts to highly erodible soils that are disturbed and negligible to minor impacts to disturbed soils that are classified as not highly erodible to moderately erodible.</p> <p>Minor impact from establishment of transient gun positions (TGPs) in the Cibola Region.</p> <p>Long-term indirect impact from degradation of munitions into soils in munitions impact areas.</p> <p>Disturbance due to construction resulting in moderate impacts to highly erodible soils in construction areas and negligible to minor impacts to construction area soils that are classified as not highly erodible to moderately</p>	<p>Planning, site selection, and site design would include criteria to avoid the disturbance of highly erodible soils.</p> <p>Implement construction BMPs to minimize the potential for onsite erosion.</p> <p>Implement post-construction stormwater controls to reduce the long-term potential of erosion and sedimentation from proposed construction sites.</p> <p>Continue implementation of ITAM and the Integrated Natural Resource Management Plan (INRMP) to reduce potential to impact soils through proper land management.</p> <p>Continued implementation of ITAM and the Integrated Natural INRMP would reduce potential for incremental interaction among multiple projects on YPG.</p>

TABLE ES-1
Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
		erodible. Minor impacts from disturbance to soils during installation of utilities.	
Threatened and Endangered Species and Species of Concern	<p>No change from existing conditions. Potential for minor impacts to threatened, endangered, or sensitive (TES) species, including potential for injury or mortality to Sonoran Pronghorn on Kofa NWR from firing, as testing and training activities continue at existing locations and levels.</p> <p>YPG implements those portions of the Arizona Interagency Desert Tortoise Team <i>Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat</i> that are consistent with the military mission and will consult with USFWS on projects that may affect desert tortoise should the species be listed.</p> <p>YPG will consult with USFWS on any proposed activities that may affect the Sonoran pronghorn on the Kofa NWR.</p> <p>Continued coordination with AZGFD for necessary rehabilitation of injured animals, including TES species.</p>	<p>Disturbed soils may increase encroachment of invasive plant species, which could lead to less water for TES species</p> <p>Transient or Incidental Species Negligible to minor impacts likely from displacement during construction, testing, or training activities.</p> <p>Sonoran Desert Tortoise Long-term moderate impacts from loss of habitat and potential for incidental mortality.</p> <p>Sonoran Pronghorn Minor long-term impacts from visual and auditory disturbance to the experimental population due to testing and training activities. Potential threat to individual pronghorn from munitions testing or UXO. Potential alteration of foraging habitat in the event of wildfire. YPG will consult or conference, as appropriate, with USFWS for impacts that may affect Sonoran pronghorn</p> <p>Banded Gila Monster Minor long-term impacts from loss of habitat and disturbance from construction, testing, and training activities.</p> <p>TES Bat Species Negligible to minor long-term impacts due to loss of foraging habitat.</p> <p>Loggerhead Shrike Moderate long-term impacts from loss of</p>	<p>To the extent practicable, avoid known sensitive habitats, water sources, and areas where sensitive species occur during project siting.</p> <p>Schedule construction projects to avoid or minimize conflicts with reproduction.</p> <p>Schedule construction outside the nesting and denning period, when practicable. Relocate TES species if proposed activity could not be relocated. If possible, delay disturbance until after young of mobile species have fledged or departed the area.</p> <p>YPG implements those portions of the Arizona Interagency Desert Tortoise Team <i>Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat</i> that are consistent with its mission and will consult with USFWS on projects that may affect desert tortoise should the species be listed. If an activity is planned that would harm desert tortoise or threaten an active tortoise burrow, YPG would handle or relocate the tortoise according to the Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects.</p> <p>Relocate or deter species to minimize impacts if necessary; implement INRMP procedures.</p> <p>Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.</p> <p>Should the Sonoran desert tortoise be listed under the Endangered Species Act (ESA), then activities proposed in areas where the tortoise may occur on YPG would be re-evaluated with regard to potential</p>

TABLE ES-1

Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
		<p>habitat and disturbance caused by construction, testing, and training activities.</p> <p>Western Burrowing Owl Moderate long-term impacts due to loss of habitat and disturbance from construction, testing, and training activities.</p> <p>Parish's Onion Negligible to minor long-term impacts from incidental mortality and due to the slow growth rate of these species.</p> <p>Other TES Plants Minor long-term impacts from clearing of vegetation for construction, testing, and training purposes.</p> <p>Wild Horses and Burros Minor temporary impacts due to construction activities. Minor long-term impacts due to displacement and loss of habitat from establishment of new or expanded testing and training areas.</p> <p>No impacts to other species.</p>	<p>impacts and appropriate consultation with the USFWS would be conducted prior to any land-disturbing activities. YPG will comply with the Reasonable and Prudent Measures with implementing Terms and Conditions of the USFWS BO regarding activities that may affect the Sonoran pronghorn on Kofa NWR:</p> <p>1a. YPG shall monitor environmental conditions on the Kofa Range, including weather patterns, distribution and density of annual vegetation and additional fire-causing vegetation.</p> <p>2a. YPG shall, subject to availability of funds and where compatible with the military mission, continue to maintain a fire department. Additionally, YPG shall, subject to availability of funds and where compatible with the military mission, continue to maintain a fire station on the KFR to provide rapid response on the Kofa Range in the event of fire.</p> <p>2b. Should YPG detect exceptional fuel conditions that are conducive to carrying fire, then YPG shall increase fire readiness by (1) providing additional fire briefings to test officers, and (2) subject to availability of funds, maintaining fire break infrastructure where such infrastructure is compatible with the military mission and pronghorn conservation and is anticipated to reduce the risk of fire spreading to Kofa NWR.</p> <p>3a. YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to USFWS-AESO and Kofa NWR as soon as possible. YPG shall also immediately notify</p>

TABLE ES-1
Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
			<p>Kofa NWR once aware that a fire has encroached or may encroach onto the refuge.</p> <p>Conservation measures that are included in the Proposed Action that would be implemented by YPG include:</p> <ul style="list-style-type: none"> • Implement the 2014 Final Incident Response Protocol for Sonoran Pronghorn. • Avoid placing activities in proximity to artificial water sources (suitable for Sonoran pronghorn) to the extent that such action is consistent with the military mission. • YPG will adhere to the terms of the Memorandum of Understanding between the Kofa NWR, Imperial NWR, BLM, and YPG, which provides procedures and guidance for cooperation and collaboration on wildland fire issues. This includes notifying interagency dispatch of any wildfire on YPG lands.
Traffic/ Transportation	No change from existing conditions. No new impacts would occur.	<p>Potential increase in temporary road closures and construction-related traffic. Minor short-term impact.</p> <p>Long-term beneficial impacts from improved traffic safety due to flood upgrades, intersection improvements, and range road improvements.</p> <p>Long-term benefits to mission from increased efficiency of military air activities due to new infrastructure.</p>	Use of appropriate traffic control procedures, which may include detours, timing of construction to avoid peak traffic volume times, and use of flaggers would minimize disruption of traffic flow.

TABLE ES-1
Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
Vegetation	No change from existing conditions. Continued impacts to vegetation from testing and training activities at current locations and levels.	Minor to moderate impacts due to removal of vegetation for construction, creation of new or expanded testing and training areas, and use of new munitions impact areas.	<p>Implement appropriate construction and post-construction stormwater controls to reduce scour from increased stormwater volume and flow rate.</p> <p>Use appropriate construction BMPs to stabilize soils and prevent erosion.</p> <p>Continued implementation of the INRMP and ITAM program to maintain vegetation and reduce spread of invasive plants in training area.</p> <p>Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.</p>
Visual Resources	No change from existing conditions. Current testing and training activities would continue to have negligible to minor impacts to visual resources.	<p>Temporary minor impacts from construction-related airborne dust.</p> <p>Recurring temporary minor impacts from dust and other obscurants caused by testing and training.</p> <p>Potential long-term minor impacts from increased use of lighter-than-air UASs.</p> <p>Potential minor long-term impacts from appearance of new buildings.</p>	<p>Dust suppression and other construction BMPs to minimize airborne dust and other visual obscurants during construction.</p> <p>Design new buildings to blend with the existing visual landscape.</p> <p>Continue to implement Environmental Awareness program to minimize potential impacts to areas of aesthetic and visual value during ground-based testing and training activities.</p>
Water Resources	Continued impacts from contaminants and water consumption due to testing and training activities at current locations and levels.	<p>Potential temporary minor adverse impacts to water quality resulting from sediment runoff during construction and an increase in impervious surfaces following construction</p> <p>Minor to moderate increased potential for impacts to groundwater from degradation of munitions.</p> <p>Minor potential for offsite impacts due to transport of contaminants and sediments generated from stormwater runoff on new or expanded testing and training areas.</p> <p>Potential negligible reduction in groundwater</p>	<p>Implement construction and post-construction stormwater controls to reduce runoff, facilitate infiltration, and reduce potential for scour.</p> <p>Develop and implement Construction Stormwater Pollution Prevention Plans to reduce potential for environmental exposure to pollutants in stormwater.</p> <p>Implement mitigation and protective measures associated with any Clean Water Act Section 404 permit/Section 401 Water Quality certification prior to construction in jurisdictional waters.</p>

TABLE ES-1
Comparison of Environmental Impacts of Alternatives and Mitigation Measures Proposed
Yuma Proving Ground

Resource Area	No Action	Proposed Action/ Preferred Alternative	Mitigation ^a
		recharge rates due to new impervious area.	Continue implementation of the INRMP.
Wildlife and Fisheries	No change from existing conditions. Minor impacts to wildlife would continue under current levels of testing and training activities at current locations.	<p>Minor short-term impact from incidental mortality, displacement, and disturbance due to construction.</p> <p>Potential for minor to moderate long-term impacts from incidental mortality, displacement, and disturbance due to creation and use of new or expanded testing and training areas.</p> <p>Minor to moderate long-term indirect impacts from loss of habitat due to construction, UAS launch/recovery areas, utilities, and TGPs.</p> <p>Minor impacts from disturbance of habitat due to use of DZs.</p>	<p>Avoid wildlife concentration areas and sensitive habitats when selecting locations for activities where possible.</p> <p>Schedule construction outside the nesting and denning period, when practicable.</p> <p>Continue to implement the INRMP to maintain wildlife habitat needs and wildlife movement corridors.</p> <p>Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.</p>

^a Mitigation includes avoidance and minimization measures, including BMPs, in addition to rehabilitation/restoration, preservation/maintenance, and compensatory/substitution activities.

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Acronyms and Abbreviations

AAC	Arizona Administrative Code
ABC	aggregate base coat
ac	acre
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ACP	access control point
ADNL	A-weighted day-night average noise level
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AERC	Arizona Emergency Response Commission
AES	Arizona Ecological Services
AESO	Arizona Ecological Services Office
AGL	above ground level
AMC	Army Materiel Command
AMC-R	Army Materiel Command Regulation
AR	Army Regulation
Army	United States Army
ASET	Aviation Systems and Electronic Test
AST	aboveground storage tank
AT/FP	antiterrorism/force protection
AZ	Arizona
AZGFD	Arizona Game and Fish Department
AZPDES	Arizona Pollutant Discharge Elimination System
B&V	Black and Veatch Corporation
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
BO	biological opinion

BSA	Boy Scouts of America
C5ISR	command, control, communications, computers, combat systems, intelligence, surveillance, and reconnaissance
CA	California
CAA	Clean Air Act
CACTIS	Compact Automatic Centroid Tracking Instrumentation System
CALA	Combat Aircraft Loading Area
CASQA	California Stormwater Quality Association
C&D	construction and demolition
CDA	Castle Dome Annex
CDC	Centers for Disease Control and Prevention
CDH	Castle Dome Heliport
CDNL	C-weighted average day-night noise level
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH ₄	methane
CALFEX	Combined Arms Live Fire Exercise
CM	camera mount
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	CO ₂ equivalents
Colorado Desert	Lower Colorado River Valley Subregion of the Sonoran Desert
CRAM	Counter-Rocket Artillery and Mortar
CSW	Crew Served Weapon
CWA	Clean Water Act
CREW	Counter-Radio Controlled Improvised Explosive Device Electronic Warfare
D.A.R.E.	Drug Abuse Resistance Education
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DET/REC	Detection and Recognition Target Array

DFAC	Dining Facility
FPEIS	Draft Final Programmatic Environmental Impact Statement
Dish Stirling	dish-engine system based on the Stirling thermodynamic cycle
DoD	Department of Defense
DoDI	Department of Defense Instruction
DPW	Directorate of Public Works
DU	depleted uranium
DZ	drop zone
EA	Environmental Assessment
ECMD	Electromagnetic Counter Measure Device
ECUT	Engineering Common Use Test
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007
EM	electromagnetic
EO	Executive Order
EOC	Emergency Operations Center
EPCRA	Emergency Planning and Community Right-to-Know Act
EQSD	explosive quantity safety distance
ESA	Endangered Species Act
EUL	enhanced use lease
EW	electronic warfare
FARP	Forward Area Arming and Refuel Point
FCS	Future Combat Systems
FOB	Forward Operating Base
FPEIS	Final Programmatic Environmental Impact Statement
ft	foot
ft ²	square feet
GCS	ground control station
GHG	greenhouse gas
GIS	Geographic Information System
GMU	Game Management Unit
GOV	government-owned vehicle
GP	gun position

gpd	gallons per day
H ₂ O	water
HAPs	hazardous air pollutants
HAZMART	Hazardous Material Control Center
HE	high explosive
HFCs	hydrofluorocarbons
HMTA	Hazardous Material Transportation Act
HSMS	Hazardous Substances Management System
HWSF	Hazardous Waste Storage Facility
HWTS	hazardous waste tracking system
I-8	Interstate Highway 8
I-10	Interstate Highway 10
ICRMP	Integrated Cultural Resources Management Plan
ICUZ	Installation Compatible Use Zone
IED	improvised explosive device
IMCOM	U.S. Army Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IONMP	Installation Operational Noise Management Plan
IR	infrared
IRCC	Inverted Range Control Center
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
ISR	intelligence, surveillance, and reconnaissance
ISR/EO	intelligence, surveillance, and reconnaissance/electro-optical
ITAM	Integrated Training Area Management
IVTS	Improved Vehicle Tracking System
JERC	Joint Experimentation Range Complex
JPADS	Joint Precision Airdrop System
JPMO	Joint Program Management Office
JTTR	Joint Test Tunnels Range
KADS	Kofa Deflagration Site
KFR	Kofa Firing Range
kV	kilovolts

LAAF	Laguna Army Airfield
LAW	light antitank weapon
lb	pound
LBP	lead-based paint
LCPA	Lower Colorado Planning Area
lf	linear feet
LID	low-impact development
LPWS	Land-Based Phalanx Weapon System
LRA	Long Range Artillery
LTA	Light Maneuver Training Area
LWC	low water crossing
MAA	Main Administrative Area
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCD	Mine Countermine and Demolitions
MCOC	munitions constituent of concern
MEDEVAC	medical evacuation
MFFS	Military Freefall School
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mm	millimeters
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOUT	military operations in urban terrain
mph	miles per hour
MPRC	Multi-Purpose Range Complex
MRAP	Mine Resistant Ambush Protected
MSDS	Material Safety Data Sheet
msl	mean sea level
MTI	Moving Target Indicator
MW	megawatt
MWD	military working dog

MW-h	megawatt-hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
N ₂ O	nitrous oxide
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NRCD	Natural Resource Conservation District
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
NZ	Noise Zone
O ₃	ozone
OB/OD	open burn/open detonation
ODCs	ozone-depleting chemicals
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PAO	Public Affairs Office
PCB	polychlorinated biphenyl
PEIS	Programmatic Environmental Impact Statement
PEPs	propellants, explosives, and pyrotechnics
PFCs	perfluorocarbons
PK	peak or maximum, single event sound level measurement without weighting
PK15 (met)	peak sound level, using statistical variations caused by weather that is likely to be exceeded only 15 percent of the time
PM ₁₀	particulate matter less than or equal to 10 micrometers in diameter
PM _{2.5}	particulate matter less than or equal to 2.5 micrometers in diameter
POL	petroleum, oil, and lubricants
POV	privately owned vehicle

ppb	parts per billion
ppm	parts per million
PSS	Persistent Surveillance Systems
PTDS	Persistent Threat Detection System
PV	photovoltaic
PVC	polyvinyl chloride
RACM	Reasonably Available Control Measure
RCIED	radio controlled improvised explosive device
RCRA	Resource Conservation and Recovery Act
RDTE	Research, Development, Test, and Evaluation
RO	reverse osmosis
ROD	Record of Decision
RPG	rocket-propelled grenade
RPMP	Real Property Master Plan
RSTA	reconnaissance, surveillance, and target acquisition
RV	recreational vehicle
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SDS	Sonoran Deflagration Site
SDZ	Safety Danger Zone
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
SOTACC	Special Operations Terminal Attack Controller Course
SO ₂	sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SWPPP	Stormwater Pollution Prevention Plan
SR	State Route
SVOCs	semivolatile organic compounds
SWMU	solid waste management unit
SWTR	Smart Weapons Test Range
TEMO	Training Exercise Management Office
TES	threatened, endangered, or sensitive

TCP	Traditional Cultural Property
TGP	transient gun position
TM	telemetry
TOW	Tube-launched, Optically Tracked, Wire Command
tpy	tons per year
TSCA	Toxic Substances Control Act
UAS	unmanned aircraft system
UAV	unmanned aerial vehicle
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Command
US 95	U.S. Highway 95
USACHPPM	U.S. Army Center for Health Promotion and Preventative Medicine
U.S. Army	United States Army
USASOC	U.S. Army Special Operations Command
USCB	U.S. Census Bureau
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UV	ultraviolet
UXO	unexploded ordnance
VEC	valued environmental component
VOCs	volatile organic compounds
WAPA	Western Area Power Administration
WP	white phosphorus
WSC	Wildlife of Special Concern in Arizona
WTI	Weapons Tactics Instructors
WTP	water treatment plant
YDNL	yearly day-night average noise level
YMPO	Yuma Metropolitan Planning Organization
YPG	Yuma Proving Ground

YPG HP	Yuma Proving Ground Hunting Program
YPGR	Yuma Proving Ground Regulation
YTC	Yuma Test Center

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Purpose and Need for the Proposed Action

1.1 Introduction

This Draft Final Programmatic Environmental Impact Statement (FPEIS) analyzes the direct, indirect, and cumulative effects of current and planned activities and operations at United States (U.S.) Army Yuma Proving Ground (YPG). This FPEIS analyzes construction, testing, and training activities and presents the direct, indirect, and cumulative effects of the Proposed Action to continue ongoing activities and to implement new facilities, infrastructure, and programs to meet anticipated future needs and maintain YPG as a multi-purpose installation that serves a broad customer base. The Proposed Action would also support cross-functional training allowed by the Department of Defense (DoD). The FPEIS will support development of a future Real Property Master Plan (RPMP) at YPG by providing a basis for the Visioning Plan and by providing a programmatic framework for the Capital Investment Strategy and the Area Development Plans. The analysis in the EIS also will support the alternatives analysis for the RPMP. This action would meet the changing needs of the U.S. military and would maintain YPG as a multi-purpose installation that performs a wide variety of missions.

Activities anticipated on YPG include construction and demolition of facilities and infrastructure, and changes to current types and levels of testing and training. This FPEIS addresses the following types of activities:

- Short-term, well-defined activities at known locations that could be implemented without additional National Environmental Policy Act of 1969 (NEPA) [42 United States Code (U.S.C.) 4321-4347] analysis once a decision is made. These activities are identified in the description of the Proposed Action in Tables 2-1, 2-3, and 2-5.
- Short-term, less well-defined activities for which locations are not known or for which additional information regarding site-specific implementation must be developed that would receive additional site-specific NEPA analysis prior to project implementation. These projects are identified in Tables 2-2, 2-4, and 2-6, with identifier numbers below 100.
- Long-term, less well-defined activities that would occur later in time and would receive additional site-specific NEPA analysis prior to project implementation. These projects are identified in Table 2-2, with identifier numbers of 100 and greater.

This document provides thorough analysis under NEPA for the short-term well-defined projects and allows other projects to be implemented following a focused, site-specific NEPA analysis that would tier from this analysis. This document will serve as a Programmatic Environmental Impact Statement (PEIS) for the longer-term projects per Title 40, Code of Federal Regulations 1502.20 (40 CFR 1502.20) and 32 CFR 651.14(c).

While many analyzed activities are assumed to occur at a specified location, future mission needs may require that one or more such activities be conducted in a different location or at

multiple locations. This programmatic analysis will provide a preliminary basis for subsequent focused NEPA analysis to allow YPG to conduct activities in areas that have not previously been specified for those activities. It is possible that activities analyzed in detail in this document may be changed prior to implementation. Should this occur, any activities that change prior to implementation will be subjected to additional NEPA analysis tiered from the analysis provided herein.

This document examines the activities that will occur or are likely to occur on YPG for the next several years. It is not always possible to predict accurately specific projects in specific years, but the U.S. Army is confident about the types of activities that will occur and the general technology trends that will establish the testing and training workloads in coming years; therefore, the Army is adopting a programmatic approach to this analysis to comply with NEPA and set the framework for future tiered documents if required. The analysis focuses on the anticipated impacts of categories of actions on the natural and human environment. Accordingly, the analysis examines military testing activities, military training activities, construction, and demolition, as appropriate for each activity.

The information and analysis in this FPEIS are presented in accordance with NEPA, the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA [40 CFR 1500 et seq.], U.S. Army Installation Management Command guidance (IMCOM Circular 200-10-1), and regulations issued by the DoD and the U.S. Army to implement CEQ regulations. 32 CFR Part 651 requires the integration of environmental considerations into U.S. Army planning and decision making (32 CFR §651.29).

Any activities and projects selected for implementation following analysis in this FPEIS will require additional evaluation and processing prior to implementation. Prior to implementation, specific project proponents must submit a work order (DA 4283) or service order and other required documents, such as a dig permit, for approval by YPG Environmental Services Division for the proposed project. Further, a specific proposed project may require Real Property Planning Board approval, additional NEPA review (as determined by this analysis), National Historic Preservation Act (NHPA) Section 106 consultation, or environmental permit applications, and state or federal regulatory agency approvals prior to implementation.

The Proposed Action, including alternatives for specific activities, is presented in detail in this document. Alternatives eliminated from consideration are summarized. If additional U.S. Army initiatives result in programs proposed for YPG that are not covered by this FPEIS, additional NEPA documentation would be prepared, as appropriate, in advance of implementing any such actions.

1.2 Purpose and Need

1.2.1 Purpose of the Proposed Action

The last EIS that addressed mission components on YPG was completed in 2001. New technologies and equipment and more powerful weapons and munitions are being developed for use by the U.S. military. Prior to use in combat, these technologies and items must be tested under realistic conditions comparable to what would be experienced in combat so that the Soldier can rely upon them. YPG is the premier hot, arid-environment year-round test center for the U.S. military and is responsible for determining the

performance and reliability of military vehicles, equipment, weapons, and munitions in these climatic conditions under test and operational scenarios.

The purpose of the Proposed Action is to enable YPG to continue to provide adequate facilities for military testing and training activities and for private industry partnerships that are capable of accommodating current and foreseeable technological advances. Testing activities include military ground and aerial vehicle systems, weapons, ammunitions, sensors, and guidance systems. YPG must provide realistic training for units, including but not limited to forward observer training, ground combat training, and operational training to provide real-world testing scenarios. The Army participates in private industry partnerships that are compatible with the military mission, such as the General Motors Test track where private vehicles and military vehicles both are tested for performance capabilities.

1.2.2 Need for the Proposed Action

Current testing and training facilities on YPG are inadequate to test emerging technologies, equipment, weapons, and munitions under appropriate conditions to meet military needs. Some facilities on YPG are outdated and the cost to rehabilitate or upgrade these facilities to meet current technology needs exceeds the cost of new construction. Constraints have been identified with the existing ranges, such as the testing of emerging weapons systems that require longer firing distances than current range configurations allow and scheduling conflicts over use of ranges and facilities due to high demand. Furthermore, during the decade following September 11, 2001, YPG experienced increased testing and training levels to support military activities in Afghanistan and Iraq in addition to normal testing and training activities and private industry partnerships. Analysis of range and airspace use during this period indicates that manned air sorties increased by 70 percent over baseline levels, while unmanned aircraft system (UAS) flights increased by 62 percent over baseline. Cargo airdrops increased by 93 percent and personnel airdrops increased by 120 percent over baseline. Ground combat training increased by 83 percent over baseline and the number of rounds fired increased by 90 percent. Vehicle and equipment testing on established tracks increased by 51 percent over baseline. Testing activities on the Cibola Range increased by 31 percent and testing on the Kofa Range increased by 15 percent. Operation at these levels resulted in over-utilization of existing facilities and ranges and even greater scheduling conflicts. Over-utilization of ranges and test facilities has reduced the efficiency of, or otherwise constrained, testing and training activities. The Proposed Action would allow YPG to develop appropriate facilities to meet the foreseeable fluctuations in future needs for year-round military testing and training. The overall need for the Proposed Action is to ensure the readiness of U.S. forces and materiel to meet the demands of theaters around the world, especially those in hot, arid environments. Construction of new buildings and infrastructure and modified or increased testing and training facilities would enable YPG to meet future military needs in response to changing conditions and technologies in the theater of combat. New buildings are needed to upgrade facilities that are unsuitable for modification to accommodate emerging military technologies, alleviate space limitations that can cause testing delays or inefficiencies, and allow more efficient alignment of personnel on YPG.

Electronic technology to aid the Soldier, including sensors, detection systems, rangefinders, and guidance systems, are continually being improved with regard to range, sensitivity, and

ability to overcome detection/intercept systems. In addition, technology to disrupt or disable an adversary's sensors and detection systems is being improved. The range and power of weapons tend to increase as systems are improved, resulting in a need for larger areas for testing and training. Combat vehicles and internal vehicle systems are being improved and enhanced. Some of these improvements are driven by internal technological advances derived from basic research, while others are driven as a response to new weapons or systems encountered on the field of battle. YPG must be able to adapt testing and training to address these technological changes as they arise to fulfill its mission.

Army Regulation (AR) 210-20 [*Real Property Master Planning for Army Installations*], requires installations to develop an RPMP as part of the Army master planning process. AR 420-1 integrates environmental considerations into the planning process. Many of the long-term projects analyzed programmatically in this FPEIS would likely be components of an RPMP that would be developed and adopted by the U.S. Army subsequent to completion of this analysis. The Final EIS would be used as a basis for future tiered analyses to support the adoption and implementation of an RPMP at YPG.

1.3 Scope and Content of the Programmatic Environmental Impact Statement

The U.S. Army has determined that carrying out the mission of YPG, as it evolves to meet the demands of new technologies and emerging in-theater needs, and implementation of construction projects proposed, has the potential to result in significant environmental impacts. Consequently, the U.S. Army has prepared this FPEIS to assess the impacts of those actions. This section presents the scope of the FPEIS, including the general approach to the evaluation of alternatives for implementing the Proposed Action.

YPG uses areas outside its boundaries to conduct specific military testing under conditions not found on YPG. These off-post locations used to conduct mission-related activities include:

- Senator Wash Reservoir (Imperial County, California [CA])
- Blaisdell Railroad Siding (Yuma County, Arizona [AZ])
- Marine Corps Air Station (MCAS) Yuma (Yuma County, AZ)
- Imperial Sand Dunes (Imperial County, CA)
- Death Valley (Inyo County, CA)
- Oatman Hill (Mohave County, AZ)
- Camp Navajo (Coconino County, AZ)
- Prescott Airport (Yavapai County, AZ)

Off-post locations are not addressed in this FPEIS since no changes are proposed for use of offsite areas. Impacts of off-post testing and training were evaluated in the Range Wide EIS (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001) and are confined to the specific test areas. Because off-post locations do not provide the same ecoclimatic conditions as YPG, these locations are not suitable for the testing and training proposed for YPG. As a result, the off-post areas used by the U.S. Army in conjunction with YPG are not included in the development of alternatives for this FPEIS.

The YPG mission continues to evolve and cannot be frozen while this EIS is prepared. YPG is considering the potential development of a solar renewable energy resource on the installation to increase YPG's energy security and meet federal mandates and legislative requirements to increase production and consumption of renewable energy resources. This development would be through an enhanced use lease (EUL) with a private company. Solar technologies under consideration by the Army include solar photovoltaic (PV), a dish-engine system based on the Stirling thermodynamic cycle (Dish Stirling), and dry-cooled concentrating solar thermal technologies. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined and the sites under consideration range from several hundred acres to several thousand acres (Black and Veatch Corporation [B&V], 2011; U.S. Army Environmental Command [USAEC], 2012). An EUL for solar power generation is not a component of the Proposed Action and a separate, specific NEPA analysis would be conducted for any such project that would be developed. The potential for cumulative impacts from development and operation of such a facility was considered in the assessment of potential cumulative impacts in this analysis, based on what was known at the time this document was prepared. Should design specifications become better defined prior to the decision on this action being made and if those design changes would result in changes to the analysis of cumulative impacts provided herein, this document will be revised prior to the decision document being signed.

The Quartzsite Solar Energy Project is proposed approximately 10 miles north of Quartzsite, Arizona in La Paz County. This project, which is scheduled to be in operation in 2015, would construct, operate, maintain, and decommission a 100-megawatt (MW) solar thermal generation power plant using dry-cooling technology with a 1.5-mile generator tie-line, switchyard, and access road. An EIS was prepared and a Record of Decision (ROD) for this project was signed in May 2013 (U.S. Department of Energy and Bureau of Land Management [BLM], 2013). This solar energy project is not a component of the Proposed Action, but the potential for cumulative impacts from development of this project was considered in the assessment of potential cumulative impacts in this analysis.

There are five proposed or recently operational solar projects within approximately 10 miles of YPG that would be implemented on BLM lands. The Paloma project and the Aqua-Caliente solar project are adjacent projects that have been recently constructed and are operational to the east of YPG. The LaPosa Solar Terminal is proposed as a 2,000-MW concentrated solar power trough that would be along U.S. Highway 95 (US 95) between the Cibola Region and the Kofa National Wildlife Refuge (NWR) in the vicinity of Stone Cabin. The Nextlight Quartzsite project would be a 500-MW concentrated solar power trough located south of Quartzsite. The Wildcat Quartzsite project is proposed as an 800-MW concentrated solar power tower facility that would be along US 95 between the Cibola Region and the Kofa NWR. These solar projects are not components of the Proposed Action, but the potential for cumulative impacts from development of these projects was considered in the assessment of potential cumulative impacts in this analysis.

1.3.1 Approach to Proposed Action Description

This document identifies which Proposed Action activities were analyzed in detail and which were analyzed programmatically. The analysis evaluates projects proposed for the foreseeable future. It is likely that not all evaluated activities would be implemented and the

decision could indicate that only a portion of the activities analyzed will be selected. The alternatives for specific activities considered include testing, training, and construction/demolition options to implement the Proposed Action.

This FPEIS also evaluates a No Action Alternative as required under CEQ regulations and NEPA.

1.3.2 Approach to Environmental Analysis

This subsection summarizes the approach applied in this FPEIS for identifying the resources that could be affected by the Army's Proposed Action.

This FPEIS considers relevant resource areas in the context of valued environmental components (VECs), which are the resources and human communities of concern that could be affected by the Proposed Action. Initially, YPG considered the following comprehensive list of VECs (sorted alphabetically):

- Air Quality
- Airspace Management
- Cultural Resources
- Energy/Utilities
- Environmental Justice
- Fire Management
- Geological Resources
- Hazardous Materials/Hazardous Waste
- Land Use
- Noise
- Recreation
- Safety
- Socioeconomics
- Soils
- Threatened or Endangered Species and Species of Concern
- Traffic/Transportation Systems
- Vegetation
- Visual Resources
- Water Resources (Surface Water and Groundwater, including wetlands)
- Wildlife and Fisheries

The VECs were screened and ranked based on their relative potential to be affected by the Proposed Action. An assessment of potential cumulative effects to VECs from implementation of the alternatives also is included. The results of this analysis are presented in the next section.

1.3.3 Categories and Relative Ranking of Valued Environmental Components

Following the public scoping process (Section 1.5), the Army developed and applied a deliberative process to rank the VECs according to their potential to be affected by the Proposed Action. This approach concentrates the environmental analysis on VECs that could be significantly affected by the Proposed Action (primary VECs) and also provides consideration of other less affected (or not affected) VECs at an appropriate level of detail, in compliance with CEQ and Army guidance. The categories of VECs and the associated level

of analysis necessary are based on the potential for impacts to occur. For this FPEIS, VECs are grouped into primary, secondary, and low potential for impact categories based on the significance of impacts that may be expected to occur (see Section 3). These VECs are grouped as follows:

- Primary VECs (high potential for impacts):
 - Cultural Resources
 - Energy/Utilities
 - Hazardous Materials/Hazardous Waste
 - Land Use
 - Noise
 - Safety
 - Soils
 - Threatened or Endangered Species and Species of Concern
 - Vegetation
 - Visual Resources
 - Wildlife and Fisheries
- Secondary VECs (moderate potential for impacts):
 - Air Quality
 - Recreation
 - Socioeconomics
 - Water Resources
- Low VECs (low to very low potential for impacts):
 - Airspace Management
 - Environmental Justice
 - Fire Management
 - Geological Resources
 - Traffic/Transportation

Primary and secondary VECs, those considered to have moderate to high potential for impacts, are subjected to detailed impact assessment, while the VECs considered to have low to very low potential for impacts were considered but not analyzed in detail. Section 3 presents the existing conditions and impacts analysis for each VEC with regard to direct, indirect, and cumulative impacts.

1.4 Decision to Be Made

The decision to be made is whether to adopt the list of projects, as presented, to adopt a subset of the proposed activities, or to take no action and continue operations on YPG at current testing and training levels using existing infrastructure.

1.5 Public Participation

Consideration of the comments of all interested persons promotes open communication and enables better decision-making. All agencies, tribal entities, organizations, and members of the public with a potential interest in the Proposed Action, including minority, low-income,

disadvantaged, and tribal groups, were provided the opportunity to participate in the decision-making process.

The scoping process officially began with the publication of a Notice of Intent (NOI) to prepare an EIS in the Federal Register on May 25, 2011. Two public scoping meetings were held following publication of the NOI. The NOI and the announcement of the public scoping meetings are provided in Appendix A. Open house public scoping meetings were conducted on Tuesday, June 14, 2011 from 5:00 PM to 7:00 PM at the Building 6, the Desert Breeze Travel Camp Community Center, and on Wednesday, June 15, 2011 from 5:00 PM to 7:00 PM at the Yuma Library located at 2951 South 21st Drive, Yuma, AZ 85364. All interested parties were invited to attend the public meetings and to submit comments throughout the NEPA process. Public scoping comments were solicited through June 30, 2011, which was 15 days following the last scoping meeting and 35 days following publication of the NOI.

YPG has been engaging and consulting with federally recognized Native American tribes regarding the PEIS. An initial tribal meeting was held in June 2011, with additional tribal meetings occurring in August 2012 and April 2013.

A Notice of Availability was published in the Federal Register on August 16, 2013, announcing the availability of the draft FPEIS for review and comment. The document was initially to be available for review for 45 days by agencies, governments, and the public. Due to the shutdown of the U.S. Government, an additional 20 days were added to the agency review period. A government and agency meeting was held at YPG on the afternoon of September 24, 2013. Public meetings were held at YPG on the evening of September 24, 2013, and at the Yuma Public Library Main Branch on the evening of September 25, 2013. Persons, agencies, or governments could comment at the meetings or could submit comments or questions by mail or e-mail to Sergio Obregon, National Environmental Policy Act Coordinator, U.S. Army Garrison YPG, IMWE-YMA-PWE, 301 C Street, Yuma, Arizona 85365-9498, ypgnepa@conus.army.mil. Comments received from the public, government agencies, and tribal organizations and the Army responses to these comments are provided in Section 8. Comments received were considered before the decision regarding implementing the Proposed Action on YPG was made. The public will be invited to review and comment on the FPEIS.

SECTION 2

Description of Proposed Action and Alternatives

This section provides a description of YPG and presents the alternatives considered in this FPEIS. The No Action Alternative is described first to identify clearly the existing activities conducted under the ongoing mission that would continue absent implementation of any action alternative. The Proposed Action includes the activities identified under the No Action Alternative, as well new construction, testing, and training proposed for implementation. After the description of the Proposed Action, there is a description of additional action alternatives that were considered.

2.1 Yuma Proving Ground

2.1.1 Functional Units

YPG is a U-shaped Army facility located in southwestern Arizona (Figure 2-1). The land between the arms of the “U” is managed by the U.S. Fish and Wildlife Service (USFWS) as the Kofa NWR. YPG is subdivided into five functional units, with each unit performing a different function in relation to the mission:

- Laguna Region
- Cibola Region
- Kofa Region, including Kofa Firing Range (KFR) and East Arm
- Airspace
- Off-post Locations

Laguna, Cibola, and Kofa Regions are shown on Figure 2-2. The Range Wide EIS (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001) and the Yuma Proving Ground Environmental Assessment (Mittlehauser Corporation, 1994) provide descriptions of YPG operations and that information is summarized in the following sections.

Throughout the YPG Ranges, there are numerous fixed sites that are used for a variety of purposes. Some were originally designed to support radar or optical instrumentation, camera sites, pads for equipment emplacement, landing pads, observation posts for visual observers, firing points, and impact areas. There are 523 established gun positions (GPs) on YPG (see Appendix B, Attachment 1), including improved and unimproved GPs. These sites also are used, as needed, to support UAS testing, to include temporary installation and employment of UAS launch/recovery systems, ground control station (GCSs), command and control infrastructure, and refueling operations. UAS testing may include optical tracking (ground or aerial), laser rangefinder, and laser designator operations. Tests are conducted at these areas on ground- or tower-mounted sensors, balloon- or aerostat (blimp)-mounted sensors, electro-optical sensors, infrared sensors, radar sensors, and unattended ground sensors, as well as wireless communications. These areas are also used for establishment of temporary firing positions to conduct ground weapons firing into approved impact areas or into catchboxes. Such temporary firing positions may be used to

fire small arms, shoulder-fired arms, guided munitions, artillery and mortars, rockets, rocket-propelled grenades (RPGs), AT-4 light antitank weapons (LAWs), and other direct fire weapons.

2.1.1.1 Laguna Region

The Laguna Region includes the three main cantonment areas within YPG: the Main Administrative Area (MAA), Yuma Test Center (YTC), and the Kofa cantonment. The cantonments within the Laguna Region are generally level, interspersed with low hills and washes. Mobility courses, which are tracks to test performance and reliability of automotive components, are located in more mountainous areas within the Laguna Region. The Laguna Region is bordered on the west and south by BLM and privately owned lands. Laguna covers approximately 68,720 acres (ac) and includes the MAA, the Yuma Test Area, Laguna Army Airfield (LAAF), Castle Dome Heliport (CDH), and the Air Cargo Complex. The eastern edge of Laguna is Firing Front Road, which abuts the Kofa Firing Front. Most of the existing mobility courses are in the Laguna Region.

2.1.1.2 Cibola Region

The Cibola Region encompasses approximately 438,195 ac and is the largest functional unit on YPG. The Cibola Region is mostly west of US 95. The boundaries include the western border of YPG and the inner eastern border (the eastern boundary of the western arm of the “U”) adjacent to BLM and privately owned lands. This terrain comprises large plains surrounded by mountainous areas. The Cibola Region is primarily used by the Air Combat Systems Directorate for the following:

- Air cargo delivery testing
- Precision guided and non-precision guided personnel parachute systems testing
- Precision guided and non-precision guided cargo parachute systems testing
- Airdrop certification of equipment and ammunition
- Certification of aircraft for airdrop operations
- External transportability testing
- General Soldier systems testing
- UAS testing
- Moored aerostat testing
- Sensor systems and laser testing
- Aircraft armament and weapons testing
- Counter-improvised explosive device (IED) technology testing
- Electronic warfare (EW) systems testing
- Training activities

The Cibola Region also supports the Military Freefall School (MFFS) parachute training courses, the Special Operations Terminal Attack Controller Course (SOTACC), various activities conducted by the Training Exercise Management Office (TEMO), and a variety of testing for the Ground Combat Directorate, including guided and unguided long-range artillery and mortar testing and tactical vehicle testing.

Isolated mountainous areas are used for air-to-ground testing and training. There are 32 munitions impact areas in the Cibola Region, which occupy approximately 33,000 ac (approximately 7.5 percent of the area). Prospect Square is the largest munitions impact area in the Cibola Region (approximately 22,250 ac), and the others range in size from less than 1

ac to approximately 3,750 ac. All munitions impact areas in the Cibola Region are capable of receiving explosive rounds. Portions of the Cibola Region are used extensively by non-military components, including industrial/private partnerships, military contractors, and the U.S. Department of Homeland Security. The U.S. Department of Homeland Security aerostat is a tethered UAS mounted with sensors to provide surveillance to detect low-altitude aircraft crossing the border.

2.1.1.3 Kofa Region

The Kofa Region is the largest instrumented firing range in the United States, encompassing approximately 331,259 ac, and includes the Kofa Region Administrative Area and Ammunition Storage Area. These lands primarily consist of a flat basin surrounded by mountains, providing ideal conditions for testing, training, and evaluating direct and indirect fire weapon systems and their associated ammunition. The Kofa Region also supports the testing and evaluation of various types of sensor systems, including, but not limited to, sensor systems mounted on towers or on the ground, on moored aerostats, and on vehicles, aircraft, or UAS. Types of systems can include electro-optical, infrared, radar, acoustic, and unattended ground sensors, as well as wireless communication. Kofa also supports UAS and manned aviation flight test, both in support of Kofa munitions firing programs and for developmental test and evaluation of UAS and aviation systems (Franklin, 2013a, personal communication). The East Arm of YPG is in the Kofa Region. The eastern and southern outer boundaries of the Kofa Region border BLM, State, and privately owned lands. The Kofa Firing Front is immediately east of Firing Front Road and forms the western boundary of the Kofa Region; it contains GPs that fire onto KFR. A Nuclear Regulatory Commission (NRC)-licensed depleted uranium (DU) firing area is located within KFR, along with other munitions impact areas. There are 23 munitions impact areas in the Kofa Region, which occupy approximately 110,000 ac (approximately 33 percent of the area). There are 23 munitions impact fields located within munitions impact areas Alpha, Bravo, Delta, Echo, Foxtrot, Ramsdell, and East. Delta and Echo, each approximately 32,000 ac, are the largest munitions impact areas in the Kofa Region and the others range in size from less than 1 ac to approximately 17,000 ac. Two Kofa Region munitions impact areas, Red Bluff and the Combat Systems Test Complex Direct Firing Range, are for inert fire only. The others are capable of receiving explosive rounds.

2.1.1.4 Airspace

YPG has restricted military airspace over most of YPG and over most of the Kofa NWR (Figure 2-3). Restricted airspace places priority on military operations, but can be used by private or commercial flights during periods of non-use by YPG or other military users provided proper clearance is obtained in advance. YPG allows use of its airspace by other military services for training activities when not in use by the installation.

2.1.1.5 Off-Post Locations

YPG uses areas outside its boundaries to conduct or support a variety of military testing and training missions under conditions not found on YPG. Activities conducted at off-post locations are independent of testing and training activities on YPG. Off-post locations used to conduct mission-related activities were identified in Section 1.3. Camp Navajo is used for testing automotive and combat systems at 7,000-foot (ft) elevation. The Prescott Airport is used for similar tests at 5,000-ft elevation. Senator Wash Reservoir was under an agreement with the U.S. Bureau of Reclamation to test and evaluate amphibious vehicles and also as a drop zone (DZ) for training and evaluating personnel in airdrop skills and procedures. The

Blaisdell Railroad Siding area (BLM right-of-way 30293) is used for railroad shipping and receiving and to evaluate equipment loads under various railway transport conditions. Imperial Sand Dunes is part of the California Desert Conservation Area managed by the BLM and is occasionally used to conduct vehicle and equipment testing projects and some troop training activities. Death Valley is used periodically for automotive testing because of features such as extended mountain grades and high temperatures. Oatman Hill is used under a special permit to conduct performance tests on trucks exceeding the maximum size and weight limits for public roads. YPG has a Memorandum of Agreement (MOA) with MCAS Yuma to test counter-battery radar systems by placing them in the vicinity of commercial and military air traffic on MCAS Yuma and the surrounding area.

The command at YPG also oversees two test centers located outside of the southwestern U.S. These off-post locations are not addressed in this FPEIS. No changes are proposed for use of offsite areas. The Cold Regions Test Center is located in Alaska and the Tropic Region Test Center is located in Panama and several other countries. These centers are used to conduct tests under cold weather and tropical conditions.

2.1.2 Military Mission and Support Directorates

YPG supports both military and non-military testing and training, as well as foreign militaries. Activities are conducted by a variety of organizations, as discussed below.

Munitions and Weapons Division—tests and evaluates military weapons, detection and neutralization equipment, ammunition, and related systems and equipment throughout the item's lifecycle from concept demonstrations, to development, type classification operational evaluations, production acceptance, product improvements, and malfunction investigations. Munitions and Weapons Division directs the planning and execution of tests for:

- Mortar weapons, mortar ammunition, mortar systems and components
- Artillery weapons, artillery ammunition, artillery systems and components
- Mines, mine components, and mine clearing systems
- Tank weapons, munitions, associated ordnance material
- Weapons-related general combat equipment
- Counter-mine systems and components
- Demolition materiel
- Counter-fire systems and components
- Counter-fire sensors
- Radars

Munitions and Weapons Division also tests other materials under development and under a product improvement initiative. This division also conducts acceptance testing of the items listed above, which involves sampling each lot. The samples are tested to ensure they meet government performance, reliability, and safety standards.

Aviation Systems and Electronic Test (ASET) Division—conducts most airborne activities and some ground-related activities. ASET Division is the primary location for Army developmental air transport and airdrop tests, which focus on development of new or improved methods for transport and delivery of personnel, equipment, and munitions. This division develops, tests, and analyzes parachute systems, aerial retardation systems, aircraft systems, aircraft airdrop systems, aircraft escape systems, internal and external air transportability of equipment and materials, descending and retrieval systems, vertically

controlled impacts, and the effects of the desert environment on aviation and airdrop material. ASET Division also tests aircraft armament systems, aircraft weapons and fire control systems, precision navigation systems, airborne and ground target acquisition systems, ground and aerial rockets and rocket systems, general support equipment, Soldier equipment, and chemical-biological defense equipment. UAS operations testing includes UAS launch/recovery, command and control, as well as administration of UAS tests. Additionally, ASET Division conducts sensor testing of systems mounted to towers or on the ground, on moored aerostats, and on vehicles, aircraft, or UAS. Types of systems can include electro-optical, infrared, radar, acoustic, and unattended ground sensors, and wireless communication.

Testing of EW is conducted by the ASET Electronic Warfare Branch and involves but is not limited to, Counter-Radio Controlled IED (RCIED) Electronic Warfare (CREW) jamming systems, several systems designed to detect threats prior to detonation, and systems to identify, locate, and track enemy personnel for emplacing the threats. Testing includes performance, interoperability, and communications for potential, pending, and currently fielded counter-IED and counter-terrorism technologies, as well as EW systems.

Combat and Automotive Systems Division—tests and evaluates tracked and wheeled vehicles, weapons systems, including tank weapons and other vehicle-mounted weapons and ammunition, other mobile equipment, fuel and water transfer systems, unmanned/robotic systems for both government and private industry, as well as human factors in combat scenarios. Testing involves vehicle systems performance and reliability under desert conditions. The division also assists private industry by providing services and use of test facilities. The division also provides Human Factors Engineering support to other test areas. Vehicle testing is governed by *Standard Operating Procedure (SOP) for Conducting Automotive Testing* (YP-YTC-P-5001) and weapons testing is governed by *SOP for Conducting Combat Vehicle Weapons Systems and Ammunition* (YP-YTC-P-5100). These SOPs are updated as necessary to reflect vehicle, technology, and testing changes.

Persistent Surveillance Systems (PSS)—conducted by the ASET Sensors Branch to test and evaluate computers, combat systems, intelligence, surveillance, and reconnaissance (C5ISR) systems on aerostat platforms moored as high as 15,000 ft above the ground. Testing includes the use of various military and civilian vehicles and simulated insurgents with live fire from firearms, small artillery, and explosives.

Unmanned Aircraft Systems (UAS)—testing of UAS conducted by the ASET Aviation Systems Branch and involves all aspects of UAS, including sensors, communications, weapons firing, and aircraft operation on UAS platforms ranging from 1 pound (lb) to more than 15,000 lb. Testing occurs during all stages of the development cycle and includes test firing of weapons systems.

Training Exercise Management Office (TEMO)—responsible for visiting unit coordination and management of training activities on YPG. TEMO also conducts training activities and provides support services to its test divisions and supported components. YPG is used for a variety of training objectives by the Army as well as the U.S. Marines, U.S. Air Force, and U.S. Army Reserve units. Training activities include:

- Physical fitness and endurance events
- Live fire of assigned weapons systems (small arms to large caliber)
- Dismounted maneuvers

- Bivouac
- Forward operations base and logistics support site training
- Airfield operations
- Military operations in urban terrain
- Demolition training
- Counter-mobility training
- Military theater of operation construction
- Land navigation
- Aircraft and vehicle gunnery
- Vehicle fording operations
- Night maneuvers training
- Driver/convoy training
- Air to ground aircraft gunnery
- Unmanned aerial vehicle (UAV)/UAS training
- Aerostat training
- Land navigation
- Airmobile tactical training
- Military working dog (MWD) training
- MFFS
- Periodic Golden Knights parachute training
- Visiting units training
- Non-military law enforcement units

Training activities prepare units for the terrain and unique physical characteristics of the desert environment. Some training activities on YPG are combined with testing to determine the performance of weapons and equipment under field conditions rather than test conditions. This operational testing is conducted to support other testing activities, such as when live fire is needed to provide appropriate test conditions. Field exercise training may include mounted or dismounted maneuvers, live-fire activities, and bivouacs for extended activities. Training occurs in designated areas in all three regions of YPG.

MWD courses address all aspects of combat application and pre-deployment preparation of MWD teams. Training involves all U.S. services, and allied forces' MWD teams also may participate. Training events vary in duration and troop count. MWD training courses at YPG typically last for 2 to 4 weeks, but advanced training may have an extended duration of 9 months. The number of military personnel participating in training events varies from as few as 6 up to 30. Most MWD teams are composed of one handler and one MWD, but on occasion, a handler may have two MWDs. Additional personnel, who are not MWD handlers, also participate in training courses.

Visiting unit training occurs throughout YPG and may be conducted at any time during the year, but with no established times. YPG provides facilities and ranges to fill training gaps that cannot be met at a unit's home station due to capability limitations or a lack of availability during the required dates. YPG also provides opportunities to maximize efficiency by offering training while a unit is in southwest Arizona in support of other initiatives or exercises. Durations of visiting unit training events range from a single day up to approximately 2 weeks. The number of personnel varies among units, ranging from

about 20 to as many as 300. Visiting unit training may include the types of training identified above.

The Weapons Tactics Instructors (WTI) course is a biannual exercise that is scheduled during spring and fall. This course is a capstone U.S. Marine Corps exercise that involves all available assets to support the U.S. Marine Corps Air-Ground campaign (fighter aircraft, reconnaissance aircraft, command and control aircraft, air tankers, tilt rotor aircraft, helicopters, and UAVs). This aviation-centric exercise is supported by combined ground combat, combat support, and service support forces from the U.S. Marine Corps, the Army, U.S. Air Force, and allied forces. The exercise is centered on MCAS Yuma, hosting approximately 350 aircraft and 5,000 military personnel during each 6-week WTI exercise. YPG provides support for WTI exercises. The primary ground combat force, a USMC Infantry battalion, quarters at the YPG FOB Site at LAAF and conducts multi-echelon training on YPG that includes live fire with all organic weapons systems. UAV units may operate from YPG UAS sites. LAAF supports air traffic control, aircraft refueling and rearming, and airfield air and ground defense units and operations. Culminating exercises amass collective capabilities built throughout the exercises for simulated airmobile assaults involving all components of the air-ground campaign that may include activities on YPG.

Federal, state, county, and city law enforcement agencies use YPG ranges and training areas to support their training and qualification requirements. Law enforcement training includes live fire and non-live fire scenarios. Group size varies from 12 to 50 participants. Law enforcement training exercises last between 1 day and 3 weeks, depending on the type of training, and occur on average once every other month.

Military Freefall School (MFFS)—The MFFS, part of the U.S. Army John F. Kennedy Special Warfare Center and School, is a joint forces training school covering all aspects of military freefall parachuting. Students are taught to use high altitude-low opening and high altitude-high opening parachuting techniques. Training includes platform, hands-on, and actual parachute operations. Students come from all military services and typically originate in elite organizations within their service. The MFFS trains selected special-operations forces, other DoD forces, and foreign personnel. The MFFS typically uses DZs in the Cibola Region for training activities, although other YPG airspace may be used. In addition, to approach DZs, aircraft used by MFFS may fly over the Imperial NWR.

Military-support Contractors—military contractors allowed to use YPG to test new technologies or equipment being developed for one or more branches of the military under desert conditions. Military-support Contractors have identified future needs on YPG, and these activities are included in the Proposed Action.

Private Partnerships/Industrial Operations—non-military components allowed to develop and use facilities on the installation. Private partnerships must comply with all Federal, State, and Army regulations and requirements. No new private partnership actions are proposed and such actions are not evaluated in this FPEIS. Future private partnership projects will be assessed on a project and site-specific basis. Private project proponents will be responsible for implementing NEPA, if required, and any mitigation of impacts required as a result of site-specific analysis. Some industries may use existing military facilities.

The activities currently conducted by the four test divisions, TEMO, and military-support contractors are described in Section 2.1.2 and Appendix B. There are no proposed changes in activities conducted by industrial operations and these entities are not further considered.

In addition to these supported components, YPG also allows use of portions of the installation by the Boy Scouts of America (BSA) and by Drug Abuse Resistance Education (D.A.R.E.) for camps and group activities.

Support organizations provide all structures and facilities for mission, logistical, and personnel support. Mission and logistical support encompasses communication networks, data control, ammunition storage, physical security, meteorology, vehicle maintenance, safety, environmental support, and fabrication facilities. Personnel and general support includes housing, food services, recreation, administrative and medical services, and facility maintenance.

2.2 Approach to Alternative Development

The No Action Alternative is described in Section 2.3, as supported by Appendix B. The Proposed Action is described in Section 2.4.

Potential alternatives for specific proposed projects included in the Proposed Action subjected to detailed analysis in this document are provided in Section 2.5. This section identifies those proposed activities where reasonable alternatives exist and provides a description of alternatives considered. Proposed projects for which no feasible alternatives exist also are identified and the justification for not considering other alternatives is provided. It also is possible that the decision-maker would select a subset of the activities included within the Proposed Action and other activities from Section 2.5.

For proposed projects subjected to programmatic analysis, no alternatives were considered. Rather, to the extent practical the maximum potential impacts of the project activities were analyzed on a broad scale. These activities would be subjected to site-specific NEPA analysis prior to implementation that could include analysis of other reasonable alternatives to the identified action.

The U.S. Army considered of input from government agencies and tribal organizations and input from Support Directorates to identify a Preferred Alternative. The Preferred Alternative selected reduced areas for two proposed activities (K003 and K026) to avoid or minimize potential impacts to an identified resource. Similarly, the Preferred Alternative selects the smaller of considered alternatives for two activities (L030-a, C034-a) to minimize the potential for impacts to resources. Where there was no meaningful difference in the potential impacts of activities with multiple alternatives, The Preferred Action selected the alternative that aligned best with mission requirements.

Alternatives to the Proposed Action that were considered but eliminated from further consideration are described in Section 2.7.

2.3 No Action Alternative

2.3.1 Description of the No Action Alternative

The No Action Alternative is the continuation of existing operations on YPG. Under the No Action Alternative, testing and training would continue at the current levels and utilize existing facilities and infrastructure with no new construction. Ongoing testing and training occur in specific areas within YPG, and the locations of current activities are depicted on Figures 2-4 through 2-12. Tables identifying the testing and training activities included under

the No Action Alternative are provided in Appendix B, as Tables B-1 through B-3, which are separated according to the three regions (Laguna, Cibola, and Kofa Regions). No test areas, munitions impact areas, or DZs would be expanded under the No Action Alternative. No construction or demolition would occur.

2.3.2 Previous Analyses of the Activities in the No Action Alternative

The testing and training activities of the No Action Alternative have been evaluated previously through multiple NEPA documents:

- Environmental Assessment, Yuma Proving Ground United States Army. U.S. Army Corps of Engineers and Michael Brandman Associates, Inc., revised by Mittlehauser Corporation. Original Document 1987, revised 1994. (Mittlehauser Corporation, 1994)
- Environmental Assessment for the Combat Systems Test Complex, May 30, 2000. Command Technology Directorate CSTE-DTC-YP-CD. Jason Associates Corporation. May 2000. (Jason Associates Corporation, 2000)
- Final Range Wide Environmental Impact Statement, U.S. Army Yuma Proving Ground, Yuma and La Paz Counties, Arizona. Command Technology Directorate CSTE-DTC-YP-CD-ES; Gutierrez-Palmenberg, Inc. and Jason Associates Corporation. July 2001. (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001)
- Environmental Assessment for Mohave Drop Zone. Prepared for U.S. Army Proving Ground Command Technology Directorate. September, 2001. (Jason Associates Corporation, 2001)
- Environmental Assessment for the Joint Experimental Range Complex. U.S. Army Garrison Yuma, Environmental Sciences Directorate. March 2, 2004. (YPG, 2004)
- Environmental Assessment for the Joint Experimentation Range Complex II. U.S. Army Garrison Yuma, Environmental Sciences Directorate. August 2006. (YPG, 2006)
- Environmental Assessment for the Joint Experimentation Range Complex (JERC) III, Operational Road Course and Service/ Access Road. Jason Associates Corporation. December 2007. (Jason Associates Corporation, 2007)
- Final Environmental Assessment for the Unmanned Aircraft Systems Test Center. Jason Associates Corporation. January 2008. (Jason Associates Corporation, 2008a)
- Final Environmental Assessment for the Proposed Cobra Flats, Comanche Flats, and Site 2 Military Training Areas. Jason Associates Corporation. January 2008. (Jason Associates Corporation, 2008b)
- Final Environmental Assessment for the Army Test Tracks. Prepared for U.S. Army Garrison Yuma Proving Ground. Jason Associates Corporation. March 2008 (Jason Associates Corporation, 2008c)
- Environmental Assessment for Improvised Explosive Devices (IED) Test Environment. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground (YPG Directorate of Public Works [DPW]). January 2010. (YPG DPW, 2010a)

- Environmental Assessment for Impact Areas Expansion. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. March 2010. (YPG DPW, 2010b)
- Environmental Assessment for Cibola Impact Areas. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. April 2011. (Gutierrez Canales Engineering, P.C., 2011)
- Environmental Assessment for Fuel Facilities Optimization. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. November 2011. (YPG DPW, 2011a)
- Environmental Assessment for Persistent Surveillance Systems Program. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. December 2011. (YPG DPW, 2011b)
- Environmental Assessment for Long Range Munitions. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. April 2013. (YPG DPW, 2013a)
- Environmental Assessment for Military Training Area Expansion, Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. May 2013. (YPG DPW, 2013b)

The evaluations and analyses presented in these previous NEPA documents provide the baseline for comparison of potential impacts considered in this FPEIS. The descriptions and analyses presented in the NEPA documents listed above are incorporated into this FPEIS by reference.

2.3.3 Existing Activities

The following sections describe the types of activities conducted by the various testing and training entities on YPG. Common to all testing and training is the use of electromagnetic (EM) radiation, including communication systems and lasers, as system components for communication, range finding, target acquisition, and other purposes. An EM gun is tested at the EM GP in the Kofa Region.

Sources of EM radiation are used and tested on YPG for a wide number of tasks. EM radiation may be used from both ground and aviation platforms. EM radiation systems operate at all frequencies and at a variety of power levels ranging from microwatts to megawatts.

Lasers of all classes are used and tested on YPG, primarily for target acquisition, training, fire control, and directed energy applications. Lasing may be used from ground or aviation platforms and may terminate on either ground or air targets.

There would be continued use of lasers and EM radiation under the No Action Alternative.

Throughout the YPG Ranges, there are numerous fixed sites that are used for a variety of purposes. Some were originally designed to support radar or optical instrumentation, camera sites, pads for equipment emplacement, landing pads, observation posts for visual observers, firing points, GPs, and impact areas. All of these sites also are used, as needed, to support UAS testing, to include temporary installation and employment of UAS launch/recovery systems, GCSs, command and control infrastructure, and refueling

operations. UAS testing may include optical tracking (ground or aerial), laser rangefinder, and laser designator operations. Tests are conducted at these areas on ground- or tower-mounted sensors, balloon- or aerostat-mounted sensors, electro-optical sensors, infrared sensors, radar sensors, and unattended ground sensors, as well as wireless communications. These areas are also used for establishment of temporary firing positions to conduct ground weapons firing into approved impact areas, including small arms, shoulder-fired arms, guided munitions, artillery and mortars, rockets, RPGs, AT-4 LAWs, and other direct fire weapons. YPG would continue to conduct these types of activities at these locations under the No Action Alternative.

YPG utilizes a mobile dust generator to simulate windblown dust for specific test requirements. Dust simulation may be used for equipment, munitions, sensor, vehicle, or other tests depending on specific testing requirements. This dust generator may be used in any established testing area on YPG, as required for specific tests. YPG will continue to use the dust generator under the No Action Alternative, as needed.

Within munitions impact areas, YPG routinely establishes temporary firing positions to meet specific testing needs. Temporary firing positions may be established anywhere within a designated munitions impact area. YPG will continue to use temporary firing positions, as needed to meet testing objectives, within designated munitions impact areas under the No Action Alternative.

2.3.3.1 Munitions and Weapons

These activities include the testing and evaluation of weapons, ammunition, explosive ordnance, and related items. The primary test site for these operations is KFR, with both conventional and specialized facilities and instrumentation sites. Electro Thermal/EM weapons tests are conducted in a dedicated facility in KFR.

YPG tests airborne weapons systems, combat vehicle weapons and related munitions, direct and indirect fire programs, vertical firings, illumination programs, and inert items. Munitions, weapons, mines, and other materiel tested on YPG include experimental tube artillery and gun systems and associated ammunition from 120 millimeter (mm) to 16-inch, mines, counter-mine systems, counter-fire systems, related ordnance material, related general equipment items designed for combat use, mortars, field artillery weapons, machine guns, and materiel. More than 10,000 rounds per year typically are fired for this testing. The primary test site for artillery and mortar weapons and munitions testing is KFR, which contains a 40-mile overland artillery range including fixed and temporary firing positions with conventional and specialized facilities and instrumentation. Most testing is from stationary guns at established GPs and firing points.

Over 400 established firing points are maintained on the KFR that are used for testing artillery, tank, and mortar direct and indirect fire capabilities. When in use, GPs include the weapon to be tested and supporting utilities and facilities. There are 13 fixed GPs that are fully improved sites with permanent structures, including blast shields, and electricity/telecommunications support. There also are seven semi-permanent GPs with permanent buildings that have electricity/telecommunications support. The remaining GPs are transient gun positions (TGP), which are multiple use areas that may be used for firing, sensor or camera placement, or for observation of testing activities. TGPs are cleared areas (up to a 175-ft radius area [2.2 ac]) that may have telecommunications support. Electrical service may be provided or generators may be used to supply electricity during tests.

Trailers and other support facilities or equipment are placed on the TGP for the duration of a test and then removed. Instrumentation at a TGP used to collect and analyze data from weapon systems and/or munitions during tests includes, but is not limited to, cameras, radars, microphones, lights, optical sensors, and pressure transducers. Other equipment that is typically brought in to support a firing test includes, but is not limited to: $\frac{3}{4}$ -ton pick-up trucks, 2 $\frac{1}{2}$ -ton flatbed truck, 5-ton cargo truck (tactical or commercial), grader, crane, low-boy trailer, all-terrain fork lift, front-end loader, backhoe, bulldozer, dump truck, instrumentation van, and bomb-proof blast shields.

YPG is licensed through the NRC to conduct firing programs involving munitions that contain DU. No additional use of DU materials would occur under the Proposed Action. The NRC-licensed DU impact area is in the northwestern part of the Kofa Region and is regularly monitored to confirm that no adverse environmental impacts occur. After firing, the impact areas are searched by Ammunition Recovery personnel to recover spent DU rounds. Collected spent DU rounds are stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. The NRC-licensed DU impact area has a DU Catchment Structure and spent DU rounds are collected by Ammunition Recovery personnel and stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. There is an evaporative lagoon (catchment basin) that collects runoff from the DU Catchment Structure to minimize the potential for stormwater transport of DU off-post or to other areas on-post.

Range instrumentation that supports testing includes, but is not limited to, fuze chronographs, burst height monitors, muzzle velocity radars, tracking radars, high-speed cameras, video monitors, Kineto tracking mounts, telemetry antennas, optical theodolites, wireless communication equipment, and versatile tracking mounts. Temperature conditioning boxes and environmental simulators, including rough handling, transportation vibration, drop towers, temperature/altitude, humidity, enveloping flame, and dust and salt fog chambers, are used to conduct munitions and weapons tests.

Support facilities in the Kofa Region prepare weapons and munitions that are tested, including assembly and storage of propellants, fuzes, and other sensitive explosives. Support facilities perform all maintenance for weapons assigned to YPG, including towed and self-propelled artillery and fire control systems. YPG also has dedicated mine and counter-mine facilities.

There are numerous radar sites throughout KFR that are primarily used to host and support deployment and operation of counter-battery radar systems and other sensors during testing. These sites are known as radar sites 1, 2, and 3, the Firefinder Compound, the Counter-fire Compound, and the Counter-Rocket Artillery and Mortar (CRAM) area (including Site 15, Tower 48, and the Land-Based Phalanx Weapon System [LPWS] GPs). These sites are established and improved areas with hard power, telecom infrastructure, vehicle parking areas, equipment storage containers, and personnel shelters that serve as the command center for test support personnel and test equipment during test operations. These sites are used to conduct tests involving geographically separated but networked sensors and weapon systems. These systems support testing by multiple testing groups and are not limited to munitions and weapons testing.

2.3.3.2 Air Delivery Systems and Air Movable Equipment

This work includes air cargo delivery, testing of precision guided and non-precision guided cargo and personnel parachute systems, airdrop certification of equipment and ammunition, certification of aircraft for airdrop operations, external transportability testing, and general Soldier systems testing. Testing is conducted using DZs and fixed facilities. Restricted airspace over the DZs is controlled by YPG. Testing consists of airdrops of personnel, equipment, and ammunition. Most airdrop testing and training is done during the day, with occasional night operations.

Airdrop operations use designated DZs for personnel drops and to test material and munitions transport reliability under parachute drop delivery. DZs also must be capable of supporting instrumentation to track dropped loads from the aircraft to the ground. Because cargo drops frequently are from high altitude airplanes, there is potential for loads to miss the target or even the DZ and the surrounding area must be capable of tolerating such errant drops. DZs also must be accessible to heavy equipment for retrieval of dropped loads. Unless designated for personnel only or otherwise restricted for specific uses, any DZ may be used to test any material or munitions. This may result in the need for detonation-in-place of unexploded rounds that cannot be safely removed following a test. Detonation-in-place is accomplished through the use of donor explosives by trained and authorized specialists who use the minimum amount of donor explosive required to safely accomplish the detonation. The use of detonation-in-place to remove hazards from DZs would continue under the No Action Alternative, as needed.

Static drop testing determines the capability of military materiel to withstand ground impact forces resulting from accidental drop during transport. A crane is used to lift and drop loads to provide specific impact velocities. Fit checks and roll-on/roll-off testing are done using a C-130 fuselage.

The building, assembly, and rigging of loads for testing and training are done at YPG facilities. Parachute fabrication and maintenance activities include fabrication, inspection, repair, and modification of parachute assemblies and components required to support test programs. Parachutes are packed on YPG at facilities under controlled conditions. A shake-out/drying tower is used for large cargo parachutes prior to packing. Other support activities include load preparation, aircraft loading, recovery of airdrop and air transported equipment, and installation of data acquisition instrumentation systems for airdrop tests.

2.3.3.3 Aircraft Armament Systems

This testing includes development and performance testing of aircraft armament components and systems. Emphasis is on internal and external armament and fire control systems on rotary wing aircraft (helicopters), although fixed wing aircraft also are used. Developmental testing of Army aircraft armament components includes air-to-ground and air-to-air testing in various designated munitions impact areas with an emphasis on rotary wing aircraft. Aircraft use designated field sites located throughout YPG to take off and land and for re-arming and refueling operations. All components of aircraft armament systems are tested, including turreted guns, rockets, countermeasures, dispensers and launchers, guided missiles, laser systems and rangefinders, fire control systems, night vision devices, and aircraft integrations. Aircraft armament testing directly involves tests conducted on aircraft, and also includes firing ground-to-ground from specially constructed mounts and fixtures. Ground-to-ground firing of aircraft armament components and systems uses some

of the same types of support facilities and instrumentation as artillery and combat vehicle weapons testing.

Testing of aircraft armament systems may include both ground and aerial firing. Munitions used may include small arms, ranging in sizes from 5.56mm to 203mm and consist of ball ammunition, incendiary, tracers, and other types of military rounds. They may also include ballistic rockets ranging in size from 57mm up to 240mm, guided missiles ranging in size from 70mm with warheads weighing less than 10 lb, to warheads weighing in excess of 60 lb. Specialized munitions such as flares, illumination, chaff, Tube-launched, Optically Tracked, Wire Command (TOW) missiles, AT-4 LAW, and all series of RPGs may also be fired or dispensed. Bombs (projectiles that require the acceleration due to gravity for propulsion) may be utilized for testing and could weigh up to 1,000 lb. Target, instrumentation, and range facilities are in designated areas that can accommodate the safety fan (the area established around the impact point with a probability of a round landing outside the safety fan being one in one-million) of weapons being tested. Both passive and active targeting systems are tested using sensors in a number of regions of the EM spectrum, including infrared (IR), ultra-violet (UV), and visible lasers, millimeter wave radar, and magnetic signature detectors. Tests for these systems may include large, real threat target arrays moving in tactical scenarios. Both ground and aerial targets are used.

Rangefinders, lasers, and radar systems are used for tracking and recording data, for sighting and alignment, and for testing tracking and guidance systems. Laser systems tested on YPG include ground-mounted, vehicle-mounted, and airborne systems. Laser systems may have eye-hazard distances of several miles and include both continuous wave and pulsed lasers with output energies ranging from microwatts to megawatts. Turreted lasers require test areas large enough to transmit in azimuth sweeps of 240 degrees or more. Testing of these laser systems and rangefinders in conjunction with armament systems requires ranges and restricted airspace capable of accommodating sweeps of 240 degrees and at least an 18-mile radius. YPG has ranges and restricted airspace to accommodate these tests.

2.3.3.4 C5ISR Systems

C5ISR systems are integrated intelligence networks designed to collect and share data from multiple sources across the battlefield. Typical C5ISR systems comprise transport systems (personnel, aircraft, vehicles, etc.), computers, software, communications (wireless and wired), networks (classified and unclassified), data (archive, dissemination, and exploitation), sensors (radar, electro-optical, infrared, laser, seismic, acoustic, biometrics, hyperspectral, signal detection, etc.), and sensor platforms (aerostats, airships, aircraft, vehicles, towers, etc.). The emphasis of C5ISR testing is on component level, system level, and “systems of systems” interoperability. C5ISR systems are used for Force Protection, ISR (intelligence, surveillance, and reconnaissance), RSTA (reconnaissance, surveillance, and target acquisition), and border security missions.

2.3.3.5 UAS

UASs include the GCS, UAV, launch/recovery systems, and other ancillary equipment. UAS testing includes rotary wing, fixed wing, high altitude long endurance, medium altitude long endurance, high speed jet, and transitional vertical take-off and landing airships. Testing addresses both ground-launched and air-launched systems. The size of

UAS aircraft tested varies from under 1 lb to 15,000 lb. Energy sources include batteries, solar cells, heavy fuel, aviation gasoline, and combination systems.

UASs typically are tested for persistent surveillance, ISR, RSTA, sling load, over the hill resupply, communications relay, cargo transport, battle damage assessment, manned-unmanned teaming, change detection, and shipboard and ground operations. UASs typically carry a variety of sensors, including laser systems, and may include weapons. UAS weapons testing is conducted at designated munitions impact areas.

2.3.3.6 Combat and Automotive Systems

This includes the testing and evaluation of wheeled and tracked vehicles, direct fire programs, combat vehicle weapons systems and related munitions, target acquisition systems, vehicle components, communication systems, and related items including fire control systems, fuels, lubricants, and other automotive chemical products. Munitions, weapons, and other materiel tested on YPG include tank gun systems and associated ammunition from 5.56mm to 120mm and small arms. The demand for automotive testing is projected to increase into the future as new generation military vehicles and commercial vehicles are developed. Multiple tests are conducted in parallel, many of which are within a competitive bid process with multiple vendors, with the potential for several vehicles operating on multiple performance test facilities while other combat vehicle weapons system firing tests are conducted. Typically, automotive testing involves several hundred vehicles per year that, in total, are driven in excess of 2.5 million miles to evaluate performance, maintainability, and reliability. Automotive-type equipment tested on YPG includes combat vehicle weapons systems, tactical, special and general purpose vehicles, construction equipment, industrial and power generation equipment, missile ground support and fuel/water distribution system equipment, robotic (autonomous/unmanned) systems, automotive components and materials, and military fuels and lubricants. Typical automotive performance tests include tractive effort, full-load cooling, road load cooling, fuel consumption, speed, acceleration, braking, handling, field of vision/fire, transportability, towing, ride quality, toxic fumes, and fording/swimming capability. Fording capability is tested at the fording basin in the Laguna Region. Environmental tests evaluate starting ability at extreme high and low temperatures, effects of rain and humidity, operation at high altitudes, vapor lock tendencies, and the ability of air cleaners and other subsystems to function in severe sand and dust conditions. Additionally, transportation of military vehicles by rail and air is addressed by YTC.

The performance of military personnel who operate and maintain test vehicles and equipment under field conditions also is within the mission of automotive testing. Testing may use fixed or moving targets and may be done from stationary or moving vehicles. YPG is the DoD center for tire testing and has established dedicated tire test courses.

Most vehicle test courses are within the YTC of the Laguna Region. Established vehicle test courses provide over 250 miles of courses that vary with respect to road, grade, and soil conditions. The valley, wash, and mountainous areas on YPG provide differing degrees of severity for endurance and reliability testing, as well as general desert environment testing. Firing facilities with moving targets, zigzag courses, bumps, and firing pads allow testing of weapons and fire control systems, which may be stationary or moving.

Automotive has a laboratory for analysis of carbon monoxide (CO), oxides of nitrogen (NO_x), ammonia, and sulfur dioxide (SO₂) that may be generated from aircraft and ground

vehicle weapon firings or engine operations in a stationary mode and can accumulate in cockpit/crew compartments. Non-routine analyses of other gases and fumes from weapon debris, explosives, and propellants also are conducted. Environmental chambers are used to expose vehicles and equipment to extreme temperatures and varying levels of humidity. Vehicle-mounted weapons up to 40mm can be fired from these chambers. Mobility absorption dynamometers support operations and are used for drawbar pull, fuel consumption, full-load cooling, and tractive resistance tests.

Automotive also conducts maintenance on all test vehicles as part of its mission. These activities are done in facilities in the Kofa cantonment in the eastern part of the Laguna Region. Buildings used for these activities are designed to contain any spills of petroleum, oils, and lubricants (POLs) that may occur during maintenance of test vehicles.

YPG is licensed through the NRC to conduct firing programs involving munitions that contain DU. No additional use of DU materials would occur under the Proposed Action. The NRC-licensed DU impact area is in the northwestern part of the Kofa Region and is regularly monitored to confirm that no adverse environmental impacts occur. After firing, the impact areas are searched by Ammunition Recovery personnel to recover spent DU rounds. Collected spent DU rounds are stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. The NRC-licensed DU impact area has a DU Catchment Structure and spent DU rounds are collected by Ammunition Recovery personnel and stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. There is an evaporative lagoon (catchment basin) that collects runoff from the DU Catchment Structure to minimize the potential for stormwater transport of DU off-post or to other areas on-post.

2.3.3.7 Counter-IED Activities

The EW Branch of the ASET Division tests counter-IED electronic systems primarily at the JERC sites in the northern Cibola Region, but also at other designated EW ranges on Cibola and Kofa. Counter-IED facilities include large complexes of buildings, roads, bridges and overpasses, and other infrastructure that replicate typical urban settings and overseas combat areas. The facilities include re-creation of the EM environment in those overseas areas. These facilities and the tests continually evolve to reflect changes in in-theater conditions. Counter-IED testing platforms include equipment varying in size from tiny sensors to tethered surveillance aerostats. Simulated IEDs include both inert and explosive devices and weapons.

EW test ranges support multiple test functions, including detection and defeat of IEDs, force protection, performance capabilities and limitations, theater support, interoperability/EM compatibility, Electromagnetic Counter Measure Device (ECMD) devices, blue force communications compatibility, platform integration, radio frequency safety measurements and system safety assessment test efforts, firing events, laser events, and blended test and training events. Blended test and training events include activities such as acceptance testing of the Mine Resistant Ambush Protected (MRAP) all-terrain vehicle.

EW ranges have an interconnected fiber communications system that extends throughout each EW range. These interconnected systems allow testing to occur in multiple locations simultaneously across test sites in support of a single test effort.

2.3.3.8 Training

YPG provides training and operational testing where military personnel use various weapons, munitions, vehicles, aircraft, and systems under tactical conditions and includes both vehicle-mounted training and dismounted training. In addition to the Army, other military units such as SOTACC, and visiting units also conduct training exercises on YPG. Visiting units include:

- Special Operations Command
- U.S. Marine Corps (includes support squads that train on water purification systems)
- U.S. Navy
- U.S. Air Force
- U.S. Customs and Border Protection (personnel and K-9 Units)
- U.S. Coast Guard
- U.S. Army Reserve
- Arizona National Guard
- Arizona Local Law Enforcement Agencies
- California Local Law Enforcement Agencies
- Other Federal and DoD Entities
- Foreign Nation Forces
- DoD Contractor Support

Training may include classroom or controlled environment exercises and field exercises. Additional operator training is conducted by DoD contractors.

Unless expressly designated for vehicle maneuvers, Light Maneuver Training Areas (LTAs) are for dismounted training with vehicle use restricted to existing improved roads and both maintained and unmaintained unimproved roads. Only incidental off-road vehicle operation related to troop/equipment drop-off or pick-up occurs. Training is conducted in designated areas in all three regions of YPG. In most areas, training is limited to company-level (approximately 120 military personnel) or smaller units. The Laguna Region Forward Operating Base (FOB) by LAAF, the Castle Dome FOB, and the Combat Systems Test Complex in the Kofa Region are capable of accommodating larger numbers of military personnel. Facilities, such as mock desert villages and simulated target areas, roadways, and trails provide military personnel with conditions similar to those encountered in the Middle East. Training activities in LTAs may include bivouacs, which would be located near roads to provide ease of access for military personnel and portable toilets. No digging or other ground intrusive activities occur during bivouacs and previously disturbed areas typically are selected. Trailer-mounted 60-kilowatt generators may be used during training. These are operated within secondary containment to prevent fuel spills and generators are operated only near roads due to access requirements.

The training mission also includes military working dog training, combat skills, paratrooper training, night training, air operations, troop/equipment movement, land navigation, logistics exercises, intelligence training, field repair training, establishment of bivouacs and base camps, communications, military operations in urban terrain (MOUT), and military operations in open desert conditions. Field training is conducted with various weapons and combat systems, including small arms, shoulder-fired guided missiles, aircraft weapon systems, vehicles, artillery, and tanks. Training activities may use live ammunition or may

include blank rounds, simulated munitions, smoke, pyrotechnics, and riot control agents as identified by unit authorization or operational test plan.

Force on force training does not involve live fire. An eye-safe multiple integrated laser engagement system is used to determine weapons hits and casualties. Force on force training does use blanks, pyrotechnics, smoke, illumination, and grenade and IED simulators.

Training exercises may occur outside of designated LTAs and FOBs. When training is conducted outside of these designated areas, military personnel and equipment are limited to existing roads and trails and no off-road movement is allowed.

2.3.3.9 Base Support Operations

Many facilities are operated or maintained to support the activities of the six main functions listed above. These facilities include instrumentation, such as radar tracking and vectoring, real-time meteorological data, target arrays, telemetry capabilities, and video scoring. Other support operations include several vehicle and munitions maintenance facilities, ranges, heliports and airfields, various test facilities and laboratories, data collection and processing facilities, pest management, solid waste disposal, wastewater disposal, water distribution, storage facilities, and road and target maintenance. Support services are also provided for base personnel in the areas of administration, recreation, utilities, housing, health, education, and retail stores.

2.3.4 Status of the Analysis of the No Action Alternative

The No Action Alternative would not meet the purpose and need for the project. The No Action Alternative would result in YPG continuing to operate with facilities and infrastructure in need of improvement or modification to meet future mission needs. The No Action Alternative, however, provides the baseline against which the potential impacts of the other considered alternatives can be evaluated. The No Action Alternative is carried forward for detailed analysis in this FPEIS.

2.4 Proposed Action

The Proposed Action includes all components identified in this FPEIS, including new construction and associated demolition, testing and training activities occurring on YPG, and new testing and training proposed to meet anticipated testing or training needs. The Preferred Alternative, which is described in detail in Section 2.10, is a subset of the Proposed Action. Tables 2-1 through 2-6 indicate where the original Proposed Action has been modified under the Preferred Alternative.

Under the Proposed Action, there would be no increase in the number of military and civilian personnel assigned to YPG and these activities would not induce growth in the region. There could be an increase in transient personnel with increased testing and training capacity, but these personnel would be onsite only for short periods. Potential increases in operational testing to provide realistic in-theater conditions to support testing would not result in personnel increases.

Current testing and training activities, which were discussed previously as part of the No Action Alternative, are identified in Appendix B and locations for these activities are shown on Figures 2-4 through 2-12. No additional use of DU materials would occur under the Proposed Action.

The construction, testing, and training activities planned to occur in the Laguna Region under the Proposed Action that are analyzed in detail are identified in Table 2-1, with the locations shown on Figure 2-13. The construction, testing, and training activities planned to occur in the Laguna Region under the Proposed Action that are analyzed programmatically are identified in Table 2-2, with the locations shown on Figure 2-13. The identifiers for each project in Tables 2-1 and 2-2 correspond to the identifiers on Figure 2-13. These activities include infrastructure construction, expansion of test areas to accommodate fluctuations in testing and training, and planned changes in testing and training activities, including increases in testing of conventional and lighter-than-air UAS systems.

The construction, testing, and training activities planned to occur in the Cibola Region under the Proposed Action that are analyzed in detail are identified in Table 2-3, with the locations shown in Figure 2-14. The construction, testing, and training activities planned to occur in the Cibola Region under the Proposed Action that are analyzed programmatically are identified in Table 2-4, with the locations shown in Figure 2-14. The identifiers for each project in Tables 2-3 and 2-4 correspond to the identifiers on Figure 2-14. These activities include infrastructure construction, expansion of test areas (1) to accommodate fluctuations in testing and training and planned changes in testing and training activities, and (2) to provide appropriate supporting infrastructure for continued testing and training activities, such as appropriate POL storage at remote testing locations.

The construction, testing, and training activities planned to occur in the Kofa Region under the Proposed Action that are analyzed in detail are identified in Table 2-5, with the locations shown in Figure 2-15. The construction, testing, and training activities planned to occur in the Kofa Region under the Proposed Action that are analyzed programmatically are identified in Table 2-5, with the locations shown in Figure 2-15. The identifiers for each project in Tables 2-5 and 2-6 correspond to the identifiers on Figure 2-15. These activities include infrastructure construction, expansion of test areas to accommodate fluctuations in testing and training, and planned changes in testing and training activities.

Tables 2-1, 2-3, and 2-5 provide project-specific impacts of the activities that are analyzed in detail and these impacts are discussed in greater detail in Appendix C. The text discussion in Section 3 provides a general discussion of impacts that is more programmatic in nature.

TABLE 2-1
Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Impacts ^{b, c}
L001-a	Construct building, concrete pad, shade structure, and solar lights at K-9 Village.	<p>Minor construction-related soil and vegetation disturbance at K-9 Village (building 900 square feet [ft²], concrete pad 40,000 ft², shade structure 400 ft²).</p> <p>Minor construction-related air emissions.</p> <p>Potential for increased stormwater runoff from increased impervious area.</p> <p>Work within existing urban combat training area would have temporary displacement of nearby wildlife with no population-level impacts.</p> <p>Safety benefit from shade to reduce heat stress.</p>

TABLE 2-1
Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Impacts ^{b, c}
L002-a	Construct Runway 18/36 extension, and realign Barranca Road at LAAF.	Construction-related soil and vegetation disturbance (2,000-ft runway extension 2.75 ac, realignment of Barranca Road 3.37 ac). Minor construction-related air emissions. Temporary disruption of on-post traffic. Potential for increased stormwater runoff from increased impervious area. Work within this high human activity area would have temporary displacement of nearby wildlife with no population-level impacts.
L003	Construct outdoor eating area at the Roadrunner Café.	Minor construction-related soil and vegetation disturbance (840 ft ²). Minor construction-related air emissions. Potential for increased stormwater runoff from increased impervious area.
L004	Construct office building next to Building 2968.	Construction-related soil disturbance in previously disturbed area (office building 4,000 ft ²). Construction-related emissions. Potential for increased stormwater runoff from increased impervious area. Cantonment area work would not have detectable impacts on wildlife.
L005	L005-a: Construct medium and large storage buildings. L005-b: Construct 2 office buildings. L005-c: Construct Air Delivery Guided Test Facility next to Building 2970.	Construction-related soil disturbance in previously disturbed area (medium storage building 7,200 ft ² , large storage building 9,600 ft ² , 2 office buildings totaling 4,000 ft ² , and Air Delivery Guided Test Facility 35,900 ft ²). Construction-related emissions. Increased impervious area.
L006	L006-a: Construct Flight Detachment Maintenance Building. L006-b: Construct Wild Horse Café. L006-c: Construct antiterrorism/force protection (AT/FP) parking improvements.	Construction-related soil disturbance in previously disturbed area (Flight Detachment Maintenance Building 18,000 ft ² , Wild Horse Café 3,200 ft ² , and parking improvements 101,560 ft ² in previously disturbed area). Construction-related emissions. Increased impervious area.
L007	L007-a: Construct helicopter parking at CDH. L007-b: Construct UAS parking, UAS storage facility, and UAS maintenance hangar at CDH. L007-c: Construct privately owned vehicle (POV) parking at CDH. L007-d: Relocate C-130 Combat Aircraft Loading Area CALA) to CDH.	Construction-related soil and vegetation disturbance (helicopter and UAS parking 61,000 ft ² , POV parking 77,000 ft ² , UAS storage facility 14,400 ft ² , UAS maintenance hangar 43,500 ft ² , C-130 CALA relocation 240,200 ft ²). Construction-related emissions. Increased impervious area.
L008-a	Construct access control point (ACP) at CDH.	Construction-related soil and vegetation disturbance (improved ACP 19,500 ft ²). Construction-related emissions.
L009	Construct warehouse at YTC.	Construction-related soil and vegetation disturbance (warehouse 7,750 ft ²). Construction-related emissions. Increased impervious area.

TABLE 2-1
Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Impacts ^{b, c}
L010	Construct Instrumentation Development Facility at YTC.	Construction-related soil and vegetation disturbance (Instrumentation Development Facility 32,500 ft ²). Construction-related emissions. Increased impervious area.
L011	L011-a: Construct tracked vehicle trail at YTC. L011-b: Construct office at YTC.	Construction-related soil and vegetation disturbance (tracked vehicle trail 45,000 ft ² , office 400 ft ²). Construction-related emissions. Increased impervious area.
L012	L012-a: Construct hotel at the MAA. L012-b: Construct Emergency Operations Center (EOC) at MAA. L012-c: Construct addition to youth services center at MAA. L012-d: Construct ACP improvements at MAA. L012-e: Construct child development center for school-aged services at MAA. L012-f: Construct outdoor eating area at Coyote Lanes bowling alley.	Construction-related soil and vegetation disturbance (hotel 15,000 ft ² , EOC 6,600 ft ² , youth services center 16,150 ft ² , and ACP improvements 19,500 ft ² , child development center 59,261 ft ² , outdoor eating area 3,169 ft ²). Construction-related emissions. Increased impervious area.
L013-a	L013-a: Construct additional fencing and support facilities at the Threat Systems and Target Simulations Buildings 3572 and 3574.	Construction-related soil and vegetation disturbance (fencing 1,420 ft ² , support facilities 50,000 ft ²).
L014	L014-a: Construct aircraft shelter, command and control building, and clear a UAS launch/recovery area at Comanche Flats. L014-b: Construct multiple buildings, concrete pad, water tank, POL storage area, and graded parking area at Comanche Flats.	Construction-related soil and vegetation disturbance (aircraft shelter 52,500 ft ² , command and control building 2,000 ft ² , UAS launch/recovery area—clearing vegetation 162 ac and adding 282,600 ft ² of aggregate base coat (ABC) in center of area, office building 600 ft ² , maintenance building 900 ft ² , pad 1,000 ft ² , water tank 30,000 gallons 1,000 ft ² , POL storage 900 ft ² , graded parking 7,500 ft ²). Construction-related emissions. Increased impervious area.
L015-a	Repair landing pad and construct building at K-9 Village.	Construction-related soil and vegetation disturbance (repair landing pad 90,000 ft ² , building 2,500 ft ²). Construction-related emissions. Increased impervious area.
L016-a	Construct building, concrete or asphalt pad, shade structure, and install solar lights at Site 2.	Construction-related soil and vegetation disturbance at site (building 900 ft ² , pad 40,000 ft ² , shade structure 400 ft ²). Construction-related emissions. Increased impervious area.
L017	Construct GCSs for UAS operations at Telemetry (TM) Site 4.	Construction-related soil and vegetation disturbance (GCSs 2,500 ft ²).
L018	Construct concrete or asphalt pad and sensor tower east of existing sensor test building at Sidewinder Sensor Site.	Construction-related soil and vegetation disturbance (pad 900 ft ² and 65-ft to 130-ft sensor tower 100 ft ²). Increased impervious area.
L019	Expand and combine West LA LTA, K-9 Village LTA, Site 2 LTA, and Site 4 LTA.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (6,521 ac). Note, additional NEPA analysis would be required for any new bivouac areas. The detailed analysis only addresses dismounted maneuvers.

TABLE 2-1
Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Impacts ^{b, c}
L020	Upgrade equipment at Tire X-Ray Facility (Building 2310).	None, impacts confined to interior of existing facility.
L021	Construct solar chamber at Climatic Simulation Facilities (Building 3527).	Construction-related soil disturbance in previously disturbed area (solar chamber 15,000 ft ²). Construction-related emissions. Increased impervious area.
L022	Relocate dust chamber from Building 3352 to near Buildings 3357 and 3494 (Rough Handling).	Construction-related soil disturbance in previously disturbed area (dust chamber 15,000 ft ²). Construction-related emissions. Increased impervious area.
L023	L023-a: Improve ACP at the Kofa cantonment. L023-b: Construct joint wash rack for tracked and government owned vehicles (GOVs) at the Kofa cantonment. L023-c: Construct electric substation protection and electronics expansion at the Kofa cantonment. L023-d: Construct Howitzer Support/Acceptance Facility at the Kofa cantonment. L023-e: Construct open storage facility at the Kofa cantonment.	Construction-related soil disturbance in previously disturbed area (ACP improvements 19,500 ft ² , joint wash rack 900 ft ² , electronics expansion 10,500 ft ² , Howitzer Support/Acceptance Facility 22,500 ft ² , storage facility 70,000 ft ²). Construction-related emissions. Increased impervious area.
L024	Relocate Semi-trailer Delivery Safe Haven.	Construction-related soil disturbance in previously disturbed area (11,000 ft ²). Construction-related emissions. Increased impervious area.
L025	L025-a: Construct Aberdeen Road flood upgrades. L025-b: Construct range road improvements.	Construction-related soil disturbance in previously disturbed area (Aberdeen Road flood upgrades 0.5 mile, range road improvements 31.5 miles). Construction-related emissions. Increased impervious area. Improved traffic flow. Improved safety.
L026	Construct munitions treatment facility.	Construction-related soil disturbance in previously disturbed area (60,000 ft ²). Construction-related emissions. Increased impervious area.
L027	Construct gun storage facility at the Kofa cantonment.	Construction-related soil disturbance in previously disturbed area (22,000 ft ²). Construction-related emissions. Increased impervious area.
L028	Construct five ammunition magazines near the Kofa cantonment.	Construction-related soil disturbance in previously disturbed area (4,000 ft ² each totaling approximately 22,000 ft ²). Construction-related emissions. Increased impervious area.
L029	Construct optical maintenance facility, graded parking area with power pole farm, and perimeter fencing.	Construction-related soil and vegetation disturbance (building 7,500 ft ² , parking area 90,342 ft ² , fencing 2,400 ft ²). Construction-related emissions. Increased impervious area.
L030	L030: Expand LTA to support operationa	Vegetation and soil disturbance from dismounted

TABLE 2-1
Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Impacts ^{b, c}
	testing and dismounted maneuvers at Muggins/Middle East (only one alternative would be selected): L030-a: 16,640 ac L030-b: 6,331 ac	maneuvers and bivouacs (up to 16,640 ac). Note, additional NEPA analysis would be required for any new bivouac areas. The detailed analysis only addresses dismounted maneuvers. The Preferred Alternative is to implement the smaller expanded LTA, which would impact only 6,331 ac.
L031	L031: Construct MFFS Dining Facility (DFAC) (only one option to be selected): L031-a: at Location Option 1 L031-b: at Location Option 2 L031-c: at Location Option 3	Construction-related soil and vegetation disturbance (building 48,979 ft ²). Construction-related emissions. Increased impervious area. The Preferred Alternative is to implement Option 1.
L032	Expand Bravo LTA.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (828 ac).
L033	Expand Hill 630 LTA.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (1,141 ac).
L034	L034: Construct MFFS Ready Room (only one option to be selected): L034-a: at Location Option 1 L034-b: at Location Option 2 L034-c: at Location Option 3	Construction-related soil and vegetation disturbance (48,979 ft ²). Construction-related emissions. Increased impervious area. The Preferred Alternative is to implement Option 1.
L035	Construct Armament Test Operations and Analysis Facility.	Construction-related soil and vegetation disturbance (60,000 ft ²). Construction-related emissions. Increased impervious area.
L036	Construct Shower Facility at LAAF FOB area.	Construction-related soil and vegetation disturbance. Construction-related emissions. Increased impervious area.
L040	Construct DZ near LAAF (984 ft x 1,969 ft).	Construction-related soil and vegetation disturbance (44.5 ac). Construction-related emissions.
L041	Construct air delivery storage and laboratory facility behind Building 2970.	Construction-related soil and vegetation disturbance (up to 14,851 ft ²). Construction-related emissions. Increased impervious area.
L042	Upgrade facility to an office and hangar in Building 3025.	None, all work confined to interior remodeling of existing facilities.

^a Work proposed within existing buildings is not shown on maps because there would be no environmental impacts.

^b Measurements are approximate.

^c Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.

TABLE 2-2
Proposed Action Activities Analyzed Programmatically—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Principal Impacts ^{b, c}
L001-b	Install hard power/fiber, communication service at K-9 Village southern area.	Construction-related soil and vegetation disturbance along utility lines (4,395 ft ²). Construction-related emissions. Increased impervious area. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
L002-b	Install hard power at LAAF.	Construction-related soil and vegetation disturbance along utility lines 12,500 ft ² . Construction-related emissions. Temporary disruption of on-post traffic. Increased impervious area.
L008-b	Construct roadway drainage improvements at CDH.	Construction-related soil and vegetation disturbance from roadway drainage improvements 370,000 ft ² . Construction-related emissions.
L013-b	Install hard power, fiber, and telephone service to the Threat Systems and Target Simulations Buildings 3572 and 3574.	Construction-related soil and vegetation disturbance along utility lines 100 ft ² . Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
L014-c	Install hard power/fiber and communication service at Comanche Flats.	Construction-related soil and vegetation disturbance along utility lines (7,560 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
L015-b	Install hard power, fiber, and communication service at K-9 Village northern area.	Construction-related soil and vegetation disturbance along utility lines (2,962 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
L016-b	Install hard power, fiber, and communication service at Site 2.	Construction-related soil and vegetation disturbance along utility lines (250 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
L037	Construct vehicle test course and establish LTA.	Construction-related soil and vegetation disturbance (up to 5,171 ac). Construction-related emissions.
L038	Construct vehicle test course and establish LTA.	Construction-related soil and vegetation disturbance (up to 1,550 ac). Construction-related emissions.
L039	Construct vehicle test course and establish LTA.	Construction-related soil and vegetation disturbance (up to 2,318 ac). Construction-related emissions.
L100	L100-a: Construct addition to Building 3021. L100-b: Construct Future Combat Systems (FCS) Rotary Class IV hangars, and FCS. Large Class IV hangar to the west of LAAF L100-c: Construct large transient UAS hangar with pad access west of LAAF. L100-d: Construct aviation growth hangar at LAAF. L100-e: Construct administrative support building to the west of LAAF.	Construction-related soil disturbance in previously disturbed area (addition to Building 3021 5,972 ft ² , FCS Rotary Class IV hangars totaling 17,600 ft ² ; FCS large Class IV hangar 5,972 ft ² ; UAS hangar 6,200 ft ² , aviation growth hangar 20,250 ft ² , administrative support building 38,500 ft ² , USASOC Tactical Hangar 67,774 ft ²). Construction-related emissions. Increased impervious area.

TABLE 2-2
Proposed Action Activities Analyzed Programmatically—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Principal Impacts ^{b, c}
	L100-f: Construct U.S. Army Special Operations Command (USASOC) Tactical Hangar at LAAF.	
L101	L101-a: Construct motor pool to the north of LAAF. L101-b: Construct addition to ammunition building rigging bay to the north of LAAF. L101-c: Construct access from Ocotillo Road and ammunition building access road improvements to the north of LAAF. L101-d: Construct storage yard improvements to the north of LAAF.	Construction-related soil disturbance in previously disturbed area (motor pool 26,300 ft ² , addition to rigging bay 10,200 ft ² , access from Ocotillo Road 5,600 ft in length [180,000 ft ²], access road improvements 700 ft in length), storage yard improvements 60,500 ft ² . Construction-related emissions. Increased impervious area.
L102	L102-a: Construct new MFFS Terminal at LAAF/MAA. L102-b: Construct consolidated rigger facility at LAAF/MAA. L102-c: Construct UAS airfield, hangars, taxiways, and UAS flight test area and other supporting infrastructure at LAAF/MAA. L102-d: Construct CASA Transport Aircraft Hangar at LAAF/MAA.	Construction-related soil disturbance in previously disturbed area (MFFS Terminal 28,000 ft ² , consolidated rigger facility 15,500 ft ² , UAS taxiways 2,000 ft in length [120,000 ft ²], UAV airfield and hangars 403,250 ft ² , UAV flight test area and other supporting infrastructure 76,000 ft ²), CASA Transport Aircraft Hangar 153,858 ft ² . Construction-related emissions. Increased impervious area.
L103	L103-a: Construct fire station at CDH. L103-b: Construct fuel point at CDH. L103-c: Construct C-130 parking at CDH. L103-d: Construct hot cargo refueling area at CDH. L103-e: Construct dining facility at CDH. L103-f: Construct airship hangar at CDH.	Construction-related soil disturbance in previously disturbed area (Fire station, fuel point, and C-130 parking, totaling 410,000 ft ² , hot cargo refueling area 240,200 ft ² , dining facility 4,800 ft ² , and airship hangar 1,683,500 ft ²). Construction-related emissions. Increased impervious area. Improved safety.
L104	Construct water treatment facility and a wastewater evaporative pond at CDH.	Construction-related soil and vegetation disturbance (77,100 ft ²). Construction-related emissions. Increased impervious area.
L105	Construct crosswind runway at CDH.	Construction-related soil disturbance in previously disturbed area (6,000 ft in length [300,000 ft ²]). Construction-related emissions. Increased impervious area.
L106	L106-a: Construct 4 administrative support buildings. L106-b: Construct Installation Logistics Complex.	Construction-related soil disturbance in previously disturbed area (4 administrative support buildings totaling 44,465 ft ² , Installation Logistics Complex 76,833 ft ²). Construction-related emissions. Increased impervious area.
L107	Construct improvements to Cox Field, AT/FP, and Garrison headquarters, and convert Street D to pedestrian walkway.	Construction-related soil disturbance in previously disturbed area (Cox Field 343,500 ft ² , AT/FP 12,000 ft ² , Garrison headquarters 17,200 ft ² , Street D 6,900 ft ²). Short-term on-post traffic disruption. Construction-related emissions. Increased impervious area.
L108	All activities in Kofa cantonment. L108-a: Improve truck ACP. L108-b: Expand range communication.	Construction-related soil and vegetation disturbance (truck ACP 12,000 ft ² , range communication 20,000 ft ² , sand blasting 44,000 ft ² , optics 370,000 ft ² , second

TABLE 2-2
Proposed Action Activities Analyzed Programmatically—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities ^a	Potential Principal Impacts ^{b, c}
	L108-c: Expand sand blasting facility. L108-d: Consolidate optics. L108-e: Construct second GOV and tracked vehicle maintenance facility.	maintenance facility 122,230 ft ² . Construction-related emissions. Increased impervious area.
L109	Construct wax plant expansion at the Kofa cantonment.	Construction-related soil disturbance in previously disturbed area (40,500 ft ²). Increased impervious area.
L110	Construct additional ammunition plant similar to Building 3482 and air-conditioned chamber near the Kofa cantonment.	Construction-related soil disturbance in previously disturbed area (ammunition plant 150,000 ft ² and air-conditioned chamber 40,000 ft ²). Construction-related emissions. Increased impervious area.
L111	Upgrade equipment and electrical supply at Physical Test Facility (Buildings 3490 and 3130).	None, all work confined to interior remodeling of existing facilities.
L112	Upgrade equipment in vibration test facilities (Buildings 3496, 3495, 3594).	None, all work confined to interior remodeling of existing facilities.
L113	Upgrade equipment at radiography facility (Building 3493).	None, all work confined to interior remodeling of existing facilities.

^a Work proposed within existing buildings is not shown on maps because there would be no environmental impacts.

^b Measurements are approximate.

^c Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
C002	Construct new DZs: C002-a—South Urban DZ (1,640-ft radius) south of Urban DZ. C002-b—Tomahawk Circular DZ 769 (2,297-ft radius). C002-c—Tombstone DZ (984-ft radius). C002-d—Village Circular DZ (984-ft radius). C002-e—Abken DZ (1,640-ft radius). C002-f—Urban Circular Joint Precision Airdrop System (JPADS) DZ (984-ft radius).	Activity-related soil and vegetation disturbance (South Urban DZ 194 ac, Tomahawk Circular DZ 380 ac, Tombstone DZ 70 ac, Village Circular DZ 70 ac, Abken DZ 194 ac, and Urban Circular JPADS DZ 70 ac). Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
C003	C003-a—Establish small arms impact areas for inert munitions at JERC I. C003-b—Establish small arms impact areas for inert munitions at JERC II. C003-c—Establish small arms impact areas for inert munitions at JERC III.	Inert fire weapons use at JERC I: impact areas 62 ac, 62 ac, and 15 ac; JERC II 62 ac; and JERC III 50 ac. These small arms impact areas would use collection boxes for fired ammunition and would be cleaned between tests. Potential air emissions from obscurants. Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded training and training activities. Disturbance would be episodic and may be separated widely in space or time.
C004-a	Construct facilities at Gauna Peak.	Construction-related soil and vegetation disturbance at site (facilities 2,500 ft ²). Construction-related emissions. Increased impervious area. Long-term minor impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
C005-a	Construct building at Site 18.	Construction-related soil and vegetation disturbance at site (building 1,600 ft ²). Construction-related emissions. Increased impervious area. Long-term minor impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
C006	Establish Phoenix West Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (262 ac). Inert and explosive fire weapons use. Potential air emissions from obscurants.
C007-a	Construct runway extension, aircraft shelter, and POL storage at Phoenix UAS site.	Construction-related soil and vegetation disturbance (runway extension 75,000 ft ² , aircraft shelter 8,000 ft ² , POL storage 900 ft ²). Construction-related emissions. Increased impervious area. Reduced potential for POL spills.
C008-a	Construct building at Site 16.	Construction-related soil and vegetation disturbance at site (building 1,600 ft ²). Construction-related emissions. Increased impervious area. Long-term minor impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
C009	Establish North UAS Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (275 ac). Inert and explosive fire weapons use. Potential air emissions from obscurants. Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
C010	Construct aircraft shelter, POL storage, and graded parking lot at North UAV Complex.	Construction-related soil and vegetation disturbance (aircraft shelter 43,500 ft ² , POL storage 900 ft ² , and parking lot 7,500 ft ²). Construction-related emissions. Increased impervious area. Reduced potential for POL spills. Long-term minor impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
C011	Establish La Posa West Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (395 ac). Inert and explosive fire weapons use. Potential air emissions from obscurants. Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time.
C012-a	Construct building and concrete pad at PSS Test Area (west of La Posa DZ).	Construction-related soil and vegetation disturbance at site (building 2,500 ft ² , pad 5,000 ft ²).
C014	C014-a: Install shade structure at Stinger Pole Target Area.	Minimal soil and vegetation disturbance to place support poles (shade structure 400 ft ²).
C015	Construct Intelligence, Surveillance, and Reconnaissance/Electro-optical (ISR/EO) Ground Truth Reference Sites at: C015-a: Yuma Wash (33.156, -114.485) C015-b: Middle Mountain Road (33.063, -114.358) C015-c: Mule Wash (33.432, -114.503) C015-d: (33.446, -114.471) C015-e: (33.477, -114.286) C015-f: (33.444, -114.325) C015-g: (33.448, -114.275) C015-h: (33.421, -114.279) C015-i: (33.408, -225.360) C015-j: (33.389, -114.303) C015-k: (33.387, -114.366) C015-l: (33.347, -114.286) C015-m: (33.297, -114.395) C015-n: (33.165, -114.480) C015-o: (33.122, -114.299) C015-p: (33.090, -114.447) C015-q: (33.081, -114.353) C015-r: (33.967, -114.422)	Construction-related soil and vegetation disturbance (each site—2,000 ft ²).
C016	Rebuild target for long-range missile firing at Maverick Target.	None—existing target to be rebuilt.
C017-a	Construct building, bomb-proof shelter, shade structure, concrete or asphalt pad, and sensor tower at camera mount (CM) 4.	Construction-related soil and vegetation disturbance at site (building 1,500 ft ² , bomb-proof shelter 2,000 ft ² , shade structure 400 ft ² , pad 40,000 ft ² , and 65-ft to 130-ft sensor tower 100 ft ²). Construction-related emissions. Increased impervious area.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
C018	Construct landing pad at CM 1.	Construction-related soil and vegetation disturbance (pad 90,000 ft ²). Increased impervious area.
C019	Construct building and concrete pad at Z-12.	Construction-related soil and vegetation disturbance (building 2,000 ft ² and pad 90,000 ft ²). Construction-related emissions. Increased impervious area.
C020-a	Construct sensor tower, buildings, air-conditioning, and concrete pad at Site 9.	Construction-related soil and vegetation disturbance at site (sensor tower 65-ft to 130-ft tall 100 ft ² , buildings 2,000 ft ² , air-conditioned facility 1,000 ft ² , pad 40,000 ft ²). Increased impervious area.
C021 (activities centered at - 114.356, 33.077)	C021-a: Construct secure building with reinforced concrete floors and ramp to building. C021-b: Construct multiple buildings, water tank, POL storage area, and graded parking. C021-c: Construct aircraft shelter. C021-d: Clear launch/recovery area.	Construction-related soil and vegetation disturbance (total area for C021-a through C021-d: 193,284 ft ²). Construction-related emissions. Increased impervious area. Reduced potential for POL spills.
C022 (activities centered at - 114.36, 33.074)	C022-a: Construct building, concrete slab, walkways, and fencing. C022-b: Construct aircraft shelter. C022-c: Construct POL storage. C022-d: Relocate meteorological tower. C022-e: Construct runway expansion and taxiway.	Construction-related soil and vegetation disturbance at site (command and control room 2,000 ft ² , walkways 1,800 ft ² , 10,000 ft ² concrete slab, aircraft shelter 12,000 ft ² , POL storage area 900 ft ² , meteorological tower 100 ft ² , runway expansion 725,000 ft ² , and taxiway 400,000 ft ²). Construction-related emissions. Increased impervious area. Reduced potential for POL spills.
C023 (activities centered at - 114.363, 33.051)	C023-a: Construct multiple buildings, water tank, POL storage area, and graded parking. C023-b: Construct aircraft shelter. C023-c: Clear a launch/recovery area.	Construction-related soil and vegetation disturbance (multiple buildings 2,500 ft ² each, 30,000 gal water tank 1,000 ft ² , POL storage area 900 ft ² , graded parking area 7,500 ft ² , aircraft shelter 43,500 ft ² , and launch/recovery area 22.8 ac). Construction-related emissions. Increased impervious area. Reduced potential for POL spills.
C024	C024-a: construct aircraft shelter, concrete pad, graded parking area near Inverted Range Control Center (IRCC) Tank Maintenance and Storage Ramada. C024-b: fence and install solar lights, around IRCC Tank Maintenance and Storage Ramada.	Construction-related soil and vegetation disturbance (shelter 1,600 ft ² , pad 90,000 ft ² , graded parking area 250,000 ft ² , and fence 4,000 ft ²). Construction-related emissions. Increased impervious area. Reduced long-term use of fossil fuels by using solar lights.
C025-a	Construct runway, taxiway, aircraft shelter, and building at IRCC.	Construction-related soil and vegetation disturbance at site (runway 27.5 ac, taxiway 14 ac, aircraft shelter 12,000 ft ² , and building 2,000 ft ²). Construction-related emissions. Increased impervious area.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
C026	C026-a: Construct ramp to existing building, and rollup door to existing building, and install solar lights at Site 10 Missile Test Facility. C026-b: Construct concrete landing pad.	Construction-related soil and vegetation disturbance at site (ramp 500 ft ² and landing pad 90,000 ft ²). Increased impervious area. Reduced long-term use of fossil fuels by using solar lights.
C027	C027-a: Expand flat area on top of hill, and construct facility, concrete pad, and sensor tower at Site 12. C027-b: Construct road leading from the sensor building on the top of the hill at Site 12A down to the Persistent Threat Detection System (PTDS) Site.	Construction-related soil and vegetation disturbance (total area for C027-a: 10.2 ac and for road 34,850 ft ²). Increased impervious area.
C029-a	Construct buildings and concrete pad at Aerostat Mooring Site.	Construction-related soil and vegetation disturbance at site (buildings 2,000 ft ² , pad 10,000 ft ²). Construction-related emissions. Increased impervious area.
C030-a	Construct aircraft shelter, multiple buildings, water tank, POL storage area, and graded parking area, and clear a launch/recovery area east of Rocket Alley.	Construction-related soil and vegetation disturbance at site (aircraft shelter 52,500 ft ² , command and control building 2,000 ft ² , office building 600 ft ² , maintenance building 900 ft ² , water tank 30,000 gallons 1,000 ft ² , POL storage area 900 ft ² , graded parking area 7,500 ft ² , and UAS launch/recovery area clearing vegetation of 162 ac and adding 282,600 ft ² of ABC in center of area). Construction-related emissions. Increased impervious area. Reduced potential for POL spills.
C031	Utilize Site 6 as a meteorological station.	None, existing disturbed area.
C032	Renovate Large Multi-Purpose Environmental Chamber (Building 6015).	None, action limited to renovation within existing building footprint.
C033-a	Construct aircraft shelter, multiple buildings, concrete pad, water tank, POL storage area, and graded parking area, and clear a launch/recovery area at C-17.	Construction-related soil and vegetation disturbance at site (aircraft shelter 52,500 ft ² , command and control building 2,000 ft ² , office building 600 ft ² , maintenance building 900 ft ² , pad 5,000 ft ² , 30,000-gallon water tank 1,000 ft ² , POL storage 900 ft ² , graded parking area 7,500 ft ² , and UAS launch/recovery area clearing vegetation of 162 ac and adding 282,600 ft ² of ABC in center of area). Construction-related emissions. Increased impervious area. Reduced potential for POL spills. Long-term minor impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
C034-a	Expand size of Graze Range Impact Areas by consolidating 7 individual impact areas into a single larger area.	Long-term soil and vegetation disturbance from testing and training activities (626 ac under the Preferred Alternative, 15 ac less than originally proposed). Inert and explosive fire weapons use. Potential air emissions from obscurants.
C035	Expand Combined Live Fire Exercise Range at OP-9 by consolidating 2 designated impact areas and Prospect Square.	Long-term soil and vegetation disturbance from testing and training activities (200 ac). Inert and explosive fire weapons use. Potential air emissions from obscurants.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
C036	Increase use of Prospect Square for bombing or aircraft gunnery.	None, inert and explosive fire weapons use is authorized for this area.
C038	Construct medical evacuation (MEDEVAC) pad.	Construction-related soil and vegetation disturbance at site (MEDEVAC pad 1,000 ft ²). Increased impervious area.
C039	Construct air-conditioned storage facility at Castle Dome Annex (CDA).	Construction-related soil and vegetation disturbance at site (8,000 ft ²). Construction-related emissions. Increased impervious area.
C041	Expand LTA to support operational testing and dismounted maneuver training at Middle Mountain.	Long-term soils disturbance from dismounted maneuver activities (11,230 ac). Note, additional NEPA analysis would be required for any new bivouac areas. The detailed analysis only addresses dismounted maneuvers,
C043	Temporarily bury simulated missiles, explosives, etc. off roads for sensor testing. Locations for temporary burials would vary and be determined by specific testing requirements. Locations include: C043-a—All JERC I roads. C043-b—All JERC II roads. C043-c—All JERC III roads.	Long-term soil and vegetation disturbance from recurring testing activities. Disturbance would be episodic and may be separated widely in space or time.
C044	C044-a -Clear MEDEVAC helicopter landing pad at JERC I for evacuations. C044-b -Clear MEDEVAC helicopter landing pad at JERC II for evacuations. C044-c -Clear MEDEVAC helicopter landing pad at JERC III for evacuations.	Construction-related soil and vegetation disturbance (2,500 ft ² each).
C046	Expand North UAV Compound C046-a: Construct concrete pad. C046-b: Grade project area and install fencing. C046-c: Construct asphalt taxiway.	Construction-related soil and vegetation disturbance for pad (23,808 ft ²), project area and fencing (25,704 ft ²), and taxiway (62,500 ft ²). Increased impervious area. Long-term minor impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
C047	Create 23 TGP's at: C047-a: Rocket Alley C047-b: CM 9 East C047-c: Cibola Target Boundary GP C047-d: Site 16 C047-e: CM 9 West C047-f: C17 (North and South) C047-g: Mound C Archer GP C047-h: Mound C GP C047-i: CM 1 West C047-j: La Posa DZ C047-k: Site 8 GP C047-l: West Target Road GP C047-m: BM1072 C047-n: Excalibur SW GP C047-o: LADZ GP C047-p: Site 18 GP	Soil and vegetation disturbance (up to 2.2 ac at each site). Any weapons fire would be directed into existing authorized impact areas.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
	C047-q: 2.75 Rocket GP C047-r: Ehrenberg GP C047-s: DFR GP C047-t: La Posa South DZ C047-u: Water Tank GP C047-v: LA DZ East C047-w: C17 North M777LWH GP.	
C049	Install acoustic and seismic sensor at Horizontal Impact Area.	Very minor construction-related soil and vegetation disturbance.
C050-a	C050-a: Construct building and UAS launch/recovery site at Simulated Minefield Site to support UAS operations.	Construction-related soil and vegetation disturbance at site (building 1,600 ft ² and UAS launch/recovery site—vegetation clearing 162 ac and adding 282,600 ft ² of ABC in center of area). Construction-related emissions. Increased impervious area.
C051	Install shade structure at Lightweight Shock Facility.	Construction-related soil and vegetation disturbance (400 ft ²).
C052	Establish CM 7 Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (1,270 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C053	Establish CM 4 North Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (1,510 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C054	Construct Yuma Wash Engineering Common Use Test (ECUT) expansion.	Construction-related soil and vegetation disturbance (78,400 ft ²).
C055	Establish Multi-Purpose North Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (567 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C056	Establish Multi-Purpose South Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (3,823 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C057	Expand Rocket Alley Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (2,127 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C058	Establish Aerial Weapons Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (2,452 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C059	Establish East Target Road Impact Area.	Long-term soil and vegetation disturbance from testing and training activities (2,531 ac). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C061	Create LTA to support operational testing and dismounted maneuver training at	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (8,437 ac). Note, additional NEPA analysis would be required for any bivouac

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
	JERC I/ Saderville.	areas. The detailed analysis only addresses dismounted maneuvers. Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time.
C062	Create LTA to support operational testing and dismounted maneuver training at JERC II.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (3,503 ac). Note, additional NEPA analysis would be required for any bivouac areas. The detailed analysis only addresses dismounted maneuvers. Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time.
C063	Create LTA to support operational testing and dismounted maneuver training at JERC III.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (4,312 ac). Note, additional NEPA analysis would be required for any bivouac areas. The detailed analysis only addresses dismounted maneuvers. Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time.
C065	C065: Create LRA Impact Areas: C065-a: LRA Impact Area 1 C065-b: LRA Impact Area 2 C065-c: LRA Impact Area 3 C065-d: LRA Impact Area 4	Long-term soil and vegetation disturbance from testing and training activities (9.9 ac for each site). Inert and explosive weapons fire use. Potential air emissions from obscurants.
C066	C066-a: Construct aerial cable drop site for drop testing in mountains north of Prospect Square. Activity includes two cables suspended between mountain peaks, winches and pulleys for each cable, 328-ft target area.	Construction-related soil and vegetation disturbance for 2 cable sites (each 11,065 ft ²) and target area (87,855 ft ²). This location has airspace conflicts with Aviation and Air Delivery test missions and would have long-term impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities. This project would not be implemented under the Preferred Alternative.
	C066-b: Construct an approximately 2.5-mile access trail to the target area in mountains north of Prospect Square.	Construction-related soil and vegetation disturbance for access trail [3 ac]. Terrain at this location would require cost-prohibitive road work to create a passable access path and there would be long-term impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities. This project would be implemented only if C066-a is implemented.

^a The project originally proposed as C028 has been removed from direct analysis in this document. Due to a time critical need for implementation, this activity was analyzed through a separate and specific NEPA document. This activity is considered in the analysis of cumulative impacts in this document.

^b Work proposed within existing buildings is not shown on maps because there would be no environmental impacts.

^c Measurements are approximate.

^d Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

TABLE 2-3
Proposed Action Activities Analyzed in Detail—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Impacts ^{c, d}
Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.		

TABLE 2-4
Proposed Action Activities Analyzed Programmatically—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Principal Impacts ^{c, d}
C001	Construct vehicle test course.	Construction-related soil and vegetation disturbance (up to 4,644 ac). Construction-related emissions.
C004-b	Install hard power/fiber and communication service at Gauna Peak.	Construction-related soil and vegetation disturbance along utility lines (5,848 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.
C005-b	Install hard power, water, sewer, and communication service at Site 18.	Construction-related soil and vegetation disturbance along utility lines (87,990 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.
C007-b	Install hard power/fiber and communication service at Phoenix UAS site.	Construction-related soil and vegetation disturbance along utility lines (26,870 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.
C008-b	Install hard power, water, sewer, and communication service at Site 16.	Construction-related soil and vegetation disturbance along utility lines (1,050 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C012-b	Install hard power/fiber at PSS Test Area (west of La Posa DZ).	Construction-related soil and vegetation disturbance along utility lines (31,090 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.

TABLE 2-4
Proposed Action Activities Analyzed Programmatically—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Principal Impacts ^{c, d}
C013	Install hard power/fiber and communication service at ECUT area.	Construction-related soil and vegetation disturbance along utility lines (47,970 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.
C014-b	Install hard power to Stinger Pole Target Area.	Minimal soil and vegetation disturbance along utility lines (2.68 ac). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C017-b	Install telephone service at CM 4.	Construction-related soil and vegetation disturbance along utility lines (9,575 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C020-b	Install hard power and communication service at Site 9.	Construction-related soil and vegetation disturbance along utility lines (7,880 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C021-e	Install hard power/fiber and communication service centered at (-114.356, 33.077).	Construction-related soil and vegetation disturbance along utility lines (1,810 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C023-d	Install hard power/fiber and communication service centered at (-114.363, 33.051).	Construction-related soil and vegetation disturbance along utility lines (216 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C025-b	Install hard power/fiber adjacent to existing helicopter pad at IRCC.	Construction-related soil and vegetation disturbance along utility lines (1,245 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C026-c	Install hard power/fiber at Site 10 Missile Test Facility.	Construction-related soil and vegetation disturbance along utility lines (1,670 ft ²). Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C026-d	Relocate wires in vicinity of Site 10 from overhead to underground.	
C029-b	Install generators and hard power/fiber at Aerostat Mooring Site.	Construction-related soil and vegetation disturbance along utility lines (12,220 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C030-b	Install hard power/fiber and communication service east of Rocket Alley.	Construction-related soil and vegetation disturbance along utility lines (13,500 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.

TABLE 2-4
Proposed Action Activities Analyzed Programmatically—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Principal Impacts ^{c, d}
C033-b	Install hard power/fiber and communication service at C-17.	Construction-related soil and vegetation disturbance along utility lines (1,418 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.
C034-b	Install hard power to Graze Range.	Construction-related soil and vegetation disturbance along utility lines (10,123 ft ²). Construction related air emissions Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C037	Install hard power to 40-ft drop tower.	Construction-related soil and vegetation disturbance along utility lines (3,444 ft ²). Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C040	Install hard power to the Cibola Region North Range.	Construction-related soil and vegetation disturbance along utility lines (3.59 ac). Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Temporary, minor impacts to Sonoran desert tortoise habitat from vegetation disturbance; however, habitat would likely gradually recover.
C042-a	Install relocatable instrumentation sites along all JERC I roads. Instrumentation sites would be moved to accommodate specific testing requirements.	Each 20-ft instrumentation trailer requires a staging area with a 20-ft radius. Soil and vegetation disturbance (less than 0.5 ac per site).
C042-b	Install relocatable instrumentation sites along all JERC II roads. Instrumentation sites would be moved to accommodate specific testing requirements.	Each 20-ft instrumentation trailer requires a staging area with a 20-ft radius. Soil and vegetation disturbance (less than 0.5 ac per site).
C042-c	Install relocatable instrumentation sites along all JERC III roads. Instrumentation sites would be moved to accommodate specific testing requirements.	Each 20-ft instrumentation trailer requires a staging area with a 20-ft radius. Soil and vegetation disturbance (less than 0.5 ac per site).
C045	Construct MFFS Forward Staging Area.	Construction-related soil and vegetation disturbance (50 ac). Increased impervious area.
C048	Install hard power to Detection and Recognition Target Array (DET/REC) target in the Cibola Range.	Construction-related soil and vegetation disturbance along utility lines (163,310 ft ²). Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C050-b	Install hard power, water, sewer, and communication service at Simulated Minefield Site.	Construction-related soil and vegetation disturbance along utility lines (5,619 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
C060	Create LTA to support operational testing and dismounted maneuver training at TOW Town.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (29,010 ac).

TABLE 2-4
Proposed Action Activities Analyzed Programmatically—Cibola Region ^a
Yuma Proving Ground

Identifier	Proposed Activities ^b	Potential Principal Impacts ^{c, d}
C064	Create LTA to support operational testing and dismounted maneuver training at Yuma Wash.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (9,907 ac).

^a The project originally proposed as C028 has been removed from direct analysis in this document. Due to a time critical need for implementation, this activity was analyzed through a separate and specific NEPA document. This activity is considered in the analysis of cumulative impacts in this document.

^b Work proposed within existing buildings is not shown on maps because there would be no environmental impacts.

^c Measurements are approximate.

^d Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.

TABLE 2-5
Proposed Action Activities Analyzed in Detail—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Potential Impacts ^{a, b}
K001	Construct a 1,640-ft radius DZ for personnel and cargo drops in southern portion of East Arm.	Activity-related soil and vegetation disturbance at site (194 ac). Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time.
K002	Construct 1,250-ft radius DZ for personnel and cargo drops northeast of East Smart Weapons Test Range (SWTR) Impact Area.	Activity-related soil and vegetation disturbance at site (113 ac) and associated utility lines (0.37 ac).
K003	Expand munitions impact area from north boundary of Echo and Foxtrot to north boundary of contaminated area (Advanced Munitions Range).	Long-term soil and vegetation disturbance from inert and explosive munitions impact (up to 24,309 ac). Under the Preferred Alternative the expansion would be 21,377 ac, 2,932 ac less than originally proposed.
K004-a	Construct aircraft shelter, multiple buildings, water tank, POL storage area, and graded parking area, and clear a launch/recovery area at SWTR.	Construction-related soil and vegetation disturbance at site (aircraft shelter 52,500 ft ² , command and control building 2,000 ft ² , office building 600 ft ² , maintenance building 900 ft ² , 30,000-gallon water tank 1,000 ft ² , POL storage area 900 ft ² , graded parking area 7,500 ft ² , and UAS launch/recovery area—vegetation clearing of 162 ac and adding 282,600 ft ² of ABC in center of area). Construction-related emissions. Increased impervious area.
K006	Install launch/recovery systems and a GCS trailer at Tower 48.	Construction-related soil and vegetation disturbance (1,200 ft ²).
K007-a	Construct runway west of S-15 Command and Control Shelter	Construction-related soil and vegetation disturbance at site (runway 302,800 ft ²) and along utility lines (7,658 ft ²). Construction-related emissions. Increased impervious area. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
K007-b	Install hard power/fiber and communication service west of S-15 Command and Control Shelter.	
K008	Expand munitions impact area to encompass area between Impact Areas Delta and Echo.	Long-term soil and vegetation disturbance from inert and explosive munitions impacts (4,467 ac).
K009	Install fiber and permanent Improved Vehicle Tracking System (IVTS) and telemetry relays at Windy Hill.	Construction-related soil and vegetation disturbance at site and associated utility lines (3,950 ft ²).
K010	Expand munitions impact area north of North Boundary Road between GP 21A and Impact Area Alpha (Advanced Munitions Range).	Long-term soil and vegetation disturbance (980 ac) from inert and explosive munitions impact.
K011	Renovate site and construct new control room and firing chamber at GP 5.	Construction-related soil and vegetation disturbance (1,500 ft ²). Construction-related emissions. Increased impervious area.
K012-a	Construct two permanent reinforced concrete buildings to house personnel, equipment, and ammunition, and new access road at GP 18.	Construction-related soil and vegetation disturbance (7,190 ft ²). Construction-related emissions. Increased impervious area.

TABLE 2-5
Proposed Action Activities Analyzed in Detail—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Potential Impacts ^{a, b}
K013	Construct permanent reinforced concrete building and additional building to house weapons at GP 21.	Construction-related soil and vegetation disturbance (buildings 3,600 ft ² each). Construction-related emissions. Increased impervious area.
K014	Construct ISR/EO Ground Truth Reference Sites at: K014-a: (32.846, -114.336) K014-b: (32.967, -114.239) K014-c: (32.932, -114.151) K014-d: (32.822, -114.196) K014-e: (32.990, -113.955) K014-f: (32.930, -113.926) K014-g: (32.836, -114.016) K014-h: (32.867, -113.922) K014-i: (32.841, -113.866) K014-j: (32.986, -113.812) K014-k: (32.904, -113.791) K014-l: (32.020, -113.758) K014-m: (32.957, -113.666)	Construction-related soil and vegetation disturbance (each: 2,500 ft ²).
K015	Construct permanent building at GP 21A.	Construction-related soil and vegetation disturbance at previously disturbed site (3,600 ft ²). Construction-related emissions. Increased impervious area.
K016	Construct permanent building at GP 17A.	Construction-related soil and vegetation disturbance at previously disturbed site (3,000 ft ²). Construction-related emissions. Increased impervious area.
K017	Construct permanent building at GP on Growl Road in southeast corner of Echo Munitions Impact Area.	Construction-related soil and vegetation disturbance at previously disturbed site (3,000 ft ²). Construction-related emissions. Increased impervious area.
K018	Construct permanent reinforced concrete building at GP Splinter.	Construction-related soil and vegetation disturbance (3,000 ft ²). Construction-related emissions. Increased impervious area.
K019	Construct permanent reinforced concrete building at GP 19.1.	Construction-related soil and vegetation disturbance (3,000 ft ²). Construction-related emissions. Increased impervious area.
K020	Construct permanent reinforced concrete building at GP 11.1.	Construction-related soil and vegetation disturbance. (3,000 ft ²). Construction-related emissions. Increased impervious area.
K024	K024-a: Construct aerial cable drop site for drop testing in mountains south of Pole Line Road. Activity includes two cables suspended between mountain peaks, winches and pulleys for each cable, 328-ft target area. This project would be implemented under the Preferred Alternative rather than project C066.	Construction-related soil and vegetation disturbance for 2 cable sites (each 11,065 ft ²) and target area (87,855 ft ²).

TABLE 2-5
Proposed Action Activities Analyzed in Detail—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Potential Impacts ^{a, b}
	K024-b: Construct an approximately 0.6-mile access trail to the target area in mountains south of Pole Line Road.	Construction-related soil and vegetation disturbance to create access trail (0.75 ac). K024-b would be implemented only if K024-a is implemented.
K026	Expand LTA to support operational testing and dismounted maneuver training at SWTR.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (up to 8,840 ac). Under the Preferred Alternative the expansion would be 7,014 ac, 1,826 ac less than originally proposed. Note, additional NEPA analysis would be required for any new bivouac areas. The detailed analysis only addresses dismounted maneuvers,
K030	Construct runway, taxiway, aircraft shelter, command and control room, simulator training room, classroom, maintenance area, POL storage area, graded area for parking, concrete or asphalt pad, clear area for GCSs, and clear area for UAS launch/recovery at East Arm.	Construction-related soil and vegetation disturbance at site (and taxiway 3,400,000, aircraft shelter 12,000 ft ² , command and control room 2,000 ft ² , simulator training room 1,600 ft ² , classroom 2,000 ft ² , maintenance area 2,000 ft ² , POL storage area 900 ft ² , graded area for parking 7,500 ft ² , pad 250,000 ft ² , clear area for GCSs 30,000 ft ² and clear area for UAS launch/recovery 30,000 ft ²). Construction-related emissions. Increased impervious area. Long-term impacts to Sonoran desert tortoise habitat from vegetation clearing and construction activities.
K031	Construct lagoon for Kofa Sewage Lagoon Expansion.	Construction-related soil and vegetation disturbance at site (sewage lagoon 146,545 ft ²). Construction-related emissions.

^a Measurements are approximate.

^b Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.

TABLE 2-6
Proposed Action Activities Analyzed Programmatically—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Potential Principal Impacts ^{a, b}
K004-b	Install hard power/fiber and communication service at SWTR.	Construction-related soil and vegetation disturbance along utility lines (3,883 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
K005	Install hard power/fiber and communication service at Tower L.	Construction-related soil and vegetation disturbance along utility lines (450 ft ²). Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power.
K007-b	Install hard power/fiber and communication service west of S-15 Command and Control Shelter.	Construction-related soil and vegetation disturbance along utility lines (7,658 ft ²). Construction-related emissions. Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard

TABLE 2-6

Proposed Action Activities Analyzed Programmatically—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Potential Principal Impacts ^{a, b}
		power.
K009	Install fiber and permanent IVTS and telemetry relays at Windy Hill.	Construction-related soil and vegetation disturbance at site and associated utility lines (3,950 ft ²).
K012-b	Install hard power and communication service at GP 18.	Construction-related soil and vegetation disturbance along utility lines (530 ft ²). Construction-related emissions.
K021	Create LTA to support operational training and dismounted maneuver training at East Arm.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (28,233 ac). Minor impacts to Sonoran desert tortoise and habitat from creation and use of new or expanded testing and training areas. Disturbance would be episodic and may be separated widely in space or time. Note, additional NEPA analysis would be required prior to establishing bivouac areas.
K023	Install hard power and communication service to Hazard Classification Deflagration test area.	Construction-related soil and vegetation disturbance along utility lines 11,230 ft ² . Long-term reduction in fossil fuel use and air emissions from replacement of generators with hard power. Construction-related emissions.
K025	K025-a: Construct East Kofa Operations Center, including a small building complex, water well, septic system, perimeter fencing, vehicle maintenance area, storage areas, tactical vehicle wash rack, and 40-ton crane. K025-b: Install hard power and, communication service at East Kofa Operations Center.	Construction-related soil and vegetation disturbance (10 ac) and 1,370 ft ² for utilities.
K027	Create LTA to support operational testing and dismounted maneuver training at Tower 71.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (3,446 ac).
K028	Create LTA to support operational testing and dismounted maneuver training at SCAM Flats.	Vegetation and soil disturbance from dismounted maneuvers and bivouacs (12,660 ac).
K029	Extend water line from Counter-mine Test and Training Range to Building 3970 and Building 3971. Install fire suppression system in Building 3971.	Construction-related soil and vegetation disturbance (33,010 ft ²).

^a Measurements are approximate.

^b Measures to eliminate or reduce potential impacts are discussed in text under each resource, as appropriate.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Those that include a letter with the identifier are considered independent activities. Graphic representation on maps may be larger or smaller than the project area.

For the Proposed Action, the analysis is structured to allow the Army to exercise discretion and to select a subset of the proposed activities or, for certain activities, to select from among a range of magnitude, frequency, or duration. It also is possible that only a subset of the proposed activities described in Tables 2-1 through 2-3 would be selected for

implementation. The alternatives considered for implementation of the Proposed Action are discussed in Section 2.5.

2.5 Alternatives for Activities of the Proposed Action

In addition to the Proposed Action and the No Action Alternative, other alternatives were considered. For each component project, this section identifies whether one or more reasonable alternatives exist and provides descriptions of reasonable alternatives considered. In addition, for proposed projects with no reasonable alternatives, the justification for not retaining other alternatives is provided.

Reasonable alternatives to the proposed activities included in the Proposed Action that are subjected to detailed analysis are discussed in Tables 2-7 through 2-9 by region. Alternatives are not discussed for the proposed activities analyzed programmatically. The programmatic analysis documented in later sections was based on analysis of the likely maximum potential impacts of the considered activities on a broad scale. Because detailed analysis was not possible, due to the generally undefined nature of these activities, these activities would be analyzed in detail, including reasonable alternatives, in future follow-on, site-specific NEPA analysis that would tier from this programmatic analysis.

TABLE 2-7
Alternatives for Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
L001	L001-a: Construct building, concrete pad, shade structure, and solar lights at K-9 Village.	There are no reasonable alternatives to the proposed activity for L001-a because expansion of the existing K-9 Village facility, which provides a simulated urban environment for troop and K-9 unit training, would have less impact than construction of a new urban simulation facility elsewhere.
L002	L002-a: Construct Runway 18/36 extension, and realign Barranca Road at LAAF.	There are no reasonable alternatives to the proposed activity for L002-a because extension of the runway must be either to the north or south, along its long axis. Martinez Lake Road is a public road that crosses YPG to the north of the runway. Barranca Road is entirely within YPG to the south of the runway. Extension of the runway would require relocation of one of these roads. While there would be no difference in environmental impacts regardless of which direction the runway is extended, extension to the south would not affect public traffic or existing perimeter AT/FP setbacks.
L003	Construct outdoor eating area at the Roadrunner Café.	There are no reasonable alternatives to the proposed activity because the location of an outside eating area is constrained by the location of the existing facility.
L004	Construct office building next to Building 2968.	There are no reasonable alternatives to the proposed activity because potential locations are constrained by existing infrastructure, proximity to available parking, and other proposed construction.
L005	L005-a: Construct medium and large storage buildings next to Building 2970.	There are no reasonable alternatives to the proposed activity for L005-a because locations are constrained by existing infrastructure, proximity to users, and other proposed construction.
	L005-b: Construct 2 office buildings next to Building 2970.	There are no reasonable alternatives to the proposed activity for L005-b because locations are constrained by existing infrastructure, proximity to available parking, and

TABLE 2-7

Alternatives for Proposed Action Activities Analyzed in Detail– Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
		other proposed construction.
	L005-c: Construct Air Delivery Guided Test Facility next to Building 2970.	There are no reasonable alternatives to the proposed activity for L005-c because locations are constrained by existing infrastructure, proximity to related test facilities, and other proposed construction.
L006	L006-a: Construct Flight Detachment Maintenance Building.	There are no reasonable alternatives to the proposed activity for L006-a because the location is constrained by size requirements, existing infrastructure near the airfield, and other proposed construction.
	L006-b: Construct Wild Horse Café.	There are no reasonable alternatives to the proposed activity for L006-b because potential locations are constrained by existing infrastructure and other proposed construction.
	L006-c: Construct AT/FP parking improvements.	There are no reasonable alternatives to the proposed activity for L006-c because there are no choices for the location of the AT/FP parking improvements.
L007	L007-a: Construct helicopter parking at CDH.	There are no reasonable alternatives to the proposed activity for L007-a because locations at CDH are constrained by existing infrastructure, security setback requirements, and the proposed crosswind runway alignment.
	L007-b: Construct UAS parking, UAS storage facility, and UAS maintenance hangar at CDH.	There are no reasonable alternatives to the proposed activities for L007-b because locations at CDH are constrained by existing infrastructure, security setback requirements, and the proposed crosswind runway alignment. Impacts associated with construction of a new heliport and runway would be greater than those associated with upgrading facilities at CDH.
	L007-c: Construct privately owned vehicle (POV) parking at CDH.	There are no reasonable alternatives to the proposed activities for L007-c because locations at CDH are constrained by existing infrastructure, security setback requirements, and the proposed crosswind runway alignment. Impacts associated with construction of a new heliport and runway would be greater than those associated with upgrading facilities at CDH.
	L007-d: Relocate C-130 CALA to CDH.	There are no reasonable alternatives to the proposed activity for L007-d because locations at CDH are constrained by existing infrastructure, security setback requirements, and the proposed crosswind runway alignment.
L008	L008-a: Construct ACP at CDH.	There are no reasonable alternatives to the proposed activities for L008-a because there are no choices for the location of the security upgrades.
	L008-b: Construct roadway drainage improvements at CDH.	There are no reasonable alternatives to the proposed activity for L008-b because there are no choices for the location of the proposed improvements and because the site drainage improvements would have less environmental impact than a new access road to CDH.
L009	Construct warehouse at YTC.	There are no reasonable alternatives to the proposed activity for L009 because the location is constrained by existing infrastructure and proximity to related users.

TABLE 2-7

Alternatives for Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
L010	Construct Instrumentation Development Facility.	There are no reasonable alternatives to the proposed activity for L010 because the location is constrained by existing infrastructure, proximity to related test users, and other proposed construction.
L011	L011-a: Construct tracked vehicle trail at YTC.	There are no reasonable alternatives to the proposed activity for L011-a because potential routes from existing tracked vehicle trails to storage and maintenance areas are constrained by existing infrastructure and roadways and other proposed construction.
	L011-b: Construct office at YTC.	There are no reasonable alternatives to the proposed activity for L011-b because locations are constrained by existing infrastructure, other proposed construction, and proximity to existing parking.
L012	L012-a: Construct hotel at MAA.	There are no reasonable alternatives to the proposed activity for L012-a because sites within the MAA are constrained by existing infrastructure, proposed construction, and parcel size. No other available sites have sufficient size to accommodate the hotel.
	L012-b: Construct EOC at MAA.	There are no reasonable alternatives to the proposed activity for L012-b because sites within the MAA are constrained by existing infrastructure, proposed construction, and adjacency to roadways.
	L012-c: Construct addition to youth services center at MAA.	There are no reasonable alternatives to the proposed activity for L012-c because there are no choices for the location of the addition and because there would be less impact from expansion of the existing facility than from construction of a new youth services center.
	L012-d: Construct ACP improvements at MAA.	There are no reasonable alternatives to the proposed activity for L012-d because there are no choices for the location of the AT/FP improvements.
	L012-e: Construct child development center for school-aged services at MAA.	There are no reasonable alternatives to the proposed activity for L012-e because sites within the MAA are constrained by existing infrastructure, proposed construction, and adjacency to roadways.
	L012-f: Construct outdoor eating area at Coyote Lanes bowling alley.	There are no reasonable alternatives to the proposed activity because the location of an outside eating area is constrained by the location of the existing facility.
L013	L013-a: Construct additional fencing and support facilities at the Threat Systems and Target Simulations Buildings 3572 and 3574.	There are no reasonable alternatives to the proposed activity for L013-a because there are no choices for the location of security fencing and support facilities are constrained by existing infrastructure, other proposed construction, and parcel size.
L014	L014-a: Construct aircraft shelter, command and control building, and clear a UAS launch/recovery area at Comanche Flats.	There are no reasonable alternatives to the proposed activity for L014-a because the temporary construction-related impacts of expanding the testing and training capabilities at Comanche Flats would be less than those associated with establishing a new UAS testing/training area elsewhere on YPG. Relocation of the current and planned future activities from Comanche Flats to other existing UAS areas is not possible because other UAS areas are heavily utilized and cannot accommodate the additional testing and training conducted at Comanche Flats.

TABLE 2-7

Alternatives for Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
	L014-b: Construct multiple buildings, concrete pad, water tank, POL storage area, and graded parking area at Comanche Flats.	There are no reasonable alternatives to the proposed activity for L014-b because the temporary construction-related impacts of expanding the testing and training capabilities at Comanche Flats would be less than those associated with establishing a new UAS testing/training area elsewhere on YPG. Relocation of the current and planned future activities from Comanche Flats to other existing UAS areas is not possible because other UAS areas are heavily utilized and cannot accommodate the additional testing and training conducted at Comanche flats.
L015	L015-a: Repair landing pad and construct building at K-9 Village.	There are no reasonable alternatives to the proposed activity for L015-a because the temporary construction-related impacts of expanding the testing and training capabilities at K-9 Village would be less than those associated with establishing a new UAS testing/training area elsewhere on YPG. Relocation of the current and planned future activities from K-9 Village to other existing UAS areas is not possible because other UAS areas are heavily utilized and cannot accommodate the additional testing and training conducted at K-9 Village.
L016	L016-a: Construct building, concrete or asphalt pad, and shade structure, and install solar lights at Site 2.	There are no reasonable alternatives to the proposed activity because expansion of the existing Site 2 training area, which provides a simulated urban environment for troop and K-9 unit training, would have less impact than construction of a new urban simulation facility elsewhere.
L017	Construct GCSs for UAS operations at TM Site 4.	There are no reasonable alternatives to the proposed activity because enhancing this existing location to accommodate modified testing would have less impact than constructing a new test site at a different location. Relocation of the current and planned future activities from TM Site 4 to other existing UAS areas is not possible because other UAS areas are heavily utilized and cannot accommodate the additional testing and training conducted at TM Site 4.
L018	Construct concrete or asphalt pad and sensor tower east of existing sensor test building at Sidewinder Sensor Site.	There are no reasonable alternatives to the proposed activity because expansion of testing capabilities at the Sidewinder Sensor Site would have less impact than constructing a new sensor site elsewhere. Relocation of testing activities conducted at the Sidewinder Sensor Site is not possible because other sites lack the specific infrastructure to support testing at the Sidewinder Sensor Site and other sites are heavily used and cannot accommodate the additional testing and training conducted at the Sidewinder Sensor Site.
L019	Expand and combine West LA LTA, K-9 Village LTA, Site 2 LTA, and Site 4 LTA.	There are no reasonable alternatives to the proposed activity because this expansion would connect 4 MOUT areas (West LA, K-9 Village, Site 4, and Site 2) to allow overland navigation by military personnel to reach urban targets at different locations. No other locations on YPG are available that would allow use of existing urban simulation areas and the impacts associated with expanding these 4 existing LTAs would be less than establishing a new LTA and constructing multiple MOUT areas.

TABLE 2-7

Alternatives for Proposed Action Activities Analyzed in Detail– Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
		Multiple new or expanded LTAs are proposed in addition to L019. However, because of the existing MOUT areas in proximity to L019, the other proposed expanded or new LTAs are not considered reasonable alternatives for L019 due to the type of activities that would be conducted.
L020	Upgrade equipment at Tire X-Ray Facility (Building 2310).	There are no reasonable alternatives to the proposed activity because the upgrade of equipment is technically and economically feasible and there would be no environmental impacts from the equipment upgrade.
L021	Construct solar chamber at Climatic Simulation Facilities (Building 3527).	There are no reasonable alternatives to the proposed activity because the location is constrained by the size of the parcel required, other proposed construction, and proximity to related test facilities. Other locations of sufficient size would result in increased time, cost, and energy use to conduct climatic testing.
L022	Relocate dust chamber from Building 3352 to near Buildings 3357 and 3494 (Rough Handling).	There are no reasonable alternatives to the proposed activity because the location is constrained by the size of the parcel required, other proposed construction, and proximity to related test facilities.
L023	L023-a: Improve ACP at the Kofa cantonment.	There are no reasonable alternatives to the proposed activity for L023-a because there are no choices for the location of the ACP security upgrades.
	L023-b: Construct joint wash rack for tracked and GOVs at the Kofa cantonment.	There are no reasonable alternatives to the proposed activity for L023-b because the locations are constrained by parcel sizes, other proposed construction, and proximity to related test or maintenance facilities.
	L023-c: Construct electric substation protection and electronics expansion at the Kofa cantonment.	There are no reasonable alternatives to the proposed activity for L023-c because the locations are constrained by parcel sizes, other proposed construction, and proximity to related test or maintenance facilities.
	L023-d: Construct Howitzer Support/Acceptance Facility at the Kofa cantonment.	There are no reasonable alternatives to the proposed activity because the location is constrained by the size of the parcel required, other proposed construction, and proximity to KFR. Other locations of sufficient size would result in increased time, cost, and energy use to move from storage to firing positions.
	L023-e: Construct open storage facility at the Kofa cantonment.	There are no reasonable alternatives to the proposed activity for L023-e because the locations are constrained by parcel sizes, other proposed construction, and the need to have proximity to related test or maintenance facilities.
L024	Relocate Semi-trailer Delivery Safe Haven.	There are no reasonable alternatives to the proposed activity because the location is constrained by the need for access to US 95 and by the need to meet safety/security requirements.
L025	L025-a: Construct Aberdeen Road flood upgrades.	There are no reasonable alternatives for L025-a because there are no choices for the location of the improvements. There is no way to access the Kofa cantonment without crossing Castle Dome Wash. Construction of a new road, with an associated new crossing of Castle Dome Wash, would have greater impacts than upgrading the existing crossing of the wash.
	L025-b: Construct range road	There are no reasonable alternatives to the proposed

TABLE 2-7

Alternatives for Proposed Action Activities Analyzed in Detail—Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
	improvements.	activity for L025-b because construction of new roads would have greater impacts than upgrading existing roads and there are no alternate choices for locations where problems with roads occur and where upgrades would be implemented.
L026	Construct munitions treatment facility.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirements of the YPG Resource Conservation and Recovery Act (RCRA) Part B Permit.
L027	Construct gun storage facility at the Kofa cantonment.	There are no reasonable alternatives to the proposed activity because the location is constrained by the size of the parcel required, other proposed construction, and proximity to KFR. Other locations of sufficient size would result in increased time, cost, and energy use to move from storage to firing positions.
L028	Construct 5 ammunition magazines near the Kofa cantonment.	There are no reasonable alternatives to the proposed activity because locations are constrained by the need to have proximity to delivery access points, other construction, and requirements for explosive quantity safety distance (EQSD) arcs.
L029	Construct optical maintenance facility, graded parking area, and fencing.	There are no reasonable alternatives to the proposed activity because potential locations are constrained by existing infrastructure, the need to have proximity to related test users and available parking, and other proposed construction.
L030	L030: Expand LTA to support operational testing and dismounted maneuvers at Muggins/Middle East (only one would be selected): L030-a: 16,640 ac L030-b: 6,331 ac	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C063, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected. Expansion of an existing LTA would have less impact than creation of a new LTA elsewhere. There are two reasonable alternatives for L030 and both were considered. L030-b is the Preferred Alternative.
L031	L031: Construct MFFS DFAC (only one option to be selected): L031-a: at Location Option 1 L031-b: at Location Option 2 L031-c: at Location Option 3	Three reasonable alternative locations for this activity are under consideration (L031-a, L031-b, L031-c) and only one would be selected if the activity is implemented. Other potential locations for the DFAC are constrained by other existing and proposed uses at YPG. The Preferred Alternative is Option 1.
L032	Expand Bravo LTA.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects, L030, L032, L033, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected. Expansion of an existing LTA would have less impact than creation of a new LTA elsewhere.
L033	Expand Hill 630 LTA.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C060, C064, K021, K026, K027,

TABLE 2-7

Alternatives for Proposed Action Activities Analyzed in Detail– Laguna Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
		K028). Some, all, or none of these proposed LTAs may be selected. Expansion of an existing LTA would have less impact than creation of a new LTA elsewhere.
L034	L034: Construct MFFS Ready Room (only one option to be selected): L034-a: at Location Option 1 L034-b: at Location Option 2 L034-b: at Location Option 3	Three reasonable alternative locations for this activity are under consideration (L034-a, L034-b, L034-c) and only one would be selected if the activity is implemented. Other potential locations for the Ready Room are constrained by other existing and proposed uses. The Preferred Alternative is Option 1.
L035	Construct Armament Test Operations and Analysis Facility.	There are no reasonable alternatives to the proposed activity because potential locations for this facility are constrained by existing infrastructure, the need for proximity to related test users and available parking, and other proposed construction.
L036	Construct Shower Facility at LAAF FOB area.	There are no reasonable alternatives to the proposed activity because showers are needed to support training exercises at the LAAF FOB and because existing temporary facilities have exceeded their functional life and replacement with other temporary facilities is not cost-effective.
L037	Construct vehicle test course and establish LTA for dismounted maneuvers and blended training.	There are no reasonable alternatives to the proposed activity because other locations are constrained by existing and proposed uses and by the need to have proximity to roads for vehicle access.
L038	Construct vehicle test course and establish LTA for dismounted maneuvers and blended training.	There are no reasonable alternatives to the proposed activity because other locations are constrained by existing and proposed uses and by the need to have proximity to roads for vehicle access.
L039	Construct vehicle test course and establish LTA for dismounted maneuvers and blended training.	There are no reasonable alternatives to the proposed activity because other locations are constrained by existing and proposed uses and by the need to have proximity to roads for vehicle access.
L040	Construct DZ near LAAF (984-ft x 1,969-ft).	There are no reasonable alternatives to the proposed activities because other locations are constrained by airspace restrictions, the presence of unexploded ordnance (UXO), and the need to have road accessibility by transport/recovery vehicles.
L041	Construct air delivery storage and laboratory facility behind Building 2970.	There are no reasonable alternatives to the proposed activity because other locations are constrained by existing infrastructure, the need to have proximity to related test users and available parking, and other proposed construction.
L042	Upgrade facility to an office and hangar in Building 3025.	There are no reasonable alternatives to the proposed activity because upgrade of an existing facility is less intrusive than development of a new facility and because of the proximity to related test facilities.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Graphic representation on maps may be larger or smaller than the project area.

TABLE 2-8

Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
C001	Construct vehicle test course.	There are no reasonable alternatives to the proposed activity because other locations for the vehicle test course are constrained by other existing and proposed uses and by the need to have proximity to roads for vehicle access.
C002	C002-a: Construct South Urban DZ (1,640-ft radius) south of Urban DZ.	There are no reasonable alternatives to the proposed activities because other locations are constrained by airspace restrictions, the presence of UXO, and the need to have road accessibility by transport/recovery vehicles (Jason Associates Corporation, 2001).
	C002-b: Construct Tomahawk Circular DZ 769 (2,297-ft radius).	There are no reasonable alternatives to the proposed activities because other locations are constrained by airspace restrictions, the presence of UXO, and the need to have road accessibility by transport/recovery vehicles (Jason Associates Corporation, 2001). The location for C002-b is further constrained by a requirement to be in mountainous terrain to meet testing requirements.
	C002-c: Construct Tombstone DZ (984-ft radius).	There are no reasonable alternatives to the proposed activities because other locations are constrained by airspace restrictions, the presence of UXO, and the need to have road accessibility by transport/recovery vehicles (Jason Associates Corporation, 2001).
	C002-d: Construct Village Circular DZ (984-ft radius).	There are no reasonable alternatives to the proposed activities because locations are constrained by airspace restrictions, the presence of UXO, and the need to have road accessibility by transport/recovery vehicles (Jason Associates Corporation, 2001).
	C002-e: Construct Abken DZ (1,640-ft radius).	There are no reasonable alternatives to the proposed activities because locations are constrained by airspace restrictions, the presence of UXO, and the need to have road accessibility by transport/recovery vehicles (Jason Associates Corporation, 2001).
	C002-f: Construct Urban Circular JPADS DZ (984-ft radius).	There are no reasonable alternatives to the proposed activities because locations are constrained by airspace restrictions, the presence of UXO, and the need to have road accessibility by transport/recovery vehicles (Jason Associates Corporation, 2001).
C003	C003-a: Establish small arms impact areas for inert munitions at JERC I. Small arms impact areas would use collection boxes for fired ammunition and would be cleaned between tests.	There are no reasonable alternatives C003-a because the location is constrained by the requirement to support ongoing testing at JERC I. Construction of a new facility to provide the testing conducted at JERC I at an existing small arms impact areas would have greater impacts than establishing a small arms impact area at JERC I. Relocation of testing and training activities conducted at JERC I is not possible because other sites lack the specific infrastructure to support the testing and training conducted at these sites and because other sites are heavily used and cannot accommodate the additional testing and training conducted at JERC I.

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
	C003-b: Establish small arms impact areas for inert munitions at JERC II. Small arms impact areas would use collection boxes for fired ammunition and would be cleaned between tests.	<p>There are no reasonable alternatives C003-b because the location is constrained by the requirement to support ongoing testing at JERC II. Construction of a new facility to provide the testing conducted at JERC II at an existing small arms impact area would have greater impacts than establishing a small arms impact area at JERC II.</p> <p>Relocation of testing and training activities conducted at JERC II is not possible because other sites lack the specific infrastructure to support the testing and training conducted at these sites and because other sites are heavily used and cannot accommodate the additional testing and training conducted at JERC II.</p>
	C003-c: Establish small arms impact areas for inert munitions at JERC III. Small arms impact areas would use collection boxes for fired ammunition and would be cleaned between tests.	<p>There are no reasonable alternatives C003-c because the location is constrained by requirement to support ongoing testing at JERC III. Construction of a new facility to provide the testing conducted at JERC III at an existing small arms impact area would have greater impacts than establishing a small arms impact area at JERC III.</p> <p>Relocation of testing and training activities conducted at JERC III is not possible because other sites lack the specific infrastructure to support the testing and training conducted at these sites and because other sites are heavily used and cannot accommodate the additional testing and training conducted at JERC III.</p>
C004	C004-a: Construct facilities at Gauna Peak.	<p>There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support ongoing testing and training at Gauna Peak.</p> <p>Relocation of testing and training activities conducted at Gauna Peak is not possible because other sites are heavily used and cannot accommodate the additional testing and training conducted at Gauna Peak.</p>
C005	C005-a: Construct building at Site 18.	<p>There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support ongoing testing and training at Site 18.</p> <p>Relocation of testing and training activities conducted at Site 18 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at Site 18 and because other sites are heavily used and cannot accommodate the additional testing and training conducted at Site 18.</p>
C006	Establish Phoenix West Impact Area.	<p>There are no reasonable alternatives to the proposed activity because the location is constrained by airspace restrictions, the need to have accessibility by transport/recovery vehicles, and minimum separation distance requirements from areas where strong EM signals are used.</p>

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier^a	Proposed Activities	Alternatives
C007	C007-a: Construct runway extension, aircraft shelter, and POL storage at Phoenix UAS site.	<p>There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support ongoing testing and training at Phoenix UAS site.</p> <p>Relocation of testing and training activities conducted at the Phoenix UAS site is not possible because other sites lack the specific infrastructure to support the testing and training conducted at the Phoenix UAS site and because other sites are heavily used and cannot accommodate the additional testing and training conducted at the Phoenix UAS site.</p>
C008	C008-a: Construct building at Site 16.	<p>There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support ongoing testing and training at Site 16.</p> <p>Relocation of testing and training activities conducted at Site 16 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at Site 16 and because other sites are heavily used and cannot accommodate the additional testing and training conducted at Site 16.</p>
C009	Establish North UAS Impact Area.	<p>There are no reasonable alternatives to the proposed activity because locations for impact areas associated with UAS testing are constrained by airspace restrictions, the need to have accessibility by transport/recovery vehicles, and minimum separation distances from other test areas where strong EM signals are used.</p>
C010	Construct aircraft shelter, POL storage, and graded parking lot at North UAV Complex.	<p>There are no reasonable alternatives to the proposed activities the location is constrained by the requirement to support testing and training at the North UAV Complex.</p> <p>Relocation of testing and training activities conducted at the North UAV Complex is not possible because other sites lack the specific infrastructure to support the testing and training conducted at the North UAV Complex and because other sites are heavily used and cannot accommodate the additional testing and training conducted at the North UAV Complex.</p>
C011	Establish La Posa West Impact Area.	<p>There are no reasonable alternatives to the proposed activity because locations for impact areas associated with UAS testing are constrained by airspace restrictions, the need to have accessibility by transport/recovery vehicles, and minimum separation distances from other test areas where strong EM signals are used.</p>
C012	C012-a: Construct building and concrete pad at PSS Test Area (west of La Posa DZ).	<p>There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at the PSS Test Area.</p> <p>Relocation of the testing and training conducted at the PSS Test Area is not possible due to requirements for minimal EM interference and because other sites are heavily used and cannot accommodate the additional</p>

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
		testing and training conducted at the PSS Test Area.
C014	C014-a: Install shade structure at Stinger Pole Target Area.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at the Stinger Pole Target Area. Relocation of the testing and training conducted at the Stinger Pole Target Area is not possible because other sites lack the specific infrastructure to support the testing and training conducted at the Stinger Pole Target Area and because other sites are heavily used and cannot accommodate the additional testing and training conducted at the Stinger Pole Target Area.
C015	Construct ISR/EO Ground Truth Reference Sites at: C015-a: Yuma Wash (33.156, -114.485) C015-b: Middle Mountain Road (33.063, -114.358) C015-c: Mule Wash (33.432, -114.503) C015-d: (33.446, -114.471) C015-e: (33.477, -114.286) C015-f: (33.444, -114.325) C015-g: (33.448, -114.275) C015-h: (33.421, -114.279) C015-i: (33.408, -114.360) C015-j: (33.389, -114.303) C015-k: (33.387, -114.366) C015-l: (33.347, -114.286) C015-m: (33.297, -114.395) C015-n: (33.165, -114.480) C015-o: (33.122, -114.299) C015-p: (33.090, -114.447) C015-q: (33.081, -114.353) C015-r: (33.967, -114.422)	There are no reasonable alternatives to the proposed activity because these sites are consolidated sensor arrays deployed to optimally provide ground truth verification for aerial activities and the ability of airborne sensors to perceive the ground truth sites. These arrays are deployed in locations with other compatible land uses.
C016	Rebuild target for long-range missile firing at Maverick Target.	There are no reasonable alternatives to the proposed activity because this specific target in an existing impact area needs to be rebuilt.
C017	C017-a: Construct building, bomb-proof shelter, shade structure, concrete or asphalt pad, and sensor tower at CM 4.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at CM 4. Relocation of the testing and training conducted at CM 4 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at CM 4 and because other sites are heavily used and cannot accommodate the additional testing and training conducted at CM 4.
C018	Construct landing pad at CM 1.	There are no reasonable alternatives to the proposed activities because the location for the landing pad is constrained by existing roadways, infrastructure, and site topography at CM 1.
C019	Construct building and concrete pad at Z-12.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at Z-12. The locations for the building and pad are constrained by roadways, infrastructure, and site topography.

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
C020	C020-a: Construct sensor tower, buildings, and concrete pad at Site 9.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at Site 9 and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at Site 9 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at Site 9 and because other sites are heavily used and cannot accommodate the additional testing and training conducted at Site 9.
C021	C021-a: Construct secure building with reinforced concrete floors and ramp to building centered at (-114.356, 33.077).	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at this location. The location for the building is constrained by the locations of infrastructure, roadways, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C021-b: Construct multiple buildings, water tank, POL storage area and graded parking area centered at (-114.356, 33.077).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C021-c: Construct aircraft shelter centered at (-114.356, 33.077).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C021-d: Clear a launch/recovery area centered at (-114.356, 33.077).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
C022	C022-a: Construct building, concrete slab, walkways, and fencing centered at (-114.36, 33.074).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C022-b: Construct aircraft shelter centered at (-114.36, 33.074).	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C022-c: Construct POL storage centered at (-114.36, 33.074).	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C022-d: Relocate meteorological tower centered at (-114.36, 33.074).	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C022-e: Construct runway expansion and taxiway centered at (-114.36, 33.074).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
		testing and training conducted at this location.
C023	C023-a: Construct multiple buildings, water tank, POL storage area, and graded parking centered at (-114.363, 33.051).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C023-b: Construct aircraft shelter centered at (-114.363, 33.051).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
	C023-c: Clear a launch/recovery area centered at (-114.363, 33.051).	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at this location and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at this location is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at this location.
C024	C024-a: Construct aircraft shelter, concrete pad, graded parking area near IRCC Tank Maintenance and Storage Ramada.	There are no reasonable alternatives to the proposed activities for C024-a because the location is constrained by the locations of existing munitions impact areas, DZs, and infrastructure and is further constrained by proximity to roadways for access/ recovery.
	C024-b: Fence and install solar lights, around IRCC Tank Maintenance and Storage Ramada.	There are no reasonable alternatives to the proposed activities for C024-b because there are no choices for the location of these security features.
C025	C025-a: Construct runway, taxiway, aircraft shelter, and building at IRCC.	There are no reasonable alternatives to the proposed activities because the location is constrained by the location of the helipad, other infrastructure, and existing roadways.
C026	C026-a: Construct ramp to existing building and rollup door to existing building and install solar lights at Site 10 Missile Test Facility.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at the Site 10 Missile Test Facility and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at the Site 10 Missile Test Facility is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
		accommodate the additional testing and training conducted at Site 10 Missile Test Facility.
	C026-b: Construct concrete landing pad at Site 10 Missile Test Facility.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at the Site 10 Missile Test Facility and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at Site 10 Missile Test Facility is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at the Site 10 Missile Test Facility.
C027	C027-a: Expand flat area on top of hill, and construct facility, concrete pad, and sensor tower at Site 12.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at Site 12 and by the locations of existing roadways, other infrastructure, and site topography. The location for hard power is constrained by the location of existing infrastructure and roadways. Relocation of the testing and training conducted at Site 12 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at Site 12.
	C027-b: Construct road leading from the sensor building on the top of the hill at Site 12A down to the PTDS Site.	There are no reasonable alternatives to the proposed activity because the location of the road is constrained by the location of infrastructure and site topography.
C029	C029-a: Construct buildings, concrete pad, and install generators at Aerostat Mooring Site.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support ongoing activities at the Aerostat Mooring Site and by the locations of existing roadways, other infrastructure, and site topography.
C030	C030-a: Construct aircraft shelter, multiple buildings, water tank, POL storage, graded parking, and clear launch/recovery area east of Rocket Alley.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support UAS testing and training near and adjacent to Rocket Alley and by the locations of existing roadways, other infrastructure, and site topography.
C031	Utilize Site 6 as a meteorological station.	There are no reasonable alternatives to the proposed activity because there would be no environmental impacts associated with the reuse of a previously disturbed site in this non-intrusive manner.
C032	Renovate Large Multi-Purpose Environmental Chamber (Building 6015).	There are no reasonable alternatives to the proposed activity because renovation is technically and economically feasible and no environmental impacts would be associated with this activity.

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
C033	C033-a: Construct aircraft shelter, multiple buildings, concrete pad, water tank, POL storage area, graded parking area, and clear a launch/recovery area at C-17.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at C-17 and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at C-17 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at C-17 and because other sites are heavily used and cannot accommodate the additional testing and training conducted at C-17.
C034	C034-a: Expand size of Graze Range Impact Areas by consolidating 7 individual impact areas into a single larger area	There are no reasonable alternatives to the proposed activity because expansion of the Graze Range Impact Areas by consolidation of smaller individual impact areas would have less impact than establishment of a new firing range of this size in another location. There were alternatives with regard to the size of the consolidated impact area. The Preferred Alternative is to implement a 626-ac consolidation, 15 ac less than originally proposed.
C035	Expand Combined Live Fire Exercise Range at OP-9 by consolidating 2 designated impact areas and Prospect Square.	There are no reasonable alternatives to the proposed activity because expansion of the existing Live Fire Exercise Range impact areas by consolidation across the existing space between the ranges and connecting with Prospect Square would have less impact than establishment of a new firing range of this size in another location.
C036	Increase use of Prospect Square for bombing or aircraft gunnery.	There are no reasonable alternatives to the proposed activity because Prospect Square is already committed to this use and can accommodate additional bombing and gunnery activities. Additional use of this area would have less environmental impact than constructing a new bombing/aircraft gunnery area elsewhere.
C037	Install hard power and cameras to 40-ft drop tower.	There are no reasonable alternatives to the proposed activity because the location is constrained by existing infrastructure and roadways.
C038	Construct MEDEVAC pad at CDA.	There are no reasonable alternatives to the proposed activity because locations for MEDEVAC helicopter landing pads are constrained by locations of testing and training sites in remote areas, which lack roadways capable of accommodating emergency medical vehicles for rapid response and/or evacuation.
C039	Construct air-conditioned storage facility at CDA.	There are no reasonable alternatives to the proposed activity because the location is constrained by proximity to occupied buildings and existing testing/training activities.
C041	Expand LTA to support operational testing and dismounted maneuver training at Middle Mountain.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C060, C064, K021, K026, K0-27, K028). Some, all, or none of these

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
		proposed LTAs may be selected. Expansion of an existing LTA would have less impact than creation of a new LTA elsewhere.
C043 Locations for temporary burials would vary and be determined by specific testing requirements.	C043-a: Temporarily bury simulated missiles, explosives, etc. off JERC I roads for sensor testing.	There are no reasonable alternatives to the proposed activity because locations are constrained by the requirement to support ongoing testing at JERC I, and are further constrained by the locations of the existing road system and infrastructure in the JERC sites.
	C043-b: Temporarily bury simulated missiles, explosives, etc. off JERC II roads for sensor testing.	There are no reasonable alternatives to the proposed activity because locations are constrained by the requirement to support ongoing testing at JERC II, and are further constrained by the locations of the existing road system and infrastructure in the JERC sites.
	C043-c: Temporarily bury simulated missiles, explosives, etc. off JERC III roads for sensor testing.	There are no reasonable alternatives to the proposed activity because locations are constrained by the requirement to support ongoing testing at JERC III, and are further constrained by the locations of the existing road system and infrastructure in the JERC sites.
C044	C044-a: Clear MEDEVAC helicopter landing pads at JERC I for evacuations.	There are no reasonable alternatives to the proposed activities because locations for MEDEVAC helicopter landing pads are constrained by locations of testing and training sites in remote areas that lack roadways capable of accommodating emergency medical vehicles for rapid response and/or evacuation.
	C044-b: Clear MEDEVAC helicopter landing pads at JERC II for evacuations.	There are no reasonable alternatives to the proposed activities because locations for MEDEVAC helicopter landing pads are constrained by locations of testing and training sites in remote areas that lack roadways capable of accommodating emergency medical vehicles for rapid response and/or evacuation.
	C044-c: Clear MEDEVAC helicopter landing pads at JERC III for evacuations.	There are no reasonable alternatives to the proposed activities because locations for MEDEVAC helicopter landing pads are constrained by locations of testing and training sites in remote areas that lack roadways capable of accommodating emergency medical vehicles for rapid response and/or evacuation.
C046	North UAV Compound Expansion: C046-a: Construct concrete pad.	There are no reasonable alternatives to the proposed activity because the location is constrained by the locations of existing infrastructure, roadways, and existing training/testing activities.
	C046-b: Grade project area and install fencing.	There are no reasonable alternatives to the proposed activity because the location is constrained by the locations of existing infrastructure, roadways, and existing training/testing activities.
	C046-c: Construct asphalt taxiway.	There are no reasonable alternatives to the proposed activity because the location is constrained by the locations of existing infrastructure, roadways, and existing training/testing activities.
C047	Create 23 TGPs at: C047-a: Rocket Alley C047-b: CM 9 East C047-c: Cibola Target Boundary GP C047-d: Site 16	There are no reasonable alternatives to the proposed activities. Locations for proposed TGPs were selected based on the requirement to support testing and training activities in nearby munitions impact areas. Locations were further constrained by proximity to existing roads and existing topography that would allow firing into

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier^a	Proposed Activities	Alternatives
	C047-e: CM 9 West C047-f: C17 (North and South) C047-g: Mound C Archer GP C047-h: Mound C GP C047-i: CM 1 West C047-j: La Posa DZ C047-k: Site 8 GP C047-l: West Target Road GP C047-m: BM1072 C047-n: Excalibur SW GP C047-o: LADZ GP C047-p: Site 18 GP C047-q: 2.75 Rocket GP C047-r: Ehrenberg GP C047-s: DFR GP C047-t: La Posa South DZ C047-u: Water Tank GP C047-v: LA DZ East C047-w: C17 North M777LWH GP.	existing munitions impact areas.
C049	Install acoustic and seismic sensor at the Horizontal Impact Area.	There are no reasonable alternatives to the proposed activity because the location is constrained by existing testing requirements.
C050	C050-a: Construct building and UAS launch/recovery site at the Simulated Minefield Site to support UAS operations.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support UAS testing and training at the Simulated Minefield Site and by the locations of existing roadways, other infrastructure, and site topography. Relocation of the testing and training conducted at the Simulated Minefield Site is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location and because other sites are heavily used and cannot accommodate the additional testing and training conducted at the Simulated Minefield Site.
C051	Install shade structure at Lightweight Shock Facility.	There are no reasonable alternatives to the proposed activity because the location is constrained by existing testing requirements and there would be no environmental impacts associated with this activity.
C052	Establish CM 7 Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C053	Establish CM 4 North Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C054	Construct Yuma Wash ECUT expansion.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support ECUT testing and training at the Yuma Wash ECUT Site. Relocation of the testing and training conducted at the Yuma Wash ECUT Site is not possible because other sites lack the specific infrastructure to support the testing and training conducted at this location, including ECMD testing, and because other sites are heavily used

TABLE 2-8
Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
		and cannot accommodate the additional testing and training conducted at the Yuma Wash ECUT Site.
C055	Establish Multi-Purpose North Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C056	Establish Multi-Purpose South Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C057	Expand Rocket Alley Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C058	Establish Aerial Weapons Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C059	Establish East Target Road Impact Area.	There are no reasonable alternatives to the proposed activity because locations for new munitions impact areas are constrained by airspace restrictions and land use by other testing activities.
C060	Create LTA to support operational testing and dismounted maneuver training at TOW Town.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected.
C061	Create LTA to support operational testing and dismounted maneuver training at JERC I/Saderville.	Multiple new or expanded LTAs are proposed in addition to C061. However, because of this LTA would specifically support testing conducted at JERC I/ Saderville, the other proposed expanded or new LTAs are not considered reasonable alternatives for C061.
C062	Create LTA to support operational testing and dismounted maneuver training at JERC II.	Multiple new or expanded LTAs are proposed in addition to C062. However, because of this LTA would specifically support testing conducted at JERC II, the other proposed expanded or new LTAs are not considered reasonable alternatives for C062.
C063	Create LTA to support operational testing and dismounted maneuver training at JERC III.	Multiple new or expanded LTAs are proposed in addition to C063. However, because of this LTA would specifically support testing conducted at JERC III, the other proposed expanded or new LTAs are not considered reasonable alternatives for C063.
C064	Create LTA to support operational testing and dismounted maneuver training at Yuma Wash.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected.

TABLE 2-8
 Alternatives for Short-term Proposed Action Activities—Cibola Region
Yuma Proving Ground

Identifier ^a	Proposed Activities	Alternatives
C065	C065: Create LRA Impact Areas: C065-a: LRA Impact Area 1	Potential locations for LRAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. Four potential sites for new LRAs are evaluated. All, some, or none these potential sites may be selected.
	C065-b: LRA Impact Area 2	Potential locations for LRAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. Four potential sites for new LRAs are evaluated. All, some, or none of these potential sites may be selected.
	C065-c: LRA Impact Area 3	Potential locations for LRAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. Four potential sites for new LRAs are evaluated. All, some, or none of these potential sites may be selected.
	C065-d: LRA Impact Area 4	Potential locations for LRAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. Four potential sites for new LRAs are evaluated. All, some, or none of these potential sites may be selected.
C066	C066-a: Construct aerial cable drop site for drop testing in mountains north of Prospect Square. Activity includes two cables suspended between mountain peaks, winches and pulleys for each cable, and 328-ft target area.	Potential locations for aerial cable drop sites are constrained by the need for topography that allows construction of a cable of sufficient height to conduct the needed tests. There is a reasonable alternative to project C066 that is considered as project K024, which is the Preferred Alternative.
	C066-b: Construct an approximately 2.5-mile access trail to the target area	The location of the road is constrained by potential locations for aerial cable drop sites and existing infrastructure and roadways. There is a reasonable alternative to project C066 that is considered as project K024, which is the Preferred Alternative.

^a The project originally proposed as C028 has been removed from direct analysis in this document. Due to a time critical need for implementation, this activity was analyzed through a separate and specific NEPA document. This activity is considered in the analysis of cumulative impacts in this document.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Graphic representation on maps may be larger or smaller than the project area.

TABLE 2-9
 Alternatives for Short-term Proposed Action Activities—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
K001	Construct 1,640-ft radius DZ for personnel and cargo drops in the southern portion of East Arm.	There are no reasonable alternatives to the proposed activity because DZ locations on YPG are constrained by airspace restrictions, the presence of UXO, and road access (Jason Associates Corporation, 2001).

TABLE 2-9
Alternatives for Short-term Proposed Action Activities—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
K002	Construct a 1,250-ft radius DZ for personnel and cargo drops northeast of East SWTR Impact Area.	There are no reasonable alternatives to the proposed activity because DZ locations on YPG are constrained by airspace restrictions, the presence of UXO, and road access (Jason Associates Corporation, 2001).
K003	Expand munitions impact area from north boundary of Echo and Foxtrot to north boundary of contaminated area (Advanced Munitions Range).	There are no reasonable alternatives to the proposed location because the expansion must occur at this location. The analysis considered variations in the size of the expanded munitions impact area: a minimum area expansion alternative, a maximum area expansion alternative to include all of the available space, and an intermediate area expansion alternative. The Preferred Alternative is to expand the munitions impact area by 2,932 ac less than originally proposed.
K004	K004-a: Construct aircraft shelter, multiple buildings, water tank, POL storage area, and graded parking area, and clear a launch/recovery area at SWTR	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at SWTR and is further constrained by topography and by the locations of existing roadways and other infrastructure. Relocation of the testing and training conducted at SWTR is not possible because other sites lack the specific infrastructure to support the testing and training conducted at SWTR and because other sites are heavily used and cannot accommodate the additional testing and training conducted at SWTR.
K006	Install launch/recovery systems and a GCS trailer at Tower 48.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at Tower 48 and is further constrained by topography and by the locations of existing roadways and other infrastructure. The location for hard power is constrained by the location of existing infrastructure and roadways. Relocation of the testing and training conducted at Tower 48 is not possible because other sites lack the specific infrastructure to support the testing and training conducted at Tower 48 and because other sites are heavily used and cannot accommodate the additional testing and training conducted at Tower 48.
K007	K007-a: Construct runway west of S-15 Command and Control Shelter.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at the S-15 Command and Control Shelter, topography, the proximity to live-fire ranges, and by the locations of existing roadways and other infrastructure.
K008	Expand munitions impact area to encompass area between Impact Areas Delta and Echo.	There are no reasonable alternatives to the proposed location because the expansion must occur at this location. The analysis will consider variations in the size of the expanded munitions impact area: a minimum area expansion alternative (4,500 ac) and a maximum area expansion alternative (16,000 ac).

TABLE 2-9
Alternatives for Short-term Proposed Action Activities—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
K009	Install fiber and permanent IVTS and telemetry relays at Windy Hill.	There are no reasonable alternatives to the proposed activities because the location is constrained by topography, which necessitates placing IVTS and telemetry relays on the summit of Windy Hill. The location of fiber is constrained by the location of roadways to the top of Windy Hill.
K010	Expand munitions impact area north of North Boundary Road between GP 21A and Impact Area Alpha (Advanced Munitions Range).	There are no reasonable alternatives to the proposed location because locations for munitions impact areas are constrained by airspace restrictions and land use by other testing activities. The impacts associated with expanding this existing munitions impact area would be less than those of establishing a new munitions impact area.
K011	Renovate site and construct new control room and firing chamber at GP 5.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at GP 5, by safety requirements, and by the locations of existing roadways and other infrastructure.
K012	K012-a: Construct two permanent reinforced concrete buildings to house personnel, equipment, and ammunition, and new access road at GP 18.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at GP 18, by safety requirements, and by the locations of existing roadways and other infrastructure.
K013	Construct permanent reinforced concrete building and additional building to house weapons at GP 21.	There are no reasonable alternatives to the proposed activities because the location is constrained by the requirement to support testing and training at GP 21, by safety requirements, and by the locations of existing roadways and other infrastructure.
K014	Construct ISR/EO Ground Truth Reference Sites at: K014-a: (32.846, -114.336) K014-b: (32.967, -114.239) K014-c: (32.932, -114.151) K014-d: (32.822, -114.196) K014-e: (32.990, -113.955) K014-f: (32.930, -113.926) K014-g: (32.836, -114.016) K014-h: (32.867, -113.922) K014-i: (32.841, -113.866) K014-j: (32.986, -113.812) K014-k: (32.904, -113.791) K014-l: (32.020, -113.758) K014-m: (32.957, -113.666)	There are no reasonable alternatives to the proposed activity because these sites are consolidated sensor arrays deployed to optimally provide ground truth verification for aerial activities and the ability of airborne sensors to perceive the ground truth sites. These arrays are deployed in locations with other compatible land uses.
K015	Construct permanent building at North Boundary GP.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at North Boundary GP, by safety requirements, and by the locations of existing roadways and other infrastructure.
K016	Construct permanent building at GP 17A.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at GP 17A, by safety requirements, and by the locations of existing roadways and

TABLE 2-9
Alternatives for Short-term Proposed Action Activities—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
		other infrastructure.
K017	Construct permanent building at GP on Growl Road in southeast corner of Echo Munitions Impact Area.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at GP QQ, by safety requirements, and by the locations of existing roadways and other infrastructure.
K018	Construct permanent reinforced concrete building at GP Splinter.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at GP Splinter, by safety requirements, and by the locations of existing roadways and other infrastructure.
K019	Construct permanent reinforced concrete building at GP 19.1.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at GP 19.1, by safety requirements, and by the locations of existing roadways and other infrastructure.
K020	Construct permanent reinforced concrete building at GP 11.1.	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support testing and training at GP 11.1, by safety requirements, and by the locations of existing roadways and other infrastructure.
K021	Create LTA to support operational testing and dismounted maneuver training at East Arm.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected.
K024	K024-a: Construct aerial cable drop site for drop testing in mountains south of Pole Line Road. Activity includes two cables suspended between mountain peaks, winches and pulleys for each cable, and 328-ft target area.	Potential locations for aerial cable drop sites are constrained by topography that allows construction of a cable of sufficient height to conduct the needed tests. There is a reasonable alternative to project K024 that is considered as project C066; however, K024 is the Preferred Alternative.
	K024-b: Construct an approximately 0.6-mile access trail to the target area	The location of the road is constrained by potential locations for aerial cable drop sites and existing infrastructure and roadways. There is a reasonable alternative to project K024 that is considered as project C066; however, K024 is the Preferred Alternative.
K026	Expand LTA to support operational testing and dismounted maneuver training at SWTR.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need for proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected. The impacts associated with expansion of an existing LTA would be less those of creating a new LTA elsewhere. The Preferred Alternative would expand the LTA by 1,826 ac less than originally proposed.

TABLE 2-9
Alternatives for Short-term Proposed Action Activities—Kofa Region
Yuma Proving Ground

Identifier	Proposed Activities	Alternatives
K027	Create LTA to support operational testing and dismounted maneuver training at Tower 71.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected.
K028	Create LTA to support operational testing and dismounted maneuver training at SCAM Flats.	Potential locations for LTAs are constrained by other existing and proposed uses and by the need to have proximity to roads for troop access. All potential sites for new or expanded LTAs are evaluated (includes projects L030, L032, L033, C041, C060, C064, K021, K026, K027, K028). Some, all, or none of these proposed LTAs may be selected.
K029	Extend water line from Counter-mine Test and Training Range to Building 3970 and Building 3971. Install fire suppression system in Building 3971.	There are no reasonable alternatives for the proposed activities. Extension from the Counter-mine Test and Training Range would have the minimum length of pipe and minimum disturbance.
K030	Construct runway, taxiway, aircraft shelter, command and control room, simulator training room, classroom, maintenance area, POL storage area, graded area for parking, concrete or asphalt pad, clear area for GCSs, and clear area for UAS launch/recovery at East Arm.	Potential locations for this activity are constrained by site topography requirements for establishment of the runway and UAS launch/recovery area. A location in the northern portion of the Kofa East Arm is needed to provide an area for sensor testing that is remote from potential interfering electrical/communications signal transmissions. Multiple sites or layouts within the identified area in the upper portion of the Kofa East Arm may be suitable, but the activity is not yet designed sufficiently to allow site-specific analysis. Should this activity be selected, additional NEPA analysis, including other reasonable alternatives, would be required prior to its implementation.
K031	Construct lagoon for Kofa Sewage Lagoon Expansion	There are no reasonable alternatives to the proposed activity because the location is constrained by the requirement to support expansion of sewer infrastructure at the existing sewage treatment facility.

Note: Some project identifiers in maps represent unrelated activities that are grouped due to geographical proximity. Graphic representation on maps may be larger or smaller than the project area.

It is possible that not all of the activities subjected to detailed analysis will be selected for implementation and it is possible that some selected projects would not be implemented due to changes in mission needs or technology.

There are three cantonment-type areas on YPG: YTC, MAA, and the Kofa cantonment area in the eastern part of the Laguna Region. These areas are already largely developed and contain limited additional developable land. Concentrating new buildings and facilities in these areas, which are somewhat disturbed from previous development, would result in less environmental impact than placing new buildings and facilities on undeveloped land outside of cantonment areas. There is no appreciable difference in direct environmental impacts based on location within these cantonment areas, unless a given location would require construction of additional parking areas. The planning process maximized the use of

developable land near existing parking to minimize the need for additional land disturbance. The planning process also evaluated operational efficiency to determine where facilities and structures would be placed. By grouping like activities and placing facilities in proximity to existing supporting infrastructure (such as tracked vehicle routes or the airfield) the environmental impacts of operation would be minimized.

2.6 Alternative to Implement a Subset of the Proposed Action

The U.S. Army has the option of selecting only certain of the proposed construction, testing, and training activities for implementation, and to re-evaluate options at a future time. Should a subset of Proposed Action components be selected for implementation, the subset would be clearly identified in the ROD.

2.7 Alternatives Eliminated from Further Consideration

This section provides a brief description of other alternatives that were not carried forward for detailed analysis in this FPEIS. The rationale for each alternative being eliminated from consideration is provided.

2.7.1 Discontinue Use of Yuma Proving Ground as a Military Proving Ground

YPG has not been identified for closure under any of the Base Closure and Realignment Acts, and closure would require congressional authorization. Closure of YPG also would not meet the need for the Proposed Action. Closure of YPG was not retained as an alternative for analysis in this FPEIS; however, should closure of YPG be recommended by the Army in the future, a separate and specific NEPA analysis would be prepared prior to any such action being undertaken.

2.7.2 Expand the Size of Yuma Proving Ground

There are no plans to expand the size of YPG and this action is not considered in this FPEIS. There is room within YPG to expand existing testing and training areas to meet anticipated needs.

2.7.3 Increase the Military Testing Mission to Encompass Nuclear, Biological, and Chemical Activities

Nuclear, biological, and chemical activities testing is not within the scope of the military mission of YPG and the addition of these types of testing was not considered in this FPEIS. Missions to address these activities are conducted at other DoD facilities.

2.7.4 Proceed with New Construction with No Increase in Testing and Training Capabilities

The activities described under the No Action Alternative would continue to be implemented, as identified in Appendix B. In addition, the construction and demolition proposed in this FPEIS would be done, as described in Tables 2-1 through 2-3. Under this alternative, no increases or changes in capacity for testing and training would be implemented. Testing and training capacity would remain at current levels, the same as under the No Action Alternative.

Many existing facilities on YPG are undersized for their current uses or are being used for purposes other than those for which the structures were designed. The construction and

demolition proposed would result in more efficient operations and enable YPG better to meet its mission requirements. This alternative would not allow the current programs on YPG to evolve to meet future needs that are beyond current testing and training levels.

This alternative was eliminated from further consideration because it would not allow the Army to test new technologies, which would result in an inability to adapt to new conditions and technologies encountered in the theater of combat. This alternative also would not fulfill the purpose of the project, as YPG would be unable to test military ground and aerial vehicle systems, weapons, ammunition, sensors, and guidance systems that are developed in the future. In addition, this alternative would not meet the need for the project to ensure the readiness of U.S. forces and materiel to meet the demands of hot, arid environment theaters around the world, as new challenges could not be met.

2.7.5 Proceed with Increased Testing and Training Capabilities with No New Construction or Demolition

Under this alternative, the current activities described under the No Action Alternative would continue to be implemented, as identified in Appendix B. Testing and training capacity also would be increased as described under the Proposed Action and in Tables 2-1 through 2-6. The construction and demolition proposed in this FPEIS, as described in Tables 2-1 through 2-6, would not be conducted. All future training and testing would be done within existing facilities and munitions impact areas.

Under this alternative, YPG would be able to accommodate fluctuations in testing and training to address changing conditions and technologies, but this would require continued use of facilities and infrastructure that are undersized, that are over-utilized, or that lack appropriate support infrastructure to efficiently meet testing or training requirements.

This alternative was eliminated from further consideration because the inefficiencies that would result from increased testing and training under conditions that are already inadequate would impair the military mission. This alternative would not fulfill the purpose of the project, as YPG would be inadequate for proper testing of military ground and aerial vehicle systems, weapons, ammunition, sensors, and guidance systems. This alternative also would not meet the need for the project to ensure the readiness of U.S. forces and materiel to meet the demands of hot, arid environment theaters around the world, as new challenges could not be met.

2.7.6 Relocate Certain Activities to Other Installations

Under this alternative, some of the proposed activities would be relocated to other military installations, while others would be implemented on YPG. The current activities described under the No Action Alternative would continue to be implemented, as identified in Appendix B. Some of the proposed changes to testing and training described under the Proposed Action and in Tables 2-1 through 2-6 would be implemented at YPG, while other activities would be implemented on other installations. Under this alternative, YPG would be able to increase testing and training to address some of the changing conditions and technologies, but certain aspects of the installation mission would be relocated to other military installations.

This alternative was eliminated from further consideration because relocation of certain mission components to other installations would require a greater commitment of resources to establish new testing or training facilities at the gaining installation, or would relocate some testing and training activities to installations less suited for providing realistic hot and

arid conditions. This alternative would result in mission changes at YPG and at any receiving installations, which have not been authorized. Changing the mission of YPG to relocate certain testing and training activities would not fulfill the purpose of the project. This alternative also would not meet the need for the project to ensure the readiness of U.S. forces and materiel to meet the demands of hot, arid environment theaters around the world.

2.8 Comparison of Environmental Consequences of the Proposed Action and Alternatives

Impacts of the alternatives considered in this FPEIS are summarized in Table 2-10.

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
Air Quality	No change from existing conditions. Benefits from reduced use of portable generators would not occur.	Minor impacts from increased emissions due to operation of minor permanent sources of air emissions created by proposed construction activities, operation of new facilities, vehicle operation to travel to new facilities, and testing and training activities in new locations. Temporary negative impacts due to fugitive dust from construction. Negligible short-term impacts to local air quality as a result of emissions from construction equipment. Minor beneficial impacts from installation of hard power and telecommunications lines with associated reduction in the use of portable generators for testing and training.
Airspace Management	No change from existing conditions.	No change from existing conditions.
Cultural Resources	Potential impact from inadvertent discovery of cultural resources during testing or training activities at current approved locations and levels. Potential for damage to cultural resources from vandalism. As appropriate, surveys, State Historic Preservation Office (SHPO) consultation under the NHPA, and mitigation would be implemented	Potential impact from inadvertent discovery of cultural resources during ongoing activities. Potential impacts to cultural resources in areas not previously surveyed. As appropriate, surveys, SHPO consultation under the NHPA, and mitigation would be implemented. Potential for minor to moderate impacts from construction and training activities and from increased potential for inadvertent discovery due to increase in area where activities would be implemented. Potential for damage to cultural resources from vandalism.
Energy/Utilities	Portable generators would continue to be used at current levels and locations. Continued use of utilities at current levels where demand fluctuates depending on annual testing and training needs. Continued use of bottled water and individual reverse osmosis (RO) systems outside of MAA.	Energy/Electricity Beneficial impacts from construction of more energy-efficient buildings. Energy demand would fluctuate depending on annual testing and training needs, with potential for minor to moderate impacts to energy use in the region in years of high levels of testing and training. Minor beneficial impacts from use of solar-powered lights. Moderate long-term beneficial

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
	<p>Satellite uplinks powered by portable generators would continue to be used for telecommunications.</p> <p>Benefits from reduced use of portable generators would not occur.</p>	<p>impacts to regional energy consumption from installing hard power to locations currently using portable generators.</p> <p>Minor beneficial impacts to air quality from reduced emissions and to hazardous materials management from reduced transport and handling of fuels following installation of hard power to testing and training locations with associated reduction in generator use.</p>
	<p>No change from existing conditions for solid waste. No significant increase in non-hazardous waste is anticipated to occur. No significant impacts to the non-hazardous waste landfill capacity would be anticipated.</p> <p>Potential for conflicts in scheduling multiple users with needs to conduct testing in areas free of electromagnetic interference from cellular/radio towers.</p>	<p>Water No impacts to groundwater as no change in groundwater use is projected. Minor indirect temporary impacts to surface waters during construction.</p> <p>Wastewater New evaporative lagoon at CDH and new sewage lagoon at Kofa cantonment area would have minor beneficial impacts on wastewater utilities.</p> <p>Telecommunications Minor beneficial impacts to air quality from reduced emissions and to hazardous materials management from reduced transport and handling of fuels following installation of hard power to testing and training locations with associated reduction in use of generators and satellite uplinks. Greater flexibility in scheduling users needing test areas free of electromagnetic interference.</p> <p>Solid Waste No significant increase in non-hazardous waste is anticipated to occur. No significant impacts to the non-hazardous waste landfill capacity or regional construction and demolition landfills are anticipated.</p>
Environmental Justice and Protection of Children	No change from existing conditions.	No changes from existing conditions and no impacts.
Fire Management	<p>No change from existing conditions. The potential for wildfires would continue and fire management activities would continue.</p> <p>Fire management from new EOC in the Laguna Region would not occur.</p> <p>YPG will implement the Terms and Conditions specified in the September 9, 2014 Biological Opinion (BO) from USFWS that pertain to fire management in the Kofa Region.</p>	<p>Minor increase in potential for wildfires due to increased testing and training locations.</p> <p>Minor to moderate potential for increased fuel load from growth of exotic invasive plant species.</p> <p>New EOC in the Laguna Region would benefit fire management.</p> <p>YPG will implement the Terms and Conditions specified in the September 9, 2014 BO from USFWS that pertain to fire management in the Kofa Region.</p>
Geological Resources	No change from existing conditions.	No change from existing conditions and no impacts.

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
Hazardous Materials/ Hazardous Waste	<p>No change from existing conditions. No changes in volumes of hazardous materials used or hazardous wastes generated. Potential for leaks from on-road and off-road vehicle use and maintenance, POL spills, and chemical decomposition of munitions constituents of concern (MCOCs) would remain. YPG will continue to conduct regular range assessments to determine the potential for migration of MCOCs. YPG would implement appropriate measures should off-range migration that could affect human health or the environment be indicated.</p>	<p>Impacts and sampling described for the No Action Alternative would occur, plus additional potential for minor impacts from leaks associated with vehicle use and maintenance, POL spills, and chemical decomposition of MCOCs as a result of increased testing and training in new and expanded testing areas. Activities would comply with the best management practices (BMPs) identified in the Spill Prevention, Control, and Countermeasures Plan (SPCCP) and Installation Spill Contingency Plan (ISCP).</p> <p>Minor short-term increase in hazardous waste generation due to demolition of buildings containing asbestos-containing materials (ACMs). Potential for minor impacts from increased use and disposal of certain hazardous materials during testing and training activities in new areas. Potential for impacts from installation of air conditioning components.</p> <p>Minor beneficial effects from construction of appropriate down-range facilities to store and contain POLs and reduce the potential for spills. Minor beneficial effects from installation of hard power and telecommunications to testing and training sites that would reduce use of portable generators and also reduce the transport of fuel.</p>
Land Use	No change from existing conditions.	<p>Minor changes from conversion of open space to other uses, but consistent with military land uses. The slight changes in the noise zones that may result from large artillery testing would not require any changes to the land uses designated in the Yuma County 2020 Comprehensive Plan.</p>
Noise	<p>No change from existing conditions. Continued sporadic impacts to wildlife from noise during testing and training activities. Continued potential for complaints from the Martinez Lake area.</p>	<p>Any slight changes in the noise zones that may result from large artillery testing would not affect use of surrounding lands outside the installation boundary.</p> <p>Minor long-term impact on wildlife from disturbance from sporadic noise from activities in new or expanded testing and training areas.</p> <p>Minor temporary impact to wildlife from noise due to construction activities.</p> <p>Potential for minor disturbance of outdoor conversations due to construction noise. No permanent sensitive human receptors in proximity to construction areas.</p>
Recreation	<p>No change from existing conditions. No new recreation facilities would be constructed.</p>	<p>No impacts to off-post recreational opportunities. Potential for minor to moderate impacts to recreational hunting in the Cibola Hunting Area, Martinez Hunting Area, and the East Arm Hunting Area due to expanded testing and training areas. Beneficial impacts to other on-post recreation from construction of new park, youth center addition, and improvements to other passive recreational</p>

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		<p>opportunities.</p> <p>Loss of greenspace in MAA that is used by residents for passive recreation from Cox Field improvements.</p> <p>Potential disruption of some on-post recreation during construction.</p>
Safety	<p>No change from existing conditions. Safety benefits that would result from the Proposed Action would not occur.</p> <p>Potential for recreational users in southern portion of Kofa NWR in YPG Airspace R-2307 to be within safety fans for operations and at risk.</p>	<p>Potential for minor increase in safety incidents due to implementing activities in the new or expanded testing and training areas, but the rate of incidents (expressed per worker hour) would not be expected to change.</p> <p>Minor potential increase in frequency of wildfire ignition due to implementing activities in new or expanded testing and training areas.</p> <p>Potential for minor short-term impacts to construction worker safety.</p> <p>Potential minor temporary impacts to traffic safety due to construction-related traffic.</p> <p>Moderate benefits to operational safety due to AT/FP improvements, MEDEVAC helicopter pads, flood upgrades on Aberdeen Road, pedestrian safety from D Street conversion to walkway, and installation of shading at multiple locations.</p> <p>Minor benefit to personnel safety from installation of hard power and telecommunications in the Cibola and Kofa Regions due to decreased transportation of fuel and portable generators.</p> <p>Minor benefit to personnel safety due to reduced heat stress following installation of new shade structures.</p> <p>Minor benefit to safety from placing overhead wires underground.</p> <p>Moderate benefit from relocating safe haven away from YPG personnel.</p> <p>Potential for recreational users in southern portion of Kofa NWR in YPG Airspace R-2307 to be within safety fans for operations and at risk.</p>
Socioeconomic	<p>No change from existing conditions. Short-term benefits to local economy from construction would not occur.</p>	<p>Minor short-term beneficial impacts to local economy from purchase of building materials, short-term construction jobs, and secondary spending by construction workers.</p> <p>Potential for negligible to minor impacts on local fuel and water retailers from reduction in demand for these services on YPG.</p>
Soils	<p>No change from existing conditions. Continued impacts to soils from testing and training activities at authorized locations and levels.</p>	<p>Impacts described for the No Action Alternative would continue, but with increased potential for impacts due to new or expanded testing and training areas.</p> <p>Increase in disturbed area and disturbance to soils used for dismounted maneuver training, munitions impact areas, DZs, and UAS launch/recovery areas resulting in moderate impacts to highly erodible soils that are disturbed and negligible to</p>

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		<p>minor impacts to disturbed soils that are classified as not highly erodible to moderately erodible.</p> <p>Minor impact from establishment of TGPs in the Cibola Region.</p> <p>Long-term indirect impact from degradation of munitions into soils in munitions impact areas.</p> <p>Disturbance due to construction resulting in negligible to minor impacts to soils that are not highly erodible to moderately erodible and moderate impacts to highly erodible soils.</p> <p>Minor impacts from disturbance to soils during installation of utilities.</p>
Threatened and Endangered Species and Species of Concern	<p>No change from existing conditions. Potential for minor impacts to threatened, endangered, or sensitive (TES) species, as testing and training activities continue at existing locations and levels. YPG implements those portions of the Arizona Interagency Desert Tortoise Team <i>Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat</i> that are consistent with the military mission and will consult with USFWS on projects in desert tortoise area should the species be listed.</p> <p>YPG will consult or conference with USFWS, as appropriate, for impacts that may affect Sonoran pronghorn.</p>	<p>Transient or Incidental Species Negligible to minor impacts likely from displacement during construction, testing, or training activities.</p> <p>Sonoran Desert Tortoise Long-term moderate impacts from loss of habitat and potential for incidental mortality. YPG implements those portions of the Arizona Interagency Desert Tortoise Team <i>Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat</i> that are consistent with the military mission and will consult with USFWS on projects in desert tortoise area should the species be listed.</p> <p>Sonoran Pronghorn Long-term minor impacts from visual and auditory disturbance to the experimental population due to testing and training activities. Potential threat to individual pronghorn from munitions testing or UXO. Potential alteration of foraging habitat in the event of wildfire. YPG will consult or conference with USFWS, as appropriate, for impacts that may affect Sonoran pronghorn.</p> <p>Banded Gila Monster Minor long-term impacts from loss of habitat and disturbance from construction, testing, and training activities.</p> <p>TES Bat Species Negligible to minor long-term impacts due to loss of foraging habitat.</p> <p>Loggerhead Shrike Moderate long-term impacts from loss of habitat and disturbance caused by construction, testing, and training activities.</p> <p>Western Burrowing Owl Moderate long-term impacts due to loss of habitat and disturbance from construction, testing, and training activities.</p> <p>Parish's Onion Negligible to minor long-term impacts from incidental mortality and due to the slow growth rate of these species.</p>

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		<p>Other TES Plants Minor long-term impacts from clearing of vegetation for construction, testing, and training purposes.</p> <p>Wild Horses and Burros Minor temporary impacts due to construction activities. Minor long-term impacts due to displacement and loss of habitat from establishment and use of new or expanded testing and training areas. No impacts to other species.</p>
Traffic/ Transportation	No change from existing conditions. No new impacts would occur.	<p>Potential increase in temporary road closures and construction-related traffic. Minor short-term impact.</p> <p>Long-term beneficial impacts from improved traffic safety due to flood upgrades, intersection improvements, and range road improvements.</p> <p>Long-term benefits to mission from increased efficiency of military air activities due to new infrastructure.</p>
Vegetation	No change from existing conditions. Continued impacts to vegetation from testing and training activities at current locations and levels.	Minor to moderate impacts due to removal of vegetation for construction, creation of new or expanded testing and training areas, and use of new impact areas.
Visual Resources	No change from existing conditions. Current testing and training activities would continue to have negligible to minor impacts to visual resources.	<p>Temporary minor impacts from construction-related airborne dust.</p> <p>Recurring temporary minor impacts from dust and other obscurants caused by testing and training.</p> <p>Potential long-term minor impacts from increased use of lighter-than-air UASs.</p> <p>Potential minor long-term impacts from appearance of new buildings.</p>
Water Resources	Continued impacts from contaminants and water consumption due to testing and training activities at current locations and levels.	<p>Potential temporary minor adverse impacts to water quality resulting from sediment runoff during construction and an increase in impervious surfaces following construction, reduced with use of appropriate BMPs</p> <p>Minor to moderate increased potential for impacts to groundwater from degradation of munitions.</p> <p>Minor potential for offsite impacts due to transport of contaminants and sediments generated from stormwater runoff on new or expanded testing and training areas.</p> <p>Potential negligible reduction in groundwater recharge rates due to new impervious area.</p>
Wildlife and Fisheries	No change from existing conditions. Minor impacts to wildlife would continue under current levels of testing and training activities at current locations.	<p>Minor short-term impact from incidental mortality, displacement, and disturbance due to construction.</p> <p>Potential for minor to moderate long-term impacts from incidental mortality, displacement, and disturbance due to creation and use of new or expanded testing and training areas.</p>

TABLE 2-10
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		Minor to moderate long-term indirect impacts from loss of habitat due to construction, UAS launch/recovery areas, utilities, and TGP and only minor impacts from disturbance of habitat due to use of DZs.

2.9 Mitigation Measures and Monitoring Procedures

Table 2-11 summarizes the proposed mitigation measures for resource areas with the potential for significant impacts from the Proposed Action. Avoidance of resources would be considered as the primary mitigation measure, but it would not be practicable to avoid all resources for all proposed activities. The table shows potential mitigation measures, including implementation of BMPs, in the event avoidance is not practicable.

TABLE 2-11
Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
Air Quality	Yes, for activities in non-attainment area	Implement BMPs during construction to reduce fugitive dust emissions. Yuma would revise the Title V permit as needed to align with Arizona Department of Environmental Quality (ADEQ) regulations and Title V permit monitoring, recordkeeping, and reporting requirements.	3.2.2.4
Airspace Management	No	Continue coordination with MCAS Yuma and private/commercial air traffic controllers.	3.3.2.3
Cultural Resources	Yes	Implement Integrated Cultural Resources Management Plan (ICRMP) procedures; avoid or protect significant sites; monitor protection measures; implement data recovery; coordinate/consult with SHPO and Native American tribes, as appropriate, and implement any required mitigation from SHPO consultation. Environmental Awareness Training for persons working in areas where paleobotanical resources occur.	3.4.8
Energy/Utilities	No	Incorporate energy-efficient design into new buildings. Use solar lights where practicable. Recycle/reuse to the extent practicable. Install hard power to additional locations to reduce reliance on diesel-powered generators at testing and training locations. Recycle and reuse to the extent practicable.	3.5.2.4
Environmental Justice and Protection of Children	No	None	3.6.2.3

TABLE 2-11
 Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
Fire Management	Yes	<p>Develop and implement a program to monitor invasive plants; continue to implement Integrated Training Area Management (ITAM); coordinate with BLM, Kofa NWR, and U.S. Forest Service (USFS) on fire management; develop and interpret wildfire data with other agencies.</p> <p>Use Geographic Information System (GIS) fire risk model to identify areas of high fire risk and incorporate into range operations as practicable.</p> <p>Implement Terms and Conditions 1a, 2a, 2b, and 3a from the USFWS BO of September 9, 2014.</p>	3.7.2.4
Geological Resources	No	None	3.8.2.3
Hazardous Materials/ Hazardous Waste	Yes	<p>Continue management of hazardous materials; consult with state and federal agencies; manage and dispose of hazardous materials and wastes in compliance with applicable laws, regulations, and guidance; follow standard protective measures and procedures. Update, as necessary and implement SPCCP and ISCP. Require non-ozone-depleting chemicals as refrigerants in new air conditioning systems. Continue to conduct regular range assessments to determine the potential for migration of MCOCs and implement appropriate measures to protect human health.</p>	3.9.2.4
Land Use	Yes	Continue coordination with local plans to avoid incompatibilities, as appropriate.	3.10.2.4
Noise	Yes	<p>Require construction workers to use appropriate hearing protection.</p> <p>Maintain aircraft operations in compliance with established Installation Compatible Use Zones (ICUZs).</p> <p>Locate noise-generating activities away from sensitive noise receptors and use natural barriers where practicable.</p> <p>Conduct noise-intensive activities during favorable weather conditions where practicable.</p> <p>Use lower noise products where practicable.</p> <p>Continue noise complaint management procedure and implement fly-neighborly programs.</p> <p>Adjust timing of disruptive activities and inform the public of unusual increases in intensity of testing and training.</p>	3.11.2.4
Recreation	No	None	3.12.2.4

TABLE 2-11
Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
Safety	Yes	<p>Minimize potential risks and exposure; require contractors to follow Occupational Safety and Health Administration (OSHA) standards; comply with YPG safety program and specific safety protocols for testing and training activities.</p> <p>Use GIS fire risk model to identify areas of high fire risk and incorporate into range operations as practicable.</p> <p>Verify there are no people in the portion of Safety Danger Zones (SDZs) extending into the Kofa NWR, primarily by visual or electronic means. Helicopters will be used to locate people only where large portions of an SDZ overlap Kofa NWR, primarily in R-2307.</p>	3.13.2.4
Socioeconomics	No	None	3.14.2.4
Soils	Yes	Avoid highly erodible soils; minimize soil disturbance to the extent practicable; implement construction BMPs and stormwater controls; continue to implement ITAM program and Integrated Natural Resources Management Plan (INRMP).	3.15.2.5
Threatened or Endangered Species and Species of Concern	Yes	<p>Avoid known sensitive habitats during siting process. Avoid impacts to water sources; schedule construction projects to avoid or minimize conflicts with reproduction; avoid implementing activities in areas where sensitive species occur to the extent practicable; relocate or deter species to minimize impacts if necessary; implement INRMP procedures. Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible. YPG implements those portions of the Arizona Interagency Desert Tortoise Team <i>Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat</i> that are consistent with the military mission. Should the Sonoran desert tortoise be listed under the Endangered Species Act (ESA), activities proposed in areas where the tortoise may occur on YPG would be re-evaluated with regard to potential impacts and appropriate consultation with the USFWS would be conducted prior to any land-disturbing activities. YPG will notify USFWS and AGFD if Sonoran pronghorn are observed on YPG that are injured, sick, or dead. YPG will consult or conference with USFWS, as appropriate, for impacts that may affect Sonoran pronghorn.</p> <p>YPG will implement the following additional conservation measures:</p> <ul style="list-style-type: none"> Implement the 2014 Final Incident Response Protocol for Sonoran Pronghorn. 	3.16.2.4

TABLE 2-11
 Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
		<ul style="list-style-type: none"> Avoid placing activities in proximity to artificial water sources (suitable for Sonoran pronghorn) to the extent that such action is consistent with the military mission. Adhere to the terms of the Memorandum of Understanding (MOU) between the Kofa NWR, Imperial NWR, BLM, and YPG, which provides procedures and guidance for cooperation and collaboration on wildland fire issues. This includes notifying interagency dispatch of any wildfire on YPG lands. 	
Traffic/Transportation	Yes	Implement traffic control procedures as appropriate; minimize construction activities during peak traffic periods on YPG.	3.17.2.3
Vegetation	Yes	Develop and implement a program to monitor invasive plants; continue to implement ITAM and INRMP; implement appropriate construction BMPs and stormwater controls. Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.	3.18.2.4
Visual Resources	Yes	Apply appropriate dust suppression practices; design buildings to blend with existing structures; continue implementation of the Environmental Awareness program.	3.19.2.4
Water Resources	Yes	Develop and implement Construction Stormwater Pollution Prevention Plans (SWPPPs) to reduce potential for environmental exposure to pollutants in stormwater. Implement appropriate construction BMPs and stormwater controls; design to maximize use of pervious and semi-pervious surfaces; continue to implement INRMP; implement any mitigation required in Section 404 permits obtained.	3.20.2.4
Wildlife and Fisheries	Yes	Avoid wildlife concentration areas and sensitive habitats (e.g. water sources); schedule construction projects to avoid or minimize conflicts with reproduction; continue to implement INRMP. Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.	3.21.2.4

Notes: Information provided is summarized from the analysis for each resource area in Section 3. Mitigation measures identified would be implemented, as appropriate, for each specific activity undertaken. Only those measures appropriate for a given action would be implemented.

2.10 Preferred Alternative

The U.S. Army has given consideration to input from government agencies and tribal organizations and has determined that the Preferred Alternative is to implement the selected components of the Proposed Action. Specifically, the Preferred Alternative would include the following:

- Implement proposed activity L030b, the smaller of the two considered LTAs, rather than proposed activity L030a.
- Implement Option 1 for proposed activity L031.
- Implement Option 1 for proposed activity L034.
- Implement a reduced area for proposed activity C034-a, reducing the area of the expanded Graze Range munitions impact area and avoiding potential impacts to a known resource.
- Implement a reduced area for proposed activity K003, establishing the northern boundary of the expanded munitions impact area even with the northern boundary of the Ramsdell Ranch Advanced Munitions Range (1,000 meters [m] south of the boundary of Kofa NWR) and setting the western boundary of the expanded munitions impact area parallel to and 500 m east of the boundary of Kofa NWR.
- Implement proposed activity K024 rather than proposed activity C066.
- Implement a reduced area for proposed activity K026 (1,826 ac less than originally proposed), establishing the northern boundary of the LTA even with the northern boundary of the Ramsdell Ranch Advanced Munitions Range (1,000 m south of the boundary of Kofa NWR).
- Implement the remainder of the Proposed Action, as proposed.

The components of the Preferred Alternative that would be implemented in the Laguna Region are depicted on Figure 2-16. The components of the Preferred Alternative that would be implemented in the Cibola Region are depicted on Figure 2-17. The components of the Preferred Alternative that would be implemented in the Kofa Region are depicted on Figure 2-18.

SECTION 3

Affected Environment and Environmental Consequences

3.1 Introduction

This section provides descriptions of the affected environment for the valued environmental components (VECs) analyzed in this FPEIS and presents the environmental consequences of the actions carried forward for detailed analysis. The description of each VEC addresses its baseline, or current, condition and identifies the factors that resulted in this condition. This FPEIS identifies important past human actions and natural events that have contributed to the condition of each VEC analyzed in detail.

3.1.1 Presentation of VECs

VECs are the resources, ecosystems, and human communities of concern that could be affected by the Proposed Action. The Army reviewed the VECs and ranked them based on their relative potential to be affected by the Proposed Action (see Section 1.3.3). Based on this ranking, VECs were grouped into one of three categories:

- Primary VEC (high potential for impact)
- Secondary VEC (moderate potential for impact)
- Low VEC (low potential for impact)

Table 3-1 identifies the category to which each VEC was assigned and the EIS section where each is discussed.

TABLE 3-1
Characterization of Valued Environmental Components
Yuma Proving Ground

VEC	Described In
Primary VECs (High Potential for Impact)	
Air Quality	Section 3.2
Cultural Resources	Section 3.4
Energy/Utilities	Section 3.5
Hazardous Materials/Hazardous Waste	Section 3.9
Land Use	Section 3.10
Noise	Section 3.11
Safety	Section 3.13
Soils	Section 3.15
Threatened and Endangered Species and Species of Concern	Section 3.16
Vegetation	Section 3.18

TABLE 3-1
 Characterization of Valued Environmental Components
Yuma Proving Ground

VEC	Described In
Primary VECs (High Potential for Impact)	
Visual Resources	Section 3.19
Wildlife and Fisheries	Section 3.21
Secondary VECs (Moderate Potential for Impact)	
Recreation	Section 3.12
Socioeconomics	Section 3.14
Traffic/Transportation	Section 3.17
Water Resources	Section 3.20
Low VECs (Low Potential for Impact)	
Airspace Management	Section 3.3
Environmental Justice and Protection of Children	Section 3.6
Fire Management	Section 3.7
Geological Resources	Section 3.8

Subsistence resources are not considered a VEC at YPG. No persons use YPG for subsistence resources; therefore, subsistence resources are not discussed in this FPEIS.

3.1.2 Framework for Impact Analysis

This section describes the approach to impact assessment and the determination of environmental consequences for the No Action Alternative and the Action Alternatives. As appropriate, the analysis of impacts builds on existing environmental documentation supporting testing and training activities on YPG (see Section 2.3.2).

3.1.2.1 Alternatives

For each resource area, qualitative and/or quantitative analysis of the environmental and socioeconomic consequences of implementing the No Action Alternative or the considered alternatives to the Proposed Action are presented. The alternatives analyzed in this FPEIS were described in Section 2 and are summarized below.

No Action Alternative. The testing and training activities of the No Action Alternative are current and ongoing activities on YPG. Under the No Action Alternative, testing and training would continue at the current levels. No test areas, training areas, munitions impact areas, or DZs would be created or expanded and no construction or demolition would occur. See Tables B-1 through B-3 in Appendix B for a listing of the No Action activities in each region.

Proposed Action/Preferred Alternative. The Proposed Action includes all the components of the No Action Alternative plus the new construction and associated demolition, new or expanded testing, and expanded training proposed in this FPEIS, all components occurring on YPG, and new testing and training proposed to meet anticipated testing or training

needs. Where there are feasible alternatives for activities under the Proposed Action, the impacts of each alternative are addressed. See Tables 2-1 through 2-6 in Section 2 for a listing of activities included in the Proposed Action and Tables 2-7 through 2-9 for a discussion of reasonable alternatives to activities analyzed in detail. The discussion in the following sections addresses the anticipated impacts of implementing the Proposed Action/Preferred Alternative. The discussion of impacts addresses the areas where the Preferred Alternative would include selection of a portion of the Proposed Action. Refer to Tables 2-1, 2-3, and 2-5 and to Appendix C for the project-specific impacts of projects analyzed in detail. Where there is no specific discussion of the Preferred Alternative, there is no discernable difference in the impacts that would result under either the Proposed Action or the Preferred Alternative.

3.1.2.2 Context and Intensity

Context and intensity were considered in determining the significance of potential impacts (40 CFR Section 1508.27). Context is the location of the action and the areal extent of potential impacts. For site-specific infrastructure improvement projects, the locations for routine test and training types and support activities may be more general or may be at a specific site or sites (for example, large-caliber weapons can be fired from multiple firing points throughout KFR). The areal extents of potential impacts for each resource typically vary.

The intensity of a potential impact refers to its severity and takes into account beneficial and adverse impacts; public health and safety effects; unique geographical characteristics; the level of controversy associated with impacts on the human environment; whether the action establishes a precedent for further actions with significant effects; the level of uncertainty about projected impacts; whether the action is related to other actions that are individually insignificant but cumulatively significant; effects upon scientific, cultural, or historical resources, or sites or objects listed in the National Register of Historic Places; effects upon any species listed under the Endangered Species Act; and the extent to which the action threatens to violate Federal, state, or local environmental protection laws or constrain future activities. Intensities that are classified as “none” to “moderate” are considered less than significant in this analysis. Significant adverse impacts are those categorized as “severe.” Potential beneficial impacts are discussed separately from potential adverse impacts. The following categories were used to classify impacts to resources:

- None: No measurable impacts are expected to occur.
- Negligible: Barely perceptible adverse impacts are expected.
- Minor: Short-term but measurable adverse impacts are expected. Impacts may have slight impact on the resource.
- Moderate: Noticeable adverse impacts would have a measurable effect on a resource and are not short-term.
- Severe: Adverse impacts would be obvious, both short-term and long-term, and would have serious consequences on a resource. These impacts would be considered significant.
- Beneficial: Impacts would benefit the resource/issue.

3.1.2.3 Presentation of Analysis

For each resource, the significance criteria are presented, followed by a discussion of the potential direct, indirect, and cumulative impacts for the No Action Alternative and the considered alternatives for the Proposed Action/Preferred Alternative. Section 3.1.3 provides the basis for the cumulative effects analysis. Measures to avoid or minimize the potential for impacts to a resource area are identified. Section 3.22 provides a summary of impacts and mitigation.

The level of analysis for each VEC is commensurate with the potential for significant adverse impacts, with primary VECs receiving the greatest level of detail in the analysis.

Quick Look Questions prepared to support cumulative effects analysis for the VECs also were used to support the relative VEC ranking presented in Table 3-1. An explanation of how to use the Quick Look Questions is found in Section 3.1.3.2. The answers to the Quick Look Questions for each VEC are provided in Appendix D. The Army would implement procedures and management practices to avoid, minimize, and mitigate impacts to VECs, as appropriate, and these measures are discussed as they apply to each resource area.

3.1.3 Cumulative Effects Analysis

This section describes the approach used to analyze potential cumulative impacts associated with the Proposed Action/Preferred Alternative in the context of potential interactions with other past, present, and reasonably foreseeable actions in the region. The CEQ regulations implementing NEPA (40 CFR 1508.7) define a “cumulative impact” for purposes of NEPA as follows:

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable 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.

Cumulative impacts would occur if incremental impacts of the Proposed Action, added to the environmental impacts of past, present, and reasonably foreseeable similar actions, would result in an adverse effect to resources in the region. Actions that have the potential to combine with incremental effects of the Proposed Action to result in cumulative impacts are those that are similar to the Proposed Action or could affect environmental resources similar to those affected by the alternatives considered, are located in geographic proximity to YPG, and have occurred, are ongoing, or are reasonably foreseeable. Reasonably foreseeable actions include those that have an application for operations pending before an agency with permit authority and would occur in the same timeframe as the Proposed Action and alternatives.

The analysis of cumulative impacts in this FPEIS follows CEQ and Army guidance (CEQ, 1997; USAEC, 2007), and provides a systematic approach for assessing cumulative impacts.

3.1.3.1 Other Past, Present, and Reasonably Foreseeable Future Actions

Because off-post testing is independent of on-post testing, creates only minor impacts of limited extent, and is spatially separated from YPG, no interaction effects with testing or training activities on YPG beyond incremental additions to regional air emissions would result. The off-post locations are not considered in the cumulative impacts except for air quality.

The potential for other past, present, and reasonably foreseeable future actions to interact with the Proposed Action/Preferred Alternative to create cumulative effects varies among the different resource areas. Considered projects are discussed for each resource area with a potential for cumulative impacts. Resource areas that would not be impacted by the Proposed Action/Preferred Alternative and would have no potential for cumulative effects are identified as such and no project list is provided for these resource areas.

YPG is considering the development of a solar renewable energy resource on the installation to increase YPG's energy security and meet federal mandates and legislative requirements to increase production and consumption of renewable energy resources. Any solar renewable energy resource project would be done through an EUL with a private company. Solar technologies under consideration by the Army include solar PV, dish-engine system based on the Dish Stirling, and dry-cooled concentrating solar thermal technologies. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). An EUL for solar power generation is not a component of the Proposed Action, and a separate, specific NEPA analysis would be conducted for any such project that would be developed. The potential for cumulative impacts from development and operation of such a facility was considered in the assessment of potential cumulative impacts in this analysis, based on what was known at the time this document was prepared. Should design specifications become better defined prior to the decision on this action being made and if those design changes would result in changes to the analysis of cumulative impacts provided herein, this document will be revised prior to the decision document being signed.

The Quartzsite Solar Energy Project is proposed approximately 10 miles north of Quartzsite, Arizona in La Paz County. Implementation of this project, which is scheduled to be in operation in 2015, would construct, operate, maintain, and decommission a 100-MW solar thermal generation power plant using dry-cooling technology with a 1.5-mile generator tie-line, switchyard, and access road. An EIS was prepared and a ROD for this project was signed in May 2013 (U.S. Department of Energy and BLM, 2013). This solar energy project is not a component of the Proposed Action, but the potential for cumulative impacts from development of this project was considered in the assessment of potential cumulative impacts in this analysis.

There are five proposed or recently operational solar projects within approximately 10 miles of YPG that would be implemented on BLM lands. The Paloma project and the Aqua-Caliente solar project are adjacent projects that have been recently constructed and are operational to the east of YPG. The LaPosa Solar Terminal is proposed as a 2,000 MW concentrated solar power trough that would be along U.S. Highway 95 (US 95) between the Cibola Region and the Kofa NWR in the vicinity of Stone Cabin. The Nextlight Quartzsite project would be a 500-MW concentrated solar power trough located south of Quartzsite. The Wildcat Quartzsite project is proposed as an 800-MW concentrated solar power tower facility that would be along US 95 between the Cibola Region and the Kofa NWR. These solar projects are not components of the Proposed Action, but the potential for cumulative impacts from development of these projects was considered in the assessment of potential cumulative impacts in this analysis.

3.1.3.2 Approach for Assessing Cumulative Effects

To determine whether specific VECs would have the potential for cumulative effects with other past, present, and reasonably foreseeable future actions and be included in the cumulative impact assessment, the FPEIS analysis followed the CEQ/Army 11-step process to assess potential cumulative effects:

- Step 1. Identify significant cumulative issues associated with the Proposed Action
- Step 2. Establish geographic scope for analysis for each VEC
- Step 3. Establish a timeframe for the analysis for each VEC
- Step 4. Identify other actions affecting VECs
- Step 5. Characterize the sensitivity of VECs
- Step 6. Characterize the stresses on the VECs
- Step 7. Define a baseline condition for the VECs
- Step 8. Identify cause-effect relationships between included activities and VECs
- Step 9. Determine magnitude and significance of cumulative effects for each VEC
- Step 10. Modify actions to minimize significant cumulative effects
- Step 11. Monitor cumulative effects during project implementation

The Army uses three levels of analysis to accomplish these steps and evaluate VECs for cumulative impacts. The foundation of this methodology is the Quick Look Questions (USAEC, 2007). Quick Look Questions, which were adapted to suit the environment of the Lower Colorado River Valley Subregion of the Sonoran Desert (Colorado Desert), were used to determine the need to address the direct and indirect effects of the Proposed Action on each VEC, as well as to assess the potential for cumulative impacts. The Quick Look Questions help screen VECs by answering resource-specific questions identified through the NEPA process related to scoping concerns raised, affected environment, and environmental consequences. Depending on the outcome of the Quick Look analysis, each VEC is assigned to one of three levels of cumulative impact analysis:

- No further analysis is needed if the answers to the Quick Look Questions show significant impacts are not likely.
- Analysis and discussion are required if the Quick Look Questions cannot be easily answered.
- Detailed analysis is required if potentially significant impacts could occur.

The Quick Look Questions and answers are provided in Appendix D.

3.1.4 Irreversible or Irretrievable Commitment of Resources

Irreversible or irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of those resources would have on future generations. These effects primarily result from the use or destruction of a specific resource (e.g. energy from hydrocarbons) that cannot be replaced within a reasonable timeframe. Irreversible or irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored after implementing a Proposed Action (e.g. extinction of a species).

Construction, demolition, paving, vegetation clearing, and use of new or expanded testing and training areas would consume electricity, hydrocarbon fuels, and water. Construction and paving would use construction materials, such as concrete and steel. Construction and paving materials

would be recycled to the extent practicable; however, some irreversible or irretrievable resource loss would result. The hydrocarbon-based energy required to conduct these activities or to procure the finished materials would be permanently lost.

Land and natural resources (e.g. flora and fauna) would be used by the Army for construction, testing, and training activities. The loss of desert vegetation and wildlife habitat from proposed activities could be reversed, but the time required would be great for some species and habitats. Mature saguaro cactus (*Carnegie gigantea*), for example, could not be replaced for three to four generations of visitors. Clearing of desert vegetation would result in an irretrievable commitment for near-term future generations, but not an irreversible or irretrievable commitment when considered from a long-term perspective. These areas could be revegetated and restored once military use of the land is no longer needed.

Creation of new or expanded munitions impact areas could result in an irretrievable commitment of these areas for use as test areas. Without the removal of potential UXO, these areas would be precluded from future use.

Loss of cultural resources would represent an irretrievable action, but any such losses that may result from implementation of the Proposed Action would be appropriately mitigated through consultation with SHPO, interested tribes, and other consulting parties.

3.1.5 Short-term Uses of the Environment and Maintenance and Enhancement of Long-term Productivity

Short-term uses associated with the Proposed Action would result in minor adverse impacts to certain resources. Increased soil erosion could result from soil disturbance from construction and paving activities. Washes and off-post waterways could experience increased scour and sedimentation from stormwater runoff. Air quality could be affected by increased dust and vehicle emissions from construction activities and use of new or expanded testing and training areas. Construction and testing/training could also generate increased noise. There would be a short-term beneficial socioeconomic impact associated with jobs and purchase of materials during the construction period. During testing and training, wildlife could be displaced on a short-term basis until the activity, such as drop testing in a DZ, is completed.

Sustainability of the YPG mission would be promoted through measures that would be incorporated into the Proposed Action:

- Implementation of design features, BMPs, and standard construction practices
- Adherence to existing management plans and programs
- Compliance with federal, State, and local regulations

With increased UAS activity, short-term uses of YPG airspace would become more frequent and intensive, but coordination with MCAS Yuma and other users would ensure that airspace remains productive for all users. The long-term productivity of YPG land and airspace would not be affected by the Proposed Action.

3.2 Air Quality

3.2.1 Existing Conditions

3.2.1.1 Ambient Air Quality

Air quality is determined by the concentration of various pollutants in the atmosphere. The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. USEPA has established NAAQS for six criteria pollutants: SO₂, nitrogen dioxide (NO₂), particulate matter (which includes inhalable particulate matter less than or equal to 10 micrometers in diameter [PM₁₀] and inhalable particulate matter less than or equal to 2.5 micrometers in diameter [PM_{2.5}]), CO, ozone (O₃), and lead (Pb). Primary NAAQS are intended to protect public health, while secondary NAAQS are intended to protect the environment (crops, wildlife, and buildings). Individual states may establish more stringent standards. The State of Arizona has adopted the Federal NAAQS. The Primary and Secondary NAAQS for the six criteria pollutants are presented in Table 3-2.

Areas where ambient concentrations of a given pollutant are below the levels established in the NAAQS are designated as being in attainment for that pollutant. Areas that do not comply with the NAAQS for a given pollutant are classified as a non-attainment area for that pollutant. Non-attainment areas are regulated in an effort to lower pollutant ambient concentrations to regulatory standards.

TABLE 3-2
NAAQS for Criteria Pollutants
Yuma Proving Ground

Pollutant	Primary Standards ^a	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ^b	None
	35 ppm (40 mg/m ³)	1-hour ^b	None
Lead	0.15 µg/m ³	Rolling 3-Month Average	Same as Primary
NO ₂	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Average)	Same as Primary
	100 ppb	1-hour ^c	None
PM ₁₀	150 µg/m ³	24-hour ^d	Same as Primary
PM _{2.5}	12.0 µg/m ³	Annual ^e (Arithmetic Average)	15.0 µg/m ³
	35 µg/m ³	24-hour ^f	Same as Primary
Ozone	0.075 ppm	8-hour ^g	Same as Primary
SO ₂	0.03 ppm	Annual (Arithmetic Mean)	
	0.14 ppm	24-hour ^b	
		3-hour ^b	0.5 ppm (1300 µg/m ³)
	75 ppb	1-hour	None

TABLE 3-2
NAAQS for Criteria Pollutants
Yuma Proving Ground

Pollutant	Primary Standards ^a	Averaging Times	Secondary Standards
^a ppm = parts per million, $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter, ppb = parts per billion			
^b Not to be exceeded more than once per year.			
^c 3-year average of the 98 th percentile of daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb			
^d Not to be exceeded more than once per year over 3 years.			
^e 3-year average weighted annual mean $\text{PM}_{2.5}$ concentration from single or multiple community-oriented monitors must not exceed 12.0 $\mu\text{g}/\text{m}^3$ (primary), 15.0 $\mu\text{g}/\text{m}^3$ (secondary).			
^f 3-year average of the 98th percentile of 24-hour concentration at each population-oriented monitor must not exceed 35 $\mu\text{g}/\text{m}^3$.			
^g 3-year average of the fourth-highest daily maximum 8-hour average ozone concentration measured at each monitor within an area over each year must not exceed 0.075 ppm.			

Source: USEPA, 2012

A portion of Yuma County is designated as non-attainment (moderate) for the 24-hour NAAQS for PM_{10} . This non-attainment area includes the southwestern corner of the Laguna Region (Figure 3-1). A request for redesignation to attainment status and a Maintenance Plan were submitted to USEPA on August 16, 2006 (ADEQ, 2006). At this time, the USEPA has not approved the ADEQ Yuma PM_{10} Maintenance Plan (Yuma Metropolitan Planning Organization [YMPO], 2013) and the area remains classified as non-attainment. Data from 2008 through 2010 show that no exceedances of the PM_{10} standard occurred that were not the result of exceptional natural events. The data from 2008 through 2010 indicate that the entire county has moved into attainment with the 24-hour PM_{10} standard (ADEQ, 2011a). The Arizona State Implementation Plan includes statewide Reasonably Available Control Measures (RACMs), as specified in Arizona Administrative Code (AAC) Title 18, Chapter 2, Sections R18-2-604 through R18-2-607 and R18-2-804. RACMs are applicable across all of YPG, not just in the non-attainment area. The RACMs specified at R18-2-804 apply to construction equipment operated at YPG.

3.2.1.2 Affected Environment

The proposed activities discussed in Section 2.4 would be implemented in Yuma County. With the exception of twelve proposed activities in the southwestern corner of the Laguna Region, all of the proposed activities would be implemented in an attainment area for all criteria pollutants. All or portions of twelve proposed activities in the southwestern corner of the Laguna Region would be within the Yuma County moderate PM_{10} non-attainment area. The area is currently in attainment for the other criteria pollutants.

Regulations for the implementation of construction permitting programs are mandated under Title I of the CAA, and regulations for the implementation of operating permit programs are mandated under Title V of the CAA. ADEQ has combined these programs and requires that a facility with emissions obtain a construction/operating permit for all existing stationary sources of air emissions and any future stationary sources of air emissions. YPG currently has a Title V permit (Permit # 43492) dated June 17, 2010. YPG is classified as a major source with potential emissions of NO_x , CO, and volatile organic compounds (VOCs), each exceeding 100 tons per year (tpy). PM_{10} emissions are

less than 100 tpy. Additionally, YPG is an area source of hazardous air pollutants (HAPs) with emissions of a single HAP and facility-wide totals less than 10 tpy and 25 tpy, respectively.

Air emissions tracked on the installation consist of criteria air pollutants, VOCs, HAPs, and ozone-depleting chemicals (ODCs) (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). YPG is required to submit an annual air emissions inventory to ADEQ. Data from the YPG 2012 air emissions inventory are provided in Table 3-3 and are compared to Yuma County's total emissions for 2008 (the most recent year for which county data are available). YPG's point source emissions account for a very small fraction of Yuma County's total emissions.

TABLE 3-3

Comparison of Yuma Proving Ground Air Emissions to Yuma County Air Emissions ^a

Yuma Proving Ground

Pollutant	Yuma County ^b	Yuma Proving Ground	
	Total (tpy)	Point Source (tpy) ^c	% of Total
PM ₁₀	12,661	19.50	0.15
CO	34,765	5.73	0.02
VOC	8,203	17.57	0.21
NO _x	6,782	13.06	0.19
SO ₂	184	0.03	0.02

^a Data in this table are from the most recent available data (2008 and 2012).

^b Source: USEPA, 2013. (The data are from 2008, which is the most recent data available).

^c Source: Yuma Proving Ground 2012 Annual Air Emission Inventory. (Obregon, 2013a, personal communication)

3.2.1.3 Climate Change and Greenhouse Gases

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

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun
- Natural processes within the climate system (e.g. changes in ocean circulation)
- Human activities that change atmospheric composition (such as through burning fossil fuels [natural gas, oil products, and coal]) and that change the land surface (such as deforestation, reforestation, urbanization, and desertification)

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs). Some GHGs, such as carbon dioxide (CO₂) occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (such as fluorinated gases) are derived exclusively from human activities. GHGs may contribute to accelerated climate change by altering the thermodynamic properties of the Earth's atmosphere.

Water vapor (H₂O) is the most abundant and dominant GHG. H₂O varies from 0 to 2 percent in the atmosphere with great spatial variability at any given time because it has a

short life-span. H₂O and other short-lived GHGs, such as CO, tropospheric O₃, and O₃ precursors, are not quantified for their climate change potential (USEPA, 2011a).

GHGs with long life-spans are quantified for their climate change potential, expressed as CO₂ equivalents (CO₂e). These long-lived GHGs include the following pollutants (USEPA, 2010, 2011b):

- CO₂ is a naturally occurring gas produced by natural fires, geothermal events, and aerobic respiration. CO₂ also is a by-product of fossil fuel and biomass combustion and other industrial processes. It is the principal anthropogenic GHG that affects the Earth's radiative balance. CO₂ also may be removed from the atmosphere as part of the biological carbon cycle when it is converted into plant tissue through photosynthesis.
- Methane (CH₄) is a naturally occurring gas with a climate change potential approximately 20 times that of CO₂ with regard to climatic warming. CH₄ is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- Nitrous oxide (N₂O) is a naturally occurring gas with a climate change potential approximately 300 times that of CO₂ with regard to climatic warming. Major sources of N₂O include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- Fluorinated gases (hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF₆]) are man-made compounds containing a mix of hydrogen, fluorine, chlorine, and carbon (HFCs) or just fluorine and carbon (PFCs). HFCs were introduced as a replacement for chlorofluorocarbons, which had been identified as ODCs. The climate change potential of HFCs ranges from approximately 100 to 10,000 times that of CO₂. PFCs also are used as replacements for chlorofluorocarbons in addition to use in manufacturing facilities, where they may be emitted as by-products of processes. PFCs are powerful GHGs, with a climate change potential approximately 5,000 to 10,000 times that of CO₂. SF₆ is a colorless gas and a very powerful GHG, with a climate change potential more than 20,000 times that of CO₂. SF₆ is used primarily in electrical transmission and distribution systems, as well as in dielectrics in electronics. Fluorinated gases typically are emitted in smaller quantities than other GHGs.

The Supreme Court decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007), held that the USEPA has the authority to list GHGs as pollutants and to regulate emissions of GHGs under the CAA. Thereafter, on April 17, 2009, the USEPA issued a proposed finding that CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ contribute to air pollution that may endanger public health and welfare. On December 29, 2009, the USEPA's Greenhouse Gas Mandatory Reporting Rule, 40 CFR Part 98, became effective. Under that rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of CO₂e must submit annual reports to USEPA. YPG's GHG emissions are currently below the mandatory reporting threshold of 25,000 metric tons per year (Obregon, 2013a, personal communication).

Electricity use and transportation are the principal GHG emissions sources in AZ, accounting for nearly 80 percent of the annual gross GHG emissions through combustion of fossil fuels. The remaining use of fossil fuels in the residential, commercial, and industrial

sectors contributes 11 percent of annual GHG emissions. Agricultural activities result in CH₄ and NO₂ emissions that account for another 5 percent of annual GHG emissions, as do industrial process emissions. Industrial process emissions are increasing rapidly due to the increasing use of HFCs as substitutes for ozone-depleting chlorofluorocarbons and the use of PFCs in semiconductor manufacture, as well as from CO₂ released during cement and lime production, and CH₄ released by natural gas and coal mine production. Landfills and wastewater management facilities produce CH₄ and NO₂ emissions that account for 2 percent of annual GHG emissions. GHG emissions from landfills have declined in recent years as landfill gas is increasingly captured for energy purposes. Executive Order (EO) 2010-06, the Governor's Policy on Climate Change, recognizes the importance of reducing GHG emissions while maintaining economic growth and competitiveness in the State of Arizona. EO 2010-06 supports Arizona's continued collaboration in regional and national endeavors to advance clean energy and implement cost-effective solutions to climate change (Climate Change Advisory Group, 2006). Additionally, EO 13514 (Federal Leadership in Environmental, Energy, and Economic Performance dated 8 October 2009), established an integrated strategy toward sustainability in the Federal Government and makes reduction of GHG a priority for federal agencies. EO 13514 was revoked by EO 13693, *Planning for Federal Sustainability in the Next Decade*. The new EO requires similar sustainability planning. Each agency must appoint a Chief Sustainability Officer who will, among other things, ensure that agency policies, plans, and strategies are implemented to achieve the goals of the order. Each agency must also have an annual integrated Strategic Sustainability Performance Plan.

3.2.2 Environmental Consequences

This section discusses direct, indirect, and cumulative impacts to air quality that could result from the No Action Alternative and the Proposed Action. The types of impacts considered in this air quality impact analysis include the following:

- Fugitive dust can result from disturbed soils during construction activities and from testing and training activities, particularly driving on unpaved roads or driving off-road.
- Temporary combustion emissions result from temporary sources of air pollution and GHG emissions during construction of infrastructure improvement projects or use of portable generators to supply electrical power to test and training sites.
- Vehicle emissions are sources of air pollution from incomplete combustion of fossil fuels and also contribute GHGs to the atmosphere.
- Non-vehicle emissions include air pollution and GHGs that derive from combustion of fossil fuels for heating, power generation, or any other non-vehicle sources.
- Beneficial impacts from the Proposed Action. Proposed Action would include a decrease in fossil fuel consumption or a decrease in human-caused fugitive dust.

3.2.2.1 Significance Criteria

The significance criteria that were used to determine potential impacts to air quality were:

- Negligible (less than significant) – Activities that would result in changes to local or regional air quality that are barely perceptible.
- Minor to Moderate (less than significant) – Activities that would result in measurable changes to local or regional air quality that are below regulatory thresholds.

- Minor to Moderate (less than significant) — Activities that would result in increased fossil fuel consumption.
- Severe (significant) — Activities that would result in an exceedance of stationary source emissions greater than major permit modification thresholds for new sources or in exceedance of other regulatory thresholds.
- Beneficial — Activities that would result in a reduction of fossil fuel consumption.

3.2.2.2 Impacts of the No Action Alternative

No emissions due to construction or construction-related traffic would occur. There would be no change in emissions generated on YPG. No impacts to air quality would occur.

YPG and the surrounding area tend to develop air inversion layers overnight from cooling of still air, and these inversion layers dissipate after sunrise due to thermal mixing of the atmosphere. Because inversions can trap air pollutants close to the ground, the YPG burn permit limits open burning to daylight hours to avoid periods of atmospheric inversion. Most vehicle, equipment, and weapons testing also is conducted during daylight hours to minimize potential interactions with inversion layers.

There would be no benefit from reduction of emissions from reduced use of portable generators, as no hard power would be installed to testing and training locations.

3.2.2.3 Impacts of the Proposed Action/Preferred Alternative

The proposed activities would cause minor, short-term adverse impacts on air quality due to construction. These impacts would not be expected to occur past the construction phase. All construction emissions would likely be local, limited to the duration of the construction, and would not have a lasting impact on ambient air quality.

There would be yearly fluctuations in the frequency, intensity, or duration of training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically. More areas on YPG would be available for training activities, but there would be no change in emissions, relative to historical activities, generated by training activities.

The potential emissions from the 12 proposed activities that would be implemented in the PM₁₀ non-attainment area and other proposed activities that would be implemented near the non-attainment area were analyzed. Results indicate that the proposed activities in the non-attainment area would not exceed the conformity threshold for PM₁₀ (Table 3-4, see Appendix E for the detailed analysis).

TABLE 3-4
Proposed Activities in the Yuma County PM₁₀ Non-attainment Area
Yuma Proving Ground

Identifier	Proposed Activities
L002	Construct Runway 18/36 extension, realign Barranca Road, and install hard power at LAAF.
L009	Construct warehouse at YTC.
L010	Construct Instrumentation Development Facility at YTC.
L011	Construct tracked vehicle trail and office at YTC.

TABLE 3-4
Proposed Activities in the Yuma County PM₁₀ Non-attainment Area
Yuma Proving Ground

Identifier	Proposed Activities
L029	Construct optical maintenance facility, graded parking area with power pole farm, and perimeter fencing centered at YTC.
L031	Construct MFFS DFAC.
L032	Expand Bravo LTA.
L034	Construct MFFS Ready Room.
L037	Construct vehicle test course and establish LTA.
L040 ^a	Construct DZ near LAAF (984-ft x 1,969-ft)
L102 ^a	Construct new MFFS Terminal, consolidated rigger facility, CASA Transport aircraft hangar, UAV airfield and hangars, taxiways, UAS flight test area, and other supporting infrastructure at LAAF/MAA.
L106	Construct 4 administrative support buildings and Installations Logistics Complex at YTC.

^a LAAF is not within the non-attainment area; activities are included due to uncertainty regarding the specific locations.

This analysis was conservative in that (1) it assumed all proposed activities in the non-attainment area would be concurrent, although the construction would actually be implemented over a period of years, and (2) it included two proposed activities in proximity to but outside of the non-attainment area. The analysis also included annual emissions from operation following construction, which indicated that testing on the new vehicle test course (L037) would not exceed the conformity threshold. A Record of Non-Applicability has been prepared certifying that “All activities associated with the Proposed Action in the non-attainment area would be below the conformity threshold value for PM₁₀” (Appendix E).

The analysis to support the Record of Non-Applicability also was used as a surrogate to estimate impacts from other proposed land-disturbing activities as well as operational emissions. Specific analysis of other proposed projects was not done because no single project would result in emissions that would exceed regulatory limits.

During construction, air quality impacts could occur from dust carried offsite and combustion emissions from construction equipment. The primary risks from blowing dust particles are to human health and human nuisance values. Fugitive dust can contribute to respiratory health problems and create an uncomfortable work environment. Deposition on surfaces can be a nuisance to those living or working nearby. YPG would implement RACMs to minimize fugitive dust generation. Airborne dust in the Sonoran Desert can carry fungal spores that can cause valley fever. The potential for the Proposed Action to contribute to valley fever outbreaks is discussed in Section 3.13.

Many of the soils at YPG are susceptible to wind erosion and could produce fugitive dust and particulates when disturbed. Disturbance could occur during construction and testing or training activities.

The twelve proposed activities in the PM₁₀ non-attainment are addressed in Appendix E. It should be noted that the proposed activities in the non-attainment area would be below the conformity threshold value for PM₁₀ during both the construction and operating phases.

YPG would encourage use of BMPs during construction to reduce or eliminate fugitive dust emissions. In areas with disturbed and unstable highly erodible soils, BMPs would also be applied when practicable during military operations. BMPs that could be implemented include the following:

- *Application of Dust Suppressants.* Where appropriate, dust suppressants or liquid surfactants would be applied to areas where dust could be disturbed by construction or traffic.
- *Sprinkling/Irrigation.* Sprinkling the ground surface with water until it is moist can be used to control dust on haul roads and other traffic routes. This practice can be applied to almost any site. When suppression methods involving water are used, care would be exercised to minimize over-watering that could cause the transport of mud onto adjoining roadways, which ultimately could increase the dust problem. Mechanical removal of mud from tires would be implemented if necessary.
- *Vegetative Cover.* In areas not expected to accommodate vehicle traffic, vegetative stabilization of disturbed soil is often desirable. Vegetation provides coverage to surface soils and decreases wind velocity at the ground surface, thus reducing the potential for dust to become airborne.
- *Mulch.* Mulching can be a quick and effective means of dust control for recently disturbed areas.

YPG would continue to conduct open burning during daylight hours, in compliance with the burn permit. Additionally, construction activities implemented under the Proposed Action would occur during daytime and most testing and training conducted at the facilities established under the Proposed Action would be scheduled to occur in daytime unless specific night testing or training is required for an activity. As a result, most activity on YPG would not pose a threat to interact with atmospheric inversion to create additional air quality issues.

No substantial changes to air quality from baseline conditions would be likely with implementation of the Proposed Action. Fugitive dust would increase in the immediate area during construction, but impacts would be temporary and minor. Dust abatement measures discussed above would limit the direct and secondary creation of dust.

Emissions would be generated by engine exhaust from construction workers' personal vehicles and off-road construction equipment, including earth-moving equipment, cranes, and trucks. The emissions would primarily consist of NO_x, SO₂, PM, CO, and VOCs, which are typical of the emissions commonly observed at construction sites, and would not extend past the construction period. The construction associated with the proposed activities would be spread through time and the emissions associated with each individual proposed activity would be similar in magnitude to or less than those from construction of a small shopping area. Because of the separation in time and space, any short-term impacts to local air quality would be negligible. Measures such as the use of clean diesel and implementation of anti-

idling measures for construction equipment would be implemented when practicable to further reduce emissions.

Land clearing to establish new DZs and expand/create runways could increase the potential for generation of dust. As with vehicle emissions, land clearing activities would be separated in time and space and individual clearing activities would be of short duration, typically less than 1 week. Construction BMPs would be implemented to minimize the potential for dust generation and sites would be stabilized (disturbed areas typically covered with ABC).

Aircraft operations may increase under the Proposed Action in years when testing and training levels are high and there would likely be a trend to use larger UAS. Either of these could result in an increase of aircraft emissions during testing and training. UAS aircraft tested vary from under 1 lb to 15,000 lb, and include lighter-than-air UAS as well as traditional fixed-wing, rotary-wing, and vertical take-off and landing UAS. Energy sources include batteries, solar cells, heavy fuel, aviation gasoline, and combination systems. Battery and solar cell-powered UAS would not have testing emissions, and combination fuel system UAS testing would produce fewer emissions than traditional fuel UAS testing. Lighter-than-air UAS testing would produce fewer emissions than testing UAS that require powered flight. UAS testing occurs throughout the year and, with the construction of the proposed new UAS launch/recovery areas, individual tests would be spread over a wider area, resulting in reduced localized emissions. UAS testing is not conducted in the non-attainment area. Any increases in emissions related to UAS testing would be minor to moderate and would not contribute to the status of the non-attainment area or cause other regulatory exceedances.

Existing use of the sandblasting facility is authorized in the Title V permit, but increased use of the facility would require modification of the YPG Title V air permit. In addition, the Title V permit requires monitoring, recordkeeping, and reporting for the sandblast facility expansion, for the new POL storage facilities, and for construction activities.

Construction and operation of an East Kofa Operations Center (K025a and (b)) would include a small building complex, perimeter fencing, vehicle maintenance area, storage areas, tactical vehicle wash rack, 40-ton crane, and utility infrastructure. Construction-related fugitive dust would be generated. During operations, engine emissions associated with personnel traveling to and from work and operation of facilities would result in minor increases in vehicle emissions across the lower portion of the Kofa Region. The amount of emissions would be small and any impacts to air quality in the Kofa Region would be negligible to minor.

Construction of Project K030 in the northern portion of the East Arm would include approximately 26 ac of disturbance. Construction-related fugitive dust would be generated. During operations, facility operation and engine emissions associated with personnel traveling to and from work would produce minor emissions in an area with no current source of exhaust emissions. The amount of emissions would be small and any impacts to air quality in the northern portion of the Kofa Region would be negligible to minor.

Minor permanent sources of air emissions would be created by the proposed activities, including building heating units and water heaters; however, these small sources would result in no more than a *de minimis* impact on air quality. If necessary, YPG would revise its

permit to include the new emission sources. Yuma would continue to procure materials and services consistent with the policies outlined in EO 13693, *Planning for Federal Sustainability in the Next Decade*¹ and EO 2010-06, the Arizona Governor's Policy on Climate Change.

GHG emissions are more than 3,000 metric tons below the annual reporting threshold and are expected to remain below this threshold under the Proposed Action.

Most air quality impacts would be minor and temporary. There would be long-term incremental additions of dust from use of new or expanded testing and training areas as a result of vehicle operation, munitions firing, and other activities. The BMPs described above would be implemented to minimize dust generation, as appropriate. There would be slight increases to the baseline levels of dust generated by testing and training activities as fluctuations in use occur, but the activities would occur over a larger area, with the development of new testing and training areas potentially resulting in reduction of dust generation at any one location. There also would be minor long-term increases in combustion engine emissions as vehicle use fluctuates, but these also would be spread over a larger area and, as noted above, would not be expected to result in exceedances of air quality standards. Any contribution to cumulative impacts would be expected to be minor.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Fugitive dust generated by construction of such a facility could interact with other projects to produce temporary, localized, negative cumulative impacts to air quality. It is likely that any such project would result in long-term beneficial impacts to air quality through reduced fossil fuel emissions associated with other electrical generation methods; however, the use of fossil fuels to produce demineralized water to wash mirrors and to transport that water to the facility would partially offset any benefits.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. The Quartzsite Solar Energy Project would remain below all major source thresholds and any contribution to cumulative impacts would be expected to be minor.

Construction, operation, and maintenance of the five BLM solar projects could contribute to cumulative impacts to air quality during construction as a result of emissions from operation of construction equipment and personal vehicles and from the generation of fugitive dust. It is expected that BLM will require that construction contractors implement appropriate BMPs and equipment maintenance procedures to minimize this potential. Once operational, these facilities could contribute to beneficial impacts to regional air quality through a reduction in use of fossil fuels to generate electricity.

3.2.2.4 Mitigation

In addition to the BMPs listed above, YPG would implement the following measures during construction to reduce or eliminate fugitive dust emissions:

¹ The EO revoked EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, both of which were referred to in the Draft EIS.

- Cover haul trucks to prevent materials from becoming airborne.
- Sweep Paved Areas on a regular basis during construction activities.
- Implement use of clean diesel fuel when practicable
- Implementation of anti-idling measures for construction equipment used by contractors when practicable

3.3 Airspace Management

3.3.1 Existing Conditions

There is restricted military airspace over most of YPG. This restricted military airspace also extends over most of the Kofa NWR (Figure 2-3; Table 3-5). The majority of YPG restricted airspace is used for test missions; however, the U.S. Department of Homeland Security operates a Special Use Airspace (R-2309), which restricts military mission access as well as commercial use. Outside of the Department of Homeland Security Special Use Airspace, the

TABLE 3-5
Restricted Airspace
Yuma Proving Ground

Airspace Area ^a	Description
R-2306A	Covers the southern part of the Cibola Region from the surface to 80,000 ft
R-2306B	North of R-2306A in the Cibola Region, from the surface to 80,000 ft
R-2306C	West of R-2306B in the Cibola Region, from the surface to 40,000 ft
R-2306D	North of R-2306B in the Cibola Region, from the surface to 23,000 ft
R-2306E	South of R-2306A in the Cibola and Laguna Regions, from the surface to 80,000 ft
R-2307	Laguna and Kofa Regions east of US 95 and north of Pole Line Road, from the surface to unlimited. Also includes the southern portion of the Kofa NWR
R-2308A	Kofa NWR from 1,500 ft above ground level (AGL) to 80,000 ft
R-2308B	West of R-2308A in East Arm, from the surface to 80,000 ft
R-2308C	North of R-2308A in Kofa NWR from 1,500 ft AGL to 23,000 ft
R-2309	Department of Homeland Security Special Use Airspace. 1.5-mile radius from the surface to 15,000 ft, north of CDH
R-2311	Eastern Kofa Region south of Pole Line Road from the surface to 3,500 ft
R-2306-F	Proposed at Laguna Airfield from the surface to 3,500 ft

^a Airspace areas are shown on Figure 2-3

restricted airspace on YPG is prioritized for testing and training conducted at the installation. YPG restricted airspace allows testing of UASs and weapons systems, such as mortars and rockets, without risk to non-military aircraft. Secondary priority for use of this restricted airspace is for other military users.

MCAS Yuma schedules airspace in the greater Yuma region and manages the restricted airspace over YPG at its Yuma Range, upon release of the airspace by YPG. This arrangement allows flight training opportunities for all services in Arizona, California, and

elsewhere. Private or commercial flights may use YPG restricted airspace during periods of non-use by YPG or other military users, with proper clearance.

3.3.2 Environmental Consequences

Because there would be no potential for impacts to this resource area, the discussion of impacts is abbreviated and significance criteria and proposed mitigation are not provided.

3.3.2.1 Impacts of the No Action Alternative

Under the No Action Alternative, there would be no change to airspace management, beyond those previously analyzed under NEPA. As a result, there would be no potential for direct or indirect negative impacts to airspace management. Non-military use (civilian, commercial, and other federal agencies) would be coordinated through MCAS Yuma to avoid conflicts with the priority remaining military use. No significant cumulative impacts would be expected.

3.3.2.2 Impacts of the Proposed Action/Preferred Alternative

No changes to airspace management, beyond those previously analyzed under NEPA, would occur under the Proposed Action. There would be no potential for direct or indirect impacts to airspace management. Non-military use would be coordinated through MCAS Yuma to avoid conflicts with the priority remaining military use. No significant cumulative impacts would be expected.

3.3.2.3 Mitigation

Because no impacts to airspace management would occur, no mitigation measures are proposed for this resource.

3.4 Cultural Resources

Activities that would be implemented under the Proposed Action that could impact cultural resources include construction and demolition of facilities and infrastructure, as well as changes to current types, levels, and locations of testing and training. This FPEIS addresses the following categories of activities: near-term, well-defined activities at known locations; near-term, well-defined activities at non-specific locations; and less well-defined activities that would occur later in time. Due to the large size of YPG and the possible volume of activities, the Army is adopting a programmatic approach to this analysis to comply with NEPA and Section 106 of the NHPA, and is establishing the framework for future analysis, if required.

3.4.1 Regulatory Setting

YPG manages cultural resources through its ICRMP (YPG, 2012a). The ICRMP sets forth the specific goals, policies, and procedures to identify potential historic properties, assess them for eligibility for listing in the National Register of Historic Places (NRHP), nominate them for listing in the NRHP as appropriate, and manage them. Information on the identification and evaluation of historic properties at YPG in this section comes from the ICRMP. Cultural resources on Federal property are regulated by several laws, regulations, and EOs that require consideration of cultural resources in Federal planning, decision-making, and project execution. These include:

- NHPA, as amended

- Protection of Historic Properties; 36 CFR Part 800, as amended
- NRHP; 36 CFR Part 60
- National Historic Landmarks Program; 36 CFR Part 65
- National Natural Landmarks Program; 36 CFR Part 62
- NEPA
- Historic Sites Act
- Archeological and Historic Preservation Act
- Archaeological Resources Protection Act, as amended
- Protection of Archaeological Resources; 43 CFR Part 7
- Curation of Federally Owned and Administered Archaeological Collections; 36 CFR Part 79
- Native American Graves Protection and Repatriation Act
- American Indian Religious Freedom Act
- Eagle Permits, Permits for Indian Religious Purposes; 50 CFR Part 22.22
- EO 11593, Protection and Enhancement of the Cultural Environment
- EO 13007, Indian Sacred Sites
- Memorandum for Heads of Executive Departments and Agencies, 29 April 1994: Government-to-Government Relations with Native American Tribal Governments
- Memorandum for Heads of Executive Departments and Agencies, 29 April 1994: Policy Concerning Distribution of Eagle Feathers for Native American Religious Purposes
- AR 200-1, Environmental Protection and Enhancement, 13 December 2007
- AR 210-20, Real Property Master Planning for Army Installations, 16 June 2005
- AR 405-80, Management of Title and Granting Use of Real Property, 10 October 1997
- AR 405-90, Disposal of Real Estate, 10 May 1985
- AR 415-15, Army Military Construction and Nonappropriated-Funded Construction Program Development and Execution, 12 June 2006

In addition, there are Program Comments issued by the Advisory Council on Historic Preservation (ACHP) that apply to YPG. Due to the large number of DoD buildings that are 50 years of age or will soon reach that threshold, the ACHP issued several Program Comments that address NHPA compliance for World War II and Cold War Era properties. These Program Comments address Cold War Era (1946-1974) Unaccompanied Personnel Housing, World War II and Cold War (1939-1974) Ammunition Storage Facilities, and World War II and Cold War (1939-1974) Army Ammunition Production Facilities and Plants. Actions covered by the Program Comments include ongoing operations, maintenance, and repair; rehabilitation; renovation; mothballing; cessation of maintenance, new construction or demolition; deconstruction and salvage; remediation activities; and

transfer, sale, lease, and closure of such facilities. Installations have no further requirements to identify, evaluate, treat, mitigate, or consult with the SHPO regarding these facilities, and installations may proceed with actions affecting these properties without further NHPA Section 106 compliance.

Additional ACHP Program Comments that apply to YPG are the Program Comments for all Capehart and Wherry Era (1949-62) Housing, Associated Structures, and Landscape Features. The Program Comments provide NHPA compliance for maintenance and repair; rehabilitation; layaway and mothballing; renovation; demolition; and transfer, sale, or lease from Federal ownership for all Capehart and Wherry Era housing. Installations with Capehart and Wherry Era housing, such as YPG, have to consider the Neighborhood Design Guidelines that are part of the Program Comments when conducting actions that will affect Capehart-Wherry housing and to document that consideration appropriately.

3.4.2 NHPA Section 106 Consultation

YPG consulted with the Arizona SHPO, the ACHP, and interested tribes and developed a Programmatic Agreement (PA; see Appendix F) to address cultural resource issues that arise during normal operations at YPG, as well as those from proposed projects. This PA was completed in November 2014 and defines the process for evaluating potential historic properties that could be affected by activities, including establishing areas that require no additional cultural resource surveys and methods for surveys in those areas that do require survey. The agreement provides a list of project types that have been determined to have no effects or no adverse effect to historic properties and thus require no or limited consultation to implement; and describes the consultation process necessary for those projects that may have adverse effects.

A Section 106 consultation meeting to present the PEIS concept to interested tribal governments was held on June 8, 2011. An initial scoping meeting for interested agencies and tribes was conducted on the afternoon of June 14, 2011, with initial public scoping meetings held later.

Since that time, YPG has been finalizing the projects and locations for the Proposed Action and working to identify reasonable alternatives that would meet mission requirements. Once the Proposed Action reached the draft development stage, Section 106 consultation continued. Letters were sent to the tribes, ACHP, and SHPO on April 24, 2012, to provide an update on project milestones and upcoming meetings. On June 27, 2012, letters inviting participation in the Section 106 process and notifying them of an upcoming consultation meeting were sent to the SHPO, ACHP, and tribes. The tribal letters also specifically sought input regarding their knowledge of properties of religious or cultural significance that could be impacted by implementation of the activities under the Proposed Action.

A Section 106 consultation meeting was held August 21-23, 2012. Sixteen representatives from 10 tribes attended in person, and the SHPO, ACHP, and the U.S. Army Corps of Engineers (USACE) attended via teleconference. The proposed projects and possible PA stipulations were discussed, as well as tribal interest in specific areas of YPG, overarching tribal concerns, and general timelines for the PEIS and PA. In the fall of 2012, YPG prepared the first draft of the PA, based on the previous consultation meetings and input from the ACHP, SHPO, and tribes. The first draft of the PA was distributed to ACHP, SHPO, USACE, and the tribes in early 2013, and comments were received on this draft over the next few months. The draft PA was revised to incorporate and address these comments, as appropriate.

Another consultation meeting, held on April 17, 2013, was attended by thirteen representatives from four tribes, and the ACHP and USACE attended via teleconference. The primary focus of this meeting was to review the important points of the PA, including some of the comments that had been received, and to discuss slight revisions to the proposed project list. Additional comments from the tribes were solicited on both the PA and the proposed projects. The draft PA was then revised to address additional comments received. The fourth and final draft of the PA was sent to all consulting parties on March 24, 2014, and a notice of public availability for review was published in the *Yuma Sun* newspaper on March 23, 2014. The public comment period ran from March 25 through May 12, 2014. The PA allows YPG to fulfill its mission while respecting historic properties and other cultural resources significant to the tribes. A copy of the PA, signed on November 17, 2014, is provided in Appendix F and copies of correspondence with the SHPO, ACHP, and tribal governments are provided in Appendix A.

3.4.3 Existing Conditions

3.4.3.1 Prehistoric and Historic Setting

YPG is at the edge of an archaeological and historical region known as the North American Southwest Culture Area. This region is marked by contrasting and diverse landscapes and divergent cultural adaptations. Many of the historic and prehistoric groups inhabiting the Southwest Culture Area were largely dependent on farming. The use of agriculture was not uniform across the Southwest, and was often supplemented by hunting and gathering of wild resources (YPG, 2012a).

Archaeological evidence on YPG indicates that the area has experienced occupation by native peoples for the past 12,000 years and suggests that occupation consisted mostly of small family groups. Many of the archaeological sites are trails from the nearby Colorado and Gila rivers to hunting areas in the mountains and other areas. While native peoples may have inhabited some of the lands, the scarcity of water, the harsh climate, and the rugged landscape likely prevented more intensive occupation (YPG, 2012a). The local tribes had strong relationships with the land, and archaeological sites or other areas may have traditional religious or cultural importance.

Spanish explorers and missionaries traveled through or near the area beginning in the 1500s, but settlement and occupation did not begin in the area until 1850. Mining-related activities began at that time and intensified in the 1880s. Scattered gold and silver mining took place in the highlands, and farming was concentrated in the Gila and Colorado river valleys. Remnants of abandoned mines, placers, and prospects have been identified within the Dome Rock Mountains, Trigo Peaks, Chocolate Mountains, Middle Mountains, Laguna Mountains, Muggins Mountains, and Castle Dome Mountains (YPG, 2012a).

In 1942, the Army began to use the YPG area as part of a larger Desert Training Center and in 1943, the Yuma Test Branch began to operate along the banks of the Colorado River. Initially, the Army leased buildings in Yuma and conducted test work on bridge designs, boats, and well-drilling equipment near Laguna Dam. The Yuma Test Branch was officially closed in 1950 and all of the facilities were taken over by USACE. Most of the buildings and trailers associated with the Yuma Test Branch were dismantled and sold at public auction. In 1951, the installation was reactivated as the Yuma Test Station and was used for desert environment testing. In 1963, the installation was placed under the command of the Army Materiel Command (AMC) and re-designated as YPG (YPG, 2012a).

3.4.3.2 Cultural Resources

For the purposes of NEPA, cultural resources include historic properties as defined under Section 106 of the NHPA as well as other culturally significant properties. Cultural resources on YPG include prehistoric sites, historic mining sites, and historic military sites and structures. Previous surveys conducted on YPG are summarized in the ICRMP (YPG, 2012a). Historic building evaluations were conducted in 1983, 1999, 2009, and 2011. As a result of these inventories, no buildings or structures on YPG are considered eligible for listing in the NRHP. There are historic mining sites within YPG but no known town sites or other notable historic settlements from this period are within the YPG boundary. The potential historic significance and NRHP eligibility of historical mining locations within the YPG boundary has not been assessed (YPG, 2012a).

3.4.3.3 Archaeology

There are 1,909 identified archaeological sites at YPG (McDonald, 2014, personal communication). Most identified archaeological sites occur on terraces and ridges, followed by a number of sites at water sources and within wash areas (YPG, 2012a). Archaeological sites typically contain scatters of artifacts indicating use by Native Americans, or features such as rock rings or trail segments. Approximately 174,098 ac, approximately 21 percent of YPG, have been surveyed for cultural resources (McDonald, 2014, personal communication). Areas on YPG within the Kofa, Cibola, and Laguna Regions that have been surveyed for cultural resources include:

- Kofa Region—southern portion and just below the East Arm and specific locations within the East Arm
- Cibola Region—east of the Chocolate Mountains
- Laguna Region—most of the area except portions of the southeast and southwest corners

Large areas of YPG that are not used for physically intrusive activities have not been surveyed for cultural resources. Due to the large size of YPG, a predictive model for probability of prehistoric archaeological resources was prepared (Bullard et al., 2011). This model can be used to prioritize survey efforts not associated with a specific project so that locations with a higher probability of containing cultural resources have a higher priority for being surveyed.

Based on previous cultural resource surveys, several potential historic districts and thematically related areas at YPG are eligible for listing in the NRHP. These include:

- White Tanks Management Area in the northern part of the East Arm of the Kofa Region consists of 46 archaeological sites within a 2,069-ac area. All of the sites contribute to an archaeological district that has been determined eligible for listing in the NRHP.
- Camp Laguna in the Laguna Region consists of the remains of General Patton's IV Armored camp along Imperial Dam Road west of US 95. Remains of the camp are found in 21 separate components. Although a formal determination has not been made, YPG and SHPO consider Camp Laguna to be eligible for the NRHP as a district.
- The Direct Fire Range in the Kofa Region near the Muggins Mountains contains 54 sites in five distinct locations within a 5,652-ac area. Each of the five locations is considered an

eligible historic district, although formal determinations have not been made. The five historic districts are the Red Bluff Pediment District, Red Bluff Basin District, Muggins Basin District, Upper Basin District, and Gila Watershed District.

- The Ammunition Storage, Handling, and Testing Facilities contain 20 sites in four distinct patterns within a 2,223-ac area. Each of the four locations is considered an eligible historic district, although formal determinations have not been made. The four historic districts are the Castle Dome Plain District, Castle Dome Wash District, 9-Alpha North District, and 9-Alpha East District.
- The Extended Combat Systems Maneuver Area contains 161 sites within a 9,902-ac area in the south-central portion of YPG. All 161 sites were determined eligible for the NRHP as thematically-related property types under a multiple property designation.
- The Red Bluff Range Combat Systems Maneuver Area contains 96 sites within a 5,434-ac area in the south-central portion of YPG. All 96 sites were determined eligible for the NRHP as thematically-related property types under a multiple property designation.
- The Mohave Tanks, Mohave Wash, and Yuma Wash areas, all located in the Cibola Region, may contain resources of sufficient significance and integrity to be eligible for listing in the NRHP as historic districts (YPG, 2012a), and include:
 - Mohave Tanks
 - Mohave Wash
 - Yuma Wash

Built Environment

Currently, no buildings or structures at YPG are listed in the NRHP, and none are considered nor have been determined eligible for the NRHP except for a collection of 26 military residences. These buildings were previously determined eligible for the NRHP, but are covered by the Program Comment for Capehart-Wherry Army residences. The only compliance measure required for them is consideration of the Neighborhood Design Guidelines that are part of the Program Comments when conducting actions that will affect Capehart-Wherry housing, and to document that consideration appropriately. There are no projects proposed under this PEIS that would affect these residences.

Tribal Resources

The White Tanks Management Area is considered a Traditional Cultural Property (TCP) by affiliated Native American tribes, and it is likely that other notable site complexes, such as Mohave Tanks, would be considered TCPs. Although YPG has sponsored ethnographic studies for some of the area tribes, no TCPs have been formally identified on YPG (McDonald, 2011 personal communication). Due to the long-standing, rich, and varied Native American history associated with the installation area, it is highly likely that some recorded archaeological sites would also be considered TCPs, and that other TCPs are present in the area.

The YPG ICRMP identifies Native American tribes with an interest at YPG and includes recommendations and guidelines for the treatment of TCPs and sacred and ceremonial sites, as well as a delineated approach to the consultation process with the identified tribes. YPG has developed a consultation plan for Native American tribes with interests in the installation lands (Tierra Environmental Services, 2001). YPG has previously undertaken

consultation with the local tribes and has begun the process for this PEIS in accordance with this plan (see Section 3.4.2).

Paleobotanical Resources

Paleontological remains and deposits, which include paleobotanical resources, are considered objects of antiquity and are protected by the Antiquities Act of 1906, the Archaeological Resources Protection Act of 1979, and Chapter 6 of AR 200-1, “Cultural Resources.” Paleobotanical resources on YPG consist of petrified wood and occur in varying abundance in the southwest corner of the Laguna Region, which is not accessible to the general public. Petrified wood occurs as fragments typically ranging in size from 10 to 16 inches and occasionally reaching 6.5 ft (DoD, 1998). The quantity of petrified wood in this area ranges from abundant to none. Remnants of plants that grew along the Colorado River during the Pliocene were deposited on YPG when the Colorado River left alluvial deposits containing petrified wood in the Laguna Region. There are also areas where paleobotanical resources may have been lost to disturbance (YPG, 2012a). Paleobotanical resources can provide information of past climate characteristics and historical vegetation makeup of the Yuma area and also could contribute to understanding of the tectonic history of the region. Paleontological resources are managed through the YPG ICRMP. YPG directs people to not disturb petrified wood, as it is illegal to remove these resources from YPG (YPG, 2012a).

3.4.4 Environmental Consequences

Development projects have the potential to disturb soil surfaces and alter viewsheds at YPG, which has the potential to impact cultural resources.

The following were evaluated to determine the potential impacts to cultural resources from the Proposed Action:

- Construction and demolition activities that could physically diminish or destroy NRHP eligible archaeological sites, or information contained therein.
- Activities such as road grading that could damage archaeological sites.
- Activities that could impact archaeological sites by introducing human interaction to remote areas.
- Activities that could impact the viewshed of a historic property by altering the feeling, setting, or association of the property or by altering the visual landscape associated with that property.
- Activities that could impact a sacred site or TCP by physically altering or diminishing it, or by disrupting the traditional use or religious activities associated with that site, or that would hinder the access of a particular group to an associated sacred site or TCP.

The impact analysis was based on the probability of disturbance to sites considered eligible for listing in the NRHP or to sites identified but not yet evaluated for eligibility for listing in the NRHP. Sites previously evaluated that were determined to be ineligible for listing in the NRHP were not considered in the analysis.

3.4.4.1 Significance Criteria

Any impact to cultural resources is potentially irreversible and any data lost could be irretrievable. The significance criteria that were used to determine potential impacts to cultural resources were:

- Minor to Moderate (less than significant) – Activities that affect known or unknown historic, prehistoric, or other cultural resources but do not alter their eligibility for listing in the NRHP.
- Minor to Moderate (less than significant) – Pedestrian activities that occur in areas known to contain paleobotanical resources.
- Severe (significant) – Activities that result in alteration of an NRHP eligible resource such that the resource would no longer be eligible for listing. Also, the loss of any NRHP eligible resource.
- Severe (significant) – Activities that include earthmoving in areas known to contain paleobotanical resources.
- Beneficial – Activities that preserve or enhance identified cultural resources.

3.4.4.2 Impacts of the No Action Alternative

Under the No Action Alternative, no change in current practices and activities at YPG would occur. There would be no new construction activities or expansion of maneuver and munitions impact areas. YPG would continue to follow the procedures stipulated in its ICRMP, which contains specific guidance for the inventory, evaluation, and management of culturally significant properties on the installation. Continued implementation of the ICRMP will ensure that the Army is compliant with applicable federal, state, and local laws regarding cultural resources. YPG will conduct Section 106 consultation as required under the NHPA regarding current projects, testing, and training activities that have the potential to affect historic properties. The Army is committed to participating in the Section 106 process, including implementation of any resulting mitigation measures.

Buried archaeological deposits may not be detected during the cultural resource survey process and may be inadvertently discovered during ground-disturbing activities. The potential for impacts to significant cultural resources identified through inadvertent discovery from current practices and activities at YPG would remain. Any inadvertent discoveries of cultural resources would be addressed through the inadvertent discovery process specified in the ICRMP. Implementation of inadvertent discovery procedures, as appropriate, would minimize the potential for impact to previously unknown cultural resources.

The YPG inadvertent discovery process requires that, in the event of discovery of previously unknown archaeological deposits, all activity would cease and the YPG Cultural Resources Manager be notified. The Cultural Resources Manager would inspect and test the archaeological deposits and determine the course of action based on the significance of the findings. The Arizona SHPO would be notified if the Cultural Resources Manager determined that the findings were of significance. Relocation of the proposed activity would be the preferred course of action if the findings are determined to be of significance. The Cultural Resources Manager would consult with the Arizona SHPO concerning documentation and mitigation if the activity cannot be relocated. The ground-disturbing activity would not resume until the inadvertent discovery process is completed (YPG, 2012a).

Considering the size of YPG, unauthorized access to portions of the installation may occur. Vandalism by unauthorized persons has the potential to impact cultural resources,

including paleobotanical resources, and would be addressed through existing policies and procedures as situations arise.

3.4.4.3 Impacts of the Proposed Action/Preferred Alternative

Some activities would occur in areas that have been previously surveyed and determined to contain no historic properties through NHPA Section 106 consultation with SHPO and Federally Recognized Tribes that consider the YPG area to be part of their ancestral lands. These activities would not impact cultural resources and would have no potential for cumulative impacts to cultural resources. The potential would exist for inadvertent discovery of cultural resources in these areas and the YPG inadvertent discovery policy and process specified in the ICRMP would be followed should this occur. Areas containing known significant cultural resources were avoided through site selection during the planning process.

Proposed activities that would occur in areas where cultural resource surveys have not been completed or where surveys have been done but NHPA Section 106 consultation is not complete would be subject to site-specific cultural resource survey and evaluation as needed, and NHPA Section 106 consultation. The YPG Cultural Resources Manager would determine whether site-specific cultural resource studies or consultation would be required prior to implementation of proposed activities in these areas, in compliance with the PA. Any cultural resource identification and consultation requirements would be completed prior to implementation of these activities. Proposed activities with potential to impact significant cultural resources, if such resources are present, include:

- Construction of buildings, test courses, DZs, landing pads, and other facilities
- Relocation and construction of roadways
- Installation of new utility infrastructure
- Off-road vehicle and equipment testing
- Munitions testing
- Establishment of TGP

A site-specific NEPA analysis would be tiered from this PEIS for any such projects that would have potential direct, indirect, and cumulative impacts to known significant cultural resources. For projects where no impacts to known significant cultural resources would result, the tiered NEPA analysis would likely be a Record of Environmental Consideration for a Categorical Exclusion, assuming all screening criteria of 32 CFR §651.29 are met. Should there be unavoidable impacts to known significant cultural resources, a focused environmental assessment could be required. The potential for activities to impact cultural resources is discussed by region below.

Vandalism by unauthorized persons would continue to have the potential to impact cultural resources, including paleobotanical resources, and would be addressed through existing policies and procedures as situations arise.

Laguna Region. Most new building construction under the Proposed Action would occur in the Laguna Region. Most proposed activities in the Laguna Region would occur in cantonment areas or other previously disturbed areas. Activities were sited through the planning process to avoid known cultural resources and to be within areas previously surveyed to the extent practicable. Munitions testing does not occur in the Laguna Region and no TGPs would be established in this region. No new off-road vehicle testing in the Laguna Region would occur under the Proposed Action. Inadvertent discovery of cultural resources could occur in these areas and the inadvertent

discovery process specified in the ICRMP and discussed in Section 3.4.6 would be followed should such discoveries occur.

Approximately 9,150 linear feet (lf) of electrical transmission and telecommunications lines would be installed in the Laguna Region. As long as these lines would be installed in existing previously disturbed rights-of-way, easements, distribution systems, or facilities, they would be considered to have no adverse effect in accordance with Attachment H of the PA. Should inadvertent discovery occur, the YPG inadvertent discovery process would be followed.

The primary potential for impacts to cultural resources would be from activities that would be implemented outside of previously surveyed areas. Activities sited outside of previously surveyed areas would not be implemented until after completion of the consultation process and any measures stipulated as a result of that consultation.

As most proposed activities in the Laguna Region would occur in cantonment areas or other previously disturbed areas, they would not likely impact paleobotanical resources. Proposed activities with potential to impact paleobotanical resources are identified in Table 3-6.

TABLE 3-6
Activities that Could Impact Paleobotanical Resources
Yuma Proving Ground

Proposed Action	Quantity and Potential Impact
L014	New construction would occur in areas where petrified wood occurs with frequencies ranging from uncommon to common but within a previously disturbed area (Comanche Flats), which would minimize the potential for impacts. Potential impacts could occur due to construction activities or from illegal removal by YPG or construction personnel.
L017	New construction would occur in areas where petrified wood occurs with frequencies ranging from uncommon to rare but within a previously disturbed area (TM Site 4), which would minimize the potential for impacts. Potential impacts could occur due to construction activities or from illegal removal by YPG or construction personnel.
L018	New construction would occur in areas where petrified wood is common but within a previously disturbed area (Sidewinder Sensor Site), which would minimize the potential for impacts. Potential impacts could occur due to construction activities or from illegal removal by YPG or construction personnel.
L019	Dismounted maneuver area expansion would occur in areas mostly where petrified wood has not been found and also in areas where petrified wood occurs with frequencies ranging from uncommon to rare. Potential impacts could result from illegal removal of the resource by personnel.
L101	New construction would occur in areas where petrified wood is abundant to none observed (area disturbed), but would be north of the LAAF vicinity, a previously disturbed area. Potential impacts could occur due to construction activities or from illegal removal by YPG or construction personnel.
L002, L003, L008, L102	New construction would occur in areas outside but near LAAF where petrified wood is abundant to none observed (area disturbed). Potential impacts could occur due to construction activities or from illegal removal by YPG or construction personnel.

Source: YPG, 2012a

Potential impacts to paleobotanical resources would likely be from minor to moderate with implementation of mitigation measures. Mitigation for paleobotanical resources would include Environmental Awareness Training for military personnel, other YPG personnel, and construction contractors who would work in areas where paleobotanical resources

occur. This training would provide instruction on the importance of these resources and the protection afforded petrified wood on YPG. Mitigation also would include siting ground-disturbing activities in areas where petrified wood does not occur to the extent practicable. The YPG inadvertent discovery process would apply to petrified wood.

Cibola Region. Activities including construction, aircraft armament testing, static detonation, conflagration testing, combat skills training, instrument DZs, and extraction zones would occur in the Cibola Region under the Proposed Action. Inadvertent discovery of cultural resources could occur in previously surveyed areas; the YPG inadvertent discovery process would be followed should such discoveries occur.

Two proposed activities in areas not previously surveyed for cultural resources would be unlikely to impact cultural resources:

- C031 – Use Site 6 as a meteorological station. No new disturbance would occur at this previously disturbed site.
- C036 – Increase use of Prospect Square for bombing or aircraft gunnery. Prospect Square is an existing impact area for inert and explosive weapons. Use would increase, but munitions impacts would be limited to land previously disturbed by these activities. Safety concerns associated with potential UXO in Prospect Square preclude additional cultural resource surveys in this area.

Effects to cultural resources from activities in the Cibola Region would be addressed through the consultation process, as stipulated in the PA.

Kofa Region. Proposed activities, including direct and indirect fire, the use of expanded range areas, and the creation of new GPs, would occur in the Kofa Region. Inadvertent discovery of cultural resources could occur in previously surveyed areas; the YPG inadvertent discovery process would be followed should such discoveries occur.

Effects to cultural resources from activities in the Kofa Region would be addressed through the consultation process, as stipulated in the PA.

Cumulative Impacts. When assessing cumulative impacts to cultural resources, regional solar energy projects were considered in addition to proposed activities on YPG. On YPG, there are areas not previously surveyed for cultural resources that would be evaluated on a project-specific basis in the future. At this time it is not known whether cumulative impacts to cultural resources would result from these activities.

The Quartzsite Solar Energy Project in La Paz County contains one cultural property that is recommended as eligible for inclusion in the NRHP that could be affected; impacts would be mitigated through avoidance and construction monitoring. Any contribution to cumulative impacts to cultural resources from the Quartzsite Solar Energy Project would be expected to be minor.

Development of this commercial-scale, renewable solar electrical energy generation facility in the southern Kofa Region could impact cultural resources, and any such impacts could interact with project activities analyzed in this FPEIS that impact cultural resources, resulting in cumulative effects. However, compliance with Section 106 of the NHPA and implementation of appropriate mitigation developed through the consultation process would likely prevent significant cumulative impacts to these resources.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to regional cultural resources. At this time, cultural resources in the project areas are unknown and the potential for cumulative impacts to this resource area cannot be assessed accurately. However, it is expected that BLM will require that these projects conduct appropriate investigations and consultation with SHPO regarding cultural resources to ensure that these resources are not negatively impacted or to develop and implement appropriate mitigation for unavoidable impacts that would Reduce impacts to less than significant and minimize the potential for cumulative impacts.

3.4.4.4 Avoidance, Minimization, and Mitigation

The YPG ICRMP recommends how YPG can mitigate impacts to historic properties through avoidance, physical protection, data recovery, or other mitigation measures (YPG, 2012a). The following are measures for the protection and mitigation of prehistoric and historic archaeological sites.

- Avoidance of areas having significant sites is the preferred and most effective way to protect NRHP eligible sites. Coordination of mission activity planning and cultural resource management can be useful in determining where significant sites exist and where to move or adjust the activities so that significant sites are avoided.
- Physical protection of individual sites by fencing, berming, or taking other protective measures to make them inaccessible during construction or project implementation may be necessary to protect archaeological sites. This can be accomplished by placing temporary fencing or berming around site boundaries or marking site boundaries with flagging or stakes, in combination with written, graphic, and verbal instructions for avoidance.
- When the protection of a cultural resource is not feasible, then data recovery may be performed to mitigate for a loss of site integrity and information potential. A data recovery plan would be structured to present a representative sample of the data that established the significance of the site. Data recovery would be in compliance with federal standards (36 CFR Part 66; 48 FR 44734-44737).

Specifically for paleobotanical resources, YPG would:

- Conduct Environmental Awareness Training for military personnel, other YPG personnel, and construction contractors who would work in areas where paleobotanical resources occur to instruct on the importance of these resources and the protection afforded petrified wood on YPG
- Site ground-disturbing activities in areas where petrified wood does not occur to the extent practicable.
- Apply the YPG inadvertent discovery process to discovery of petrified wood.

The U.S. Army YPG has determined that implementation of projects in this FPEIS would impact cultural resources at YPG. A Section 106 PA was developed, in consultation with SHPO, ACHP, and interested tribes, which establishes areas at YPG requiring no additional cultural resources survey and establishes the types of projects that have been determined to have no effects or no adverse effects on historic properties. These project types will not require mitigation. Other project types will require further analysis and consultation.

Some proposed activities would have no potential to impact cultural resources. These activities either used the planning process to avoid impacts to cultural resources or by chance were sited in areas where known cultural resources do not occur. No further mitigation, beyond avoidance of known cultural resources, would be required for these activities.

There are some proposed activities for which the potential to impact cultural resources is unknown, either because the location for the activity is not known at this time or because the proposed location is within an area where cultural resource surveys have not been conducted or where consultation with the Arizona SHPO regarding the potential eligibility of identified cultural resources has not been completed. These projects would be evaluated prior to implementation, in compliance with the PA. If necessary, cultural resource surveys of the proposed project area would be completed.

Should consultation determine that significant cultural resources occur within a proposed project area, YPG would first attempt to modify the project design to avoid or protect the identified resources. For activities where avoidance or protection of cultural resources would not be possible, YPG would consult with the SHPO, ACHP, and tribes as specified in the PA. Mitigation measures to protect paleobotanical resources on YPG would include Environmental Awareness Training for military personnel conducting dismounted maneuvers and for other persons working in areas where paleobotanical resources could occur. The site selection process would give consideration to avoiding locations of known paleobotanical resources. Where unavoidable impacts to paleobotanical resources would result from an activity, data recovery would be implemented. The inadvertent discovery process also would be applied should construction activities result in discovery of these resources.

3.5 Energy/Utilities

3.5.1 Existing Conditions

Most human activity and utility use is concentrated in cantonments, which make up approximately 0.2 percent of the YPG land area. Utility infrastructure is concentrated in those areas of heavy use. Water, electricity, telecommunications, and wastewater services are generally limited to cantonments and the immediate vicinity, although some down-range areas are equipped with water wells, electricity, and telecommunications. The majority of YPG has no utility services; water is typically trucked to remote testing and training sites, and power is provided by portable generators.

Privatization of utilities on YPG is scheduled to be completed in 2018-2020. Private firms would then be responsible for managing, controlling, and performing operations, maintenance, repairs, replacements, and upgrades for all utilities and associated infrastructure as needed.

3.5.1.1 Energy/Electricity

YPG receives electricity from four sources, with the Western Area Power Administration (WAPA) being the primary provider. WAPA provides power from hydroelectric stations on the Colorado River and from Davis and Parker Dams (Gutierrez Canales Engineering, P.C., 2011). The Wellton-Mohawk Drainage District manages the electricity supply from the WAPA (Parsons, 2008). The Wellton-Mohawk Drainage District is the secondary power

supplier. The Arizona Public Service Company also supplies power through two small delivery points (Skaggs, 2013, personal communication).

Low voltage power (480 volts and less) on YPG is provided from a variety of delivery points, but is primarily routed from the Kofa Region 161-kilovolt (kV) transmission substation to the rest of YPG through 69-kV, 34.5-kV, and 12.47-kV transmission lines and a series of substations. The low voltage system is supplied by overhead and pad-mounted distribution transformers connected to the high voltage system. Some substations may require upgrades or modifications to meet future needs, while others are underutilized and capable of supplementing areas nearing capacity or experiencing increased demand.

YPG has three operational solar arrays to augment electrical power supply. Two of the solar arrays, a 143.75kV system and a 95kV system, are in the YTC area and a 44kV system is in the northern part of Cibola. In addition, there are two other solar array systems on YPG that are not operational. A 600kV system at the MAA is off-line due to storm damage. A 131.25-kV solar field was constructed and operated historically in the Kofa Region but is no longer operational. YPG is investigating placing these systems back in operation (Skaggs, 2013, personal communication). YPG has 35 standby power generators for emergency power as needed (Brandon, 2011a, personal communication).

Many remote and down-range testing and training areas are not wired for electrical power from the existing transmission system. Non-road engine generators and stationary generators are used in these areas when power is needed to support activities.

3.5.1.2 Water

Drinking water quality at YPG conforms to the Federal criteria pursuant to the Safe Drinking Water Act (SDWA), as amended, and by State of Arizona or local regulations. The ADEQ has primacy for drinking water regulation enforcement under AAC Title 18, *Environmental Quality*, Chapter 4, *Department of Environmental Quality, Safe Drinking Water* (AAC R18-4); however, all federal regulation (40 CFR Part 141 & 142) is reviewed to ensure full compliance.

Much of the groundwater on YPG contains levels of fluoride, and arsenic above the national drinking water standards. Naturally occurring arsenic has been detected at levels averaging 18 to 29 ppb in YPG groundwater. In 2006, the USEPA lowered the maximum contaminant level for arsenic from 50 to 10 ppb, which resulted in a notice of violation issued by USEPA for three of YPG's Public Water Systems. To meet the new federal standard for public drinking water supply, YPG completed construction of two new water treatment facilities in 2011. All Public Water Systems on YPG currently meet Federal primary drinking water standards (Obregon, 2013b, personal communication).

Yuma Proving Ground currently has three Public Water Systems (as defined by 40 CFR 141.2). The three water systems on YPG are the MAA, KFR, and YTC cantonment areas. The MAA is unique in that it has a dual parallel system (potable and non-potable) and it is classified as a "community water system". The MAA is the only community water system on YPG (Obregon, 2013b, personal communication). The KFR water supply system also provides water to CDH and CDA via a pipe system.

YPG has other smaller water systems that are not regulated by the SDWA provisions because they do not qualify as Public Water Systems. Other areas on YPG, including the Dynamometer building, Sites 4 & 4E, Cobra Flats, and other down range sites that are

equipped with piped water are not supplied by the new water treatment facilities and continue to be supplied by existing wells (Obregon, 2013b, personal communication). Developed areas outside of cantonment areas typically use bottled water for potable purposes. Drinking water either bottled or in bulk amounts, is delivered to remote areas lacking water treatment capabilities or water distribution under contract with local vendors (Parsons, 2011).

Three water treatment facilities, one for public water systems, produce potable water for the main cantonment areas (Obregon, 2013b, personal communication). Each of these treatment facilities uses electrodialysis reversal treatment technology to produce potable water. The MAA water treatment facility is supplied by two primary wells that draw from the Colorado River aquifer and a and a back-up well that draws from the same aquifer, with a combined capacity of 6.61 million gallons per day and operates at 33 percent capacity on average, with peak demand during August, rising to 46 percent capacity. The water treatment plant (WTP) serving the YTC and LAAF cantonment areas can produce up to 72,000 gallons per day (gpd) and the Kofa cantonment plant, which also serves CDH and CDA, can produce up to 144,000 gpd. Potable water is distributed primarily through cast iron pipes, and the systems include a series of storage tanks to aid distribution (Parsons, 2011).

Water distribution systems are tested regularly in compliance with Arizona Drinking Water Regulations, the Safe Drinking Water Act of 1974, and corresponding National Primary Drinking Water Regulations (40 CFR 141 & 142). The classification of each water system dictates a specific set of parameters (contaminants) and frequencies at which they need to be monitored. Testing is done monthly, quarterly, semi-annual, annually, and some are done on a 3-year cycle depending on regulatory requirements (Obregon, 2013b, personal communication).

Non-potable water is mainly used for irrigation, cooling, dust suppression, and restrooms (Parsons, 2011). Non-potable water also is used for fire suppression, if excess water is available at the time of a fire.

Occasional operational training is conducted in Training Area Bravo with water purification systems. Marine support squads train using transportable RO systems in Training Area Bravo to purify water withdrawn from the Gila Gravity Main Canal under a permit issued to YPG. Brine from the purification process is released in the fording basin, where it evaporates.

YPG has complied with EOs 13423 and 13514, which targeted reduction of water use and introduction of water reuse initiatives. These EOs were revoked by EO 13693, *Planning for Federal Sustainability in the Next Decade*. This 2015 EO, however, also requires federal agencies to improve water use efficiency and management, including stormwater management by reducing agency potable water consumption; installing water meters and collecting and utilizing building and facility water balance data to improve water conservation and management; reducing agency industrial, landscaping, and agricultural water consumption; and installing appropriate green infrastructure features to help with stormwater and wastewater management. To help meet these requirements, water usage by all on-post customers is metered and is charged based on use. In support of the Army's Net Zero program, water conservation measures that have been implemented on YPG include:

- Replacement of standard plumbing fixtures with low-flow, dual-flow, and waterless fixtures
- Conversion of formerly irrigated landscaping to xeriscaping
- Requirement for use of xeriscaping in all new landscaping
- Requirement for use of untreated well water for construction and dust suppression, which also results in elimination of 5 percent of the total lost water in treatment and back-flushing processes

3.5.1.3 Telecommunications

YPG uses an information transfer system, which includes 600 miles of fiber optic cable, with four main connecting points. The bandwidth typical of this system is 1 gigabyte per second. Voice and data connectivity systems function well at YTC, the Kofa cantonment, CDH, and CDA, but service in the MAA can be unreliable (Parsons, 2011). Remote locations, such as test areas and GPs, typically are not connected to the data network and must use satellite uplinks powered by portable generators to relay data to YTC and the Kofa cantonments for analysis.

A total of 57 registered radio and cell towers are in Yuma County, mostly in the City of Yuma or along U.S. Interstate 8 (I-8) (Homefacts.com, 2011a). Nineteen towers are in La Paz County, 13 of which are found in Quartzsite, Arizona (Homefacts.com, 2011b). One cell tower is located on Hill 630 within the YPG boundary.

3.5.1.4 Wastewater

There is no centralized treatment of wastewater on YPG. Wastewater disposal systems on YPG consist of individual septic systems, chemical toilets, and localized collection systems served by evaporative lagoon systems (Parsons, 2008). There are 23 active evaporative lagoon cells, 8 lift stations, and 38 individual septic systems (Parsons, 2011). The number of wastewater disposal systems will likely change in the future but specific designs for additional wastewater disposal systems have not been developed and are not included in this analysis (Brian Hoon, 2013, personal communication). Evaporative lagoons are used at MAA, YTC, LAAF, and the Kofa cantonment.

Wastewater on YPG is managed by a no-discharge process permitted by ADEQ aquifer protection permits, with final disposal through septic system leach fields or through lagoon evaporation. Industrial stormwater discharge is authorized by the Arizona Pollutant Discharge Elimination System Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity from Non-Mining Facilities to Waters of the U.S. (AZMSGP2010-002).

Localized wastewater collection systems typically are gravity fed, with pump stations where needed. Collection systems consist of vitrified clay pipes, asbestos cement pipe, and polyvinyl chloride (PVC) pipes. Sewer systems receive domestic sewage from connected sources and minor industrial discharge such as, brine from potable WTPs, vehicle wash water after it passes through oil water separators, and water from air conditioning units. Sewage lagoon cells are inspected and operated by certified wastewater operators and typically operate below capacity. The wastewater system in the Kofa cantonment is close to capacity during peak usage periods and is approaching capacity for average use (Brian

Hoon, 2013, personal communication). Plans are in place to expand the Kofa cantonment sewer system.

Wastewater treatment at CDH consists of one un-lined evaporative lagoon with a capacity of 7,000 gpd. Wastewater data for the CDH area are not available, although no concerns have been identified for this area (Parsons, 2011). Septic systems or chemical toilets are used for domestic wastewater treatment at CDA and in other remote areas and other areas lacking evaporative lagoon systems. Septic tanks and chemical toilets are maintained regularly to assure proper functioning (YPG, 2012b).

3.5.1.5 Non-Hazardous Solid Waste

YPG has a non-hazardous solid waste landfill permitted under an Arizona Aquifer Protection permit that accepts household waste, vegetative waste, dried sewage sludge, and inert material such as brick, rock, gravel, and sand. The landfill can accept up to 20 tons per day, averaged annually and no more than 10 percent of its daily volume can be vegetative waste. Construction and demolition (C&D) waste is sent to commercial landfills. As part of the housing privatization in 2009, any municipal waste from housing is taken to an off-post landfill. The current non-hazardous waste landfill is tentatively scheduled for closure in 2020. An extension may be requested from ADEQ if the landfill has not reached capacity by 2020 (Jason Associates Corporation and North Wind Environmental, 2000).

3.5.2 Environmental Consequences

The following were evaluated to determine potential impacts to energy and utilities:

- Change in energy demand resulting from construction and operation of proposed activities, from fluctuations in testing or training, or from testing or training in new areas.
- Change in water/wastewater demand resulting from construction and operation of proposed activities, from fluctuations in testing or training, or from testing or training in new areas.
- Increased landfill demand resulting from construction and demolition activities.

3.5.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to energy and utilities include:

- Negligible (less than significant) – Activities that have barely perceptible impacts on local and regional energy, water, landfill, and sewer service demand.
- Minor to Moderate (less than significant) – Activities that would have noticeable impacts on local and regional energy, water, landfill, and sewer service demand
- Minor to Moderate (less than significant) – Activities that would result in increased groundwater consumption but that would not deplete groundwater resources.
- Severe (significant) – Groundwater is depleted to the degree that subsidence causes fissures to form.
- Severe (significant) – Activities that would create energy, water, landfill, or sewer service demand in excess of existing supply or capacity

- Beneficial — Activities that would result in a reduction of demand for energy, water, landfill, or sewer services

3.5.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, testing and training activities would continue to fluctuate between historical high and low levels and no new construction would occur. No remote locations would receive utility extensions, and use of portable generators for power and satellite uplinks for telecommunications/data transfer would continue at current levels. Consumptive water use on YPG would be expected to decrease through continued implementation of water conservation measures. Remote areas would continue to be supplied by bottled water trucked in under contract with local vendors. The wastewater system in the Kofa cantonment would continue to be undersized to meet the needs of that area until the sewer system is expanded as planned. The non-hazardous solid waste landfill would continue to be used until it is closed, which is tentatively scheduled for 2020 (Jason Associates Corporation and North Wind Environmental, 2000). Under the No Action Alternative, no significant increase in non-hazardous waste is anticipated. No significant impacts to the non-hazardous landfill capacity are anticipated.

The continued use of portable generators at current levels would be less efficient than installation of hard power to many areas. Considering the cost of transport of a generator and its fuel, portable generators are less efficient compared to large power sources that provide electricity to the power grid and also contribute greater amounts of air pollution per unit of power produced than permanent sources (U.S. Congress Office of Technology Assessment, 1993). Air emissions from use of portable generators would remain unchanged under the No Action Alternative. In addition, there would be continued emissions from vehicles used to transport fuel to the remote generators during testing events. The potential for impacts to air quality from continued use of portable generators at current levels is discussed further in Section 3.2. There would be no beneficial impacts associated with installation of hard power under the No Action Alternative.

The cell and radio towers located on or near YPG have the potential to cause interference with sensor testing and communication. Ongoing activities at YPG would continue to be sited to avoid interference from the towers. There would be potential for scheduling conflicts when multiple users need to use areas free of electromagnetic interference at the same time. No additional impacts are expected to occur.

Other beneficial impacts associated with utility improvements would not occur under the No Action Alternative.

3.5.2.3 Impacts of the Proposed Action/Preferred Alternative

The Proposed Action includes training and testing activities that would occur under the No Action Alternative, an increase in training and testing capabilities, and new construction.

There would be yearly fluctuations in the frequency, intensity, or duration of training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically. Additional personnel would not be expected to train on YPG and there would be no increase in permanent staff assigned to YPG. There would be no change in demand for utilities as a result of the increased testing and training capabilities.

Construction of new facilities to replace existing structures would result in a net reduction in energy demand because the new buildings would be more energy-efficient than the older structures that would be replaced. Where new structures would be built to provide new services rather than replacing an existing structure, the increased energy demand of the new building would be less than the demand of a comparably sized older structure due to the efficient designs that would be required. Because much of the new construction would provide new services rather than replacement, a net increase in energy demand would be expected. Because of the efficient design requirements, the impact on regional utility use would be minor to moderate and within the capacity of the existing infrastructure.

While there would be yearly fluctuations in energy demand as a result of year-specific testing and training levels, it is expected that energy consumption in years with greater levels of testing and training would be within the historical annual fluctuations in energy consumption. Energy conservation measures that would be implemented under the Proposed Action that are discussed below, such as installation of solar-powered lights at many down-range testing and training locations, would help to minimize increased demand on energy utilities during years with higher levels of testing and training.

Increased use of lighter-than-air UASs, rather than conventional UASs, would result in reduced energy needs to operate the equipment being tested. YPG would be testing alternative fuel and hybrid vehicles/equipment in the future, and this could result in decreased energy demand for some tests. Because this type of equipment has not previously

TABLE 3-7
Proposed Activities that Would Result in Utility Improvements
Yuma Proving Ground

C004-b	C005-b	C007-b	C008-b
C012-b	C013-b	C014-b	C017-b
C020-b	C021-e	C023-d	C024-b
C025-b	C026-c	C029-b	C030-b
C033-b	C040	C048	C050-b
K004-b	K005	K007-b	K009
K012-b	K023	K025-b	K029
K031	L001-b	L002-b	L013-b
L014-c	L015-b	L016-b	L104

been tested on YPG, actual energy demand is not known. The increased demand is expected to be within the capacity of existing energy supplies, particularly when coupled with other energy/utility activities discussed below that would result in reduced demand for energy on YPG. The overall effect is expected to be a small net increase in demand, which would be a minor impact to energy use in the region.

Energy/utility construction improvements would result from certain proposed activities (Table 3-7).

Installation of solar-powered lights would reduce the demand for energy derived from fossil fuels that now is provided by portable generators on an as-needed basis. This action would result in a small decrease in demand and a minor benefit to regional utilities.

Approximately 9,150 lf of electrical transmission lines would be installed in the Laguna Region. Approximately 2,050 lf of transmission line would be installed down-range in the Kofa Region. The Cibola Region would see the largest increase in access to electrical power to remote test locations, with approximately 213,000 lf of new lines. The installation of hard power to multiple locations across YPG would reduce the use of portable generators.

Because power from the grid would be produced more efficiently than power from portable generators, there would be a reduction in energy consumption during testing once these areas receive electrical power via transmission lines. There also would be a reduction in energy used to transport generators and fuel to test locations. Replacement of portable generators with grid-supplied power would reduce demand and would be a moderate benefit to energy consumption in the region. A long-term cumulative benefit to air quality (Section 3.2) would be expected from this action due to the reduction in emissions.

The installation of fiber and telecommunication service to remote locations and other areas across YPG would further reduce the use of portable generators to power satellite uplinks or data transfer and communications. The benefits to energy use would be similar to those described for installation of hard power. Any indirect cumulative benefits to air quality would be similar to those described for hard power.

Proposed activity L002 is the only proposed transportation activity that would result in impacts to utilities. It will be necessary to relocate utility lines to accommodate the extension of Runway 18/36 at LAAF and the realignment of Barranca Road. Approximately 12,500 ft² of existing utilities would be relocated. This would be a minor temporary impact on utilities on YPG during the relocation.

The reduction in the use of portable generators would reduce the need to transport fuel for operation of generators to the areas receiving hard power and telecommunications service. This would reduce the use of vehicles to transport fuel, with associated reductions in fuel consumption and air emissions. As a result, the elimination of transporting fuel to these sites would indirectly benefit regional energy use and provide beneficial cumulative impacts to air quality. In addition, there would be reduced potential for petroleum spills, either from transport accidents or from refueling spills. This would be an indirect beneficial impact with regard to hazardous material by reducing the potential for a release of petroleum products to the environment. See Section 3.9 for more information.

While there would be yearly fluctuations in water demand as a result of year-specific testing and training levels, consumptive water use on YPG would be expected to decrease through time as a result of continued implementation of water conservation measures.

The proposed WTP for CDH, which also would serve CDA, would not result in an increased demand for groundwater, as this area is already supplied by groundwater sources via the KFR WTP. Source water would be supplied by Well M, an existing well, and demand on this specific well would increase. However, the increased demand on Well M would be offset by a reduction in the current demands on Well H and Well J, resulting in no net change in demand from that aquifer. Any impacts to groundwater would be negligible.

See Section 3.20 for additional information. Subsidence would not be expected and no surface fissures would result.

The proposed evaporative lagoon for wastewater disposal at CDH would replace an outdated system and provide increased capacity. This evaporative lagoon would provide benefits to wastewater utilities compared to the existing system.

The proposed sewage lagoon for the Kofa Sewage Lagoon Expansion would provide increased capacity and treatment quality and would provide benefits to wastewater utilities compared to the existing system.

Sewer services are proposed for a few remote locations on YPG and would slightly reduce the use of septic or portable wastewater systems. The number of remote locations proposed for sewer connections is minimal and any change in the use of septic or portable wastewater systems in remote areas of YPG would be negligible.

Several areas remote from existing telecommunications infrastructure and associated electromagnetic interference would be established for use in testing activities. As a result of the new testing areas without electromagnetic interference, YPG would have greater flexibility to avoid conflicts when scheduling multiple users for these areas, which would benefit the mission of YPG.

Construction and operation of an East Kofa Operations Center (K025 a and (b) would include a small building complex, perimeter fencing, vehicle maintenance area, storage areas, tactical vehicle wash rack, 40-ton crane, and all utilities. No utilities are available at this site, so the facility would represent a new demand on these resources. Water would be addressed onsite through construction, operation, and maintenance of a water well. Wastewater would be addressed through an onsite treatment facility and septic system. Electrical power and telecommunications would require new infrastructure through placement of new transmission lines (1,370 ft² for utilities and 170 lf for electrical and telecommunication lines). The new demands would not overly burden utility services on YPG or in the surrounding area.

The proposed location of Project K030 (UAS launch/recovery system and multiple buildings) in the northern portion of the East Arm has no utility service. Electrical power would have to be provided by generators or through onsite production by solar, wind, or geothermal methods. No potable water or water treatment would be available. Water would have to be shipped in or a well system installed. Wastewater treatment would have to be provided through an onsite septic system. Construction wastes and solid wastes generated onsite during operation would have to be hauled away for appropriate disposal or incinerated onsite.

The proposed construction and demolition activities would temporarily increase the quantities of waste disposed. All C&D waste is taken off-post for disposal at one of two landfills in Yuma County that accept C&D waste. C&D waste resulting from the Proposed Action would not substantially alter the projected useful life of these landfills. It is not anticipated that implementation of the Proposed Action would impact the non-hazardous waste landfill located at YPG. The non-hazardous solid waste landfill would continue to be used until it is closed, which is tentatively scheduled for 2020 (Jason Associates Corporation and North Wind Environmental, 2000). The Proposed Action would not significantly alter or

increase the waste stream currently being accepted by this facility. No significant impacts to the non-hazardous waste landfill capacity are anticipated as a result of the Proposed Action.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Electrical power would be generated to reduce YPG's demand on electricity generated from fossil fuels and for commercial supply. Usage of renewable energy from the EUL would aid YPG in complying with the following Federal renewable energy targets:

- Energy Policy Act of 2005. Requires that Federal agencies have at least 7.5 percent of their electricity provided by renewable energy by 2013 and thereafter. The Act also allows for "double credit" for renewable energy produced onsite or on Federal lands.
- EO 13693 requires federal agencies to ensure that the percentage of the total amount of building electric energy consumed by the agency that is renewable electric energy is not less than 10 percent in fiscal years 2016 and 2017, and increasing to not less than 30 percent by fiscal year 2025.
- Energy Independence and Security Act of 2007. Sets a goal that 25 percent of electricity consumed in the U.S. should come from renewable resources by 2025.
- National Defense Authorization Act of 2007. Mandates that 25 percent of electricity consumed by the DoD be from renewable resources by 2025.

It is likely that any such project would result in beneficial cumulative impacts to energy and utilities by providing increased renewable energy sources in the region.

Several current or reasonably foreseeable energy projects are proposed in the YPG area and may result in cumulative impacts. The Quartzsite Solar Energy Project (affiliated with WAPA) would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. An EIS has been completed for that project. There are five other proposed solar projects on BLM lands within approximately 10 miles of YPG, but the sizes of these projects are unknown at this time. Arizona Public Service proposes to construct a 500-kV transmission line in 2014 that would extend from Palo Verde to Yuma and would be generally parallel and adjacent to an existing transmission line. These proposed projects would be expected to result in increased demand for water for construction, cleaning, and operation, which could cause cumulative impacts on water utilities from incremental increased consumption. In addition, these projects also would result in reduced demand for fossil fuels to generate electrical power, which would result in beneficial impacts to energy supply and usage in the region.

YPG has one reasonably foreseeable project in the Kofa Region, as plans are in place to expand the Kofa cantonment sewer system. The Secure Border Initiative has reasonably foreseeable future projects involving the construction of communication towers at various locations along the U.S. and Mexico border. The communication towers would have the potential to cause interference with sensor testing and communication at YPG that would occur in the vicinity of any new communications towers. The proposed activities at YPG would be more than 15 miles from these

towers and impacts would likely be negligible. No other energy or utility cumulative impacts are expected.

3.5.2.4 Mitigation

YPG will incorporate energy-efficient design into new buildings and use solar lights where practicable. YPG also will recycle/reuse to the extent practicable to reduce waste generation. Because no significant impact to energy or utilities would occur, no additional mitigation measures are proposed for this resource area beyond the design measures that would be incorporated to comply with the Federal renewable energy targets.

3.6 Environmental Justice and Protection of Children

3.6.1 Existing Conditions

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, is designed to ensure fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, tribal, and local programs and policies. Disproportionate impacts are defined as affecting a meaningfully greater population.

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, was issued in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children, and to ensure that federal agency policies, programs, activities, and standards address environmental risks and safety risks to children. These risks are defined as “risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest.”

Yuma County and the City of Yuma exhibit similar racial profiles, with 60 percent and 55 percent of residents, respectively, indicating Hispanic or Latino heritage, which is over 25 percent higher than the State of Arizona (Table 3-8). La Paz County has a percentage of residents of Hispanic and Latino heritage similar to that of Arizona, but is 13 percent Native American, a substantially larger percentage than Yuma County or Arizona.

TABLE 3-8
2010 Census Racial Data by Area
Yuma Proving Ground

Race	Location (Population)				
	City of Yuma, AZ (77,515)	Yuma County, AZ (160,026)	La Paz County, AZ (19,715)	State of Arizona (5,130,632)	United States (281,421,906)
White Alone	69%	70%	70%	73%	72%
Black or African American Alone	3%	2%	1%	4%	13%
Native American Indian or Alaska Native Alone	2%	2%	13%	5%	1%

TABLE 3-8
2010 Census Racial Data by Area
Yuma Proving Ground

Race	Location (Population)				
	City of Yuma, AZ (77,515)	Yuma County, AZ (160,026)	La Paz County, AZ (19,715)	State of Arizona (5,130,632)	United States (281,421,906)
Asian Alone	2%	4%	5%	3%	0%
Native Hawaiian or Other Pacific Islander Alone	0%	0%	0%	0%	0%
Other Race Alone	20%	21%	13%	12%	6%
Two or More Races	5%	4%	4%	3%	3%
Latino ^a or Hispanic	55%	60%	24%	30%	16%

Source: U.S. Census Bureau (USCB), 2011a

^a Hispanic: The 2010 Census included a category for Hispanic or Latino for individuals who classify themselves in one of the specific Hispanic or Latino categories such as "Mexican," "Puerto Rican," or "Cuban," as well as those who indicate that they are "other Spanish, Hispanic, or Latino." Origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before arrival in the U.S. People who identify their origin as Spanish, Hispanic, or Latino may be of any race. Totals may not add up to 100%.

The percentage of individuals living in poverty in Yuma County and La Paz County are similar and approximately 6 percent and 3 percent higher than in Arizona, respectively. The City of Yuma has 3 percent fewer individuals living in poverty than Yuma County and 3 percent more than Arizona (Table 3-9).

TABLE 3-9
2010 Census Percentage of Children and Individuals Living Below Poverty Level
Yuma Proving Ground

	Yuma City, Arizona	Yuma County, Arizona	La Paz County, Arizona	Arizona	United States
Children Under 18^a	28%	28%	18%	25%	24%
Population Living Below Poverty Level ^b	19%	22%	19%	16%	14%

Sources:

^a USCB, 2011a;

^b USCB, 2011b

In 2010, Yuma County had a Native American population of 3,056 and there were 2,628 Native Americans dwelling in La Paz County (USCB, 2011a). The Cocopah Indian Reservation and the Fort Yuma Indian Reservation are in the vicinity of the City of Yuma. The Colorado River Indian Reservation is approximately 32 miles north of YPG near the city of Parker (University of Arizona, 2011).

The Cocopah Indian Reservation covers 9.4 square miles adjacent to the Colorado River and has a population of 817 with 880 enrolled members (USCB, 2011a; University of Arizona,

2011). Agriculture, supported by irrigation from the Colorado River, is an important component of the Cocopah community economy (University of Arizona, 2011). Other businesses on the Cocopah Indian Reservation include a convenience store, a gas station, and a smoke shop, a museum, two golf courses, a casino, and a recreational vehicle (RV) park (Inter Tribal Council of Arizona, 2011a; Cocopah Indian Tribe, 2011).

The Fort Yuma Indian Reservation is home to the Quechan Indians and covers 68.1 square miles along the Colorado River in Arizona and California. The Fort Yuma Indian Reservation had a population of 2,197 in 2010 and currently has 2,668 enrolled tribal members in Arizona and California (USCB, 2011a; University of Arizona, 2011). The Tribe is mainly an agricultural community, but also relies on tourism and a sand and gravel operation to support its economy. To support tourism, the Fort Yuma Indian Reservation has five trailer and RV parks, a small grocery store, a bingo hall with plans for a new casino, a utility company, a fish and game department, and a museum (University of Arizona, 2011; Inter Tribal Council of Arizona, 2011b).

The Colorado River Indian Reservation covers 420 square miles in La Paz County, Arizona and San Bernardino and Riverside Counties in California, with 80 percent of the Reservation in Arizona. The Reservation has a population of 8,764, with 3,389 enrolled members (USCB, 2011a; University of Arizona, 2011). The economy of the Reservation includes agriculture, recreation, light industry, casino, and government. The Tribes have senior water rights to 717,000 acre-feet of the Colorado River and produce cotton, alfalfa, wheat, feed grains, lettuce, and melons (University of Arizona, 2011; Inter Tribal Council of Arizona, 2011c).

The percentages of children in the City of Yuma, Yuma County, and Arizona are similar. The percentage of children in La Paz County is 10 percent less than in Yuma County and 7 percent less than in Arizona as a whole. There is no disproportionate number of children in Yuma or La Paz Counties when compared to Arizona (Table 3-9).

3.6.2 Environmental Consequences

Because there would be no potential for impacts to this resource area, the discussion of impacts is abbreviated and significance criteria and proposed mitigation are not provided.

3.6.2.1 Impacts of the No Action Alternative

There would be no change to existing conditions under the No Action Alternative. As a result, there would be no potential for direct, indirect, or cumulative negative impacts to environmental justice or protection of children.

There would be no short-term beneficial impacts to the local economy as a result of construction jobs and purchase of building materials.

3.6.2.2 Impacts of the Proposed Action/Preferred Alternative

All of the activities that would be implemented under the Proposed Action would be confined within the YPG boundaries and there would be no adverse impacts to minority or low-income populations living outside the installation. There may be minor short-term beneficial impacts to these communities because the construction workforce for building and demolition projects would likely be drawn from the local community and because of indirect induced benefit to the local economy. Implementation of the Proposed Action would not disproportionately impact minority and low-income populations and there would be no environmental justice impacts.

Children are not allowed within the testing and training areas of YPG. Implementation of the Proposed Action would not create any environmental health or safety issue for children. There would be no potential for direct, indirect, or cumulative negative impacts to environmental justice or protection of children.

3.6.2.3 Mitigation

There would be no impacts to environmental justice populations and no environmental health or safety risks to children would be created. Because no impacts would occur, no mitigation is proposed for this resource area.

3.7 Fire Management

3.7.1 Existing Conditions

Fire is a potentially disruptive force on both the environment and the military mission on YPG. The installation implements fire management to minimize the potential for environmental or mission effects. YPG Regulation (YPGR) 420-1 and AR 520-90 (Fire Prevention and Protection) are implemented to provide fire safety on the installation.

Native vegetation of the Sonoran Desert is not well-adapted to wildfire. Typical presettlement wildfires in the southwestern deserts were of low intensity and confined to small areas. Post-fire recovery of vegetation in the creosote bush-bursage community typical of much of YPG is a long process and may require 100 years (Brown and Smith, 2000). With the increase in fuel load associated with invasive vegetation growth, the intensity and magnitude of desert fires have increased, potentially altering desert ecosystems at multiple levels (soil microflora, soil crusts, and vegetation) (Neary et al., 2005). The desert ecosystem can be permanently changed by frequent or intense fires. Impacts from fires on long-lived species, such as the saguaro cactus and the Sonoran desert tortoise (*Gopherus morafkai*), are generally considered catastrophic.

Wildfires on YPG result from natural causes, such as lightning, as well as military activities, with ignition a by-product of testing or training activities. The potential for major fires is a function of the short-term climate. When conditions are normal or dry for a period of years, the fuel load is low and disconnected due to sparse vegetation and plant-free gaps. Under these conditions, it is difficult for a wildfire to grow and spread. When conditions are wetter than normal, invasive Mediterranean grass (*Schismus barbatus*), buffelgrass (*Pennisetum ciliare*), Sahara mustard (*Brassica tournefortii*), and native annual desert vegetation may fill bare areas between perennial vegetation, resulting in increased fuel loads and greater potential for wildfire to spread (Sonoran Desert Museum, 2011; YPG, 2012b). Other invasive vegetation, such as tamarisk, creates increased fuel loads along roads and other disturbed soil where water can pool, such as in borrow pits, and contributes to wildfire spread.

Wildfire risk is not uniform across YPG, but rather varies in response to localized precipitation, vegetation growth, and site-specific humidity and moisture conditions. YPG has developed a GIS model to predict fire risk and behavior based on fuel loads and short-term climatic conditions (Kaya Associates, Inc., 2012). The model uses prior year rainfall and vegetation growth to predict fuel loads and then calculates area-specific fire risk based on fuel load and short-term climatic conditions. This model is used to identify range safety risks associated with wildfire. Data used to develop the model indicate how fuel load can vary based on precipitation. Figure 3-2 shows a comparison of fuel loads in an area of YPG

following a typical normal precipitation year (1998) and following a very wet year (2005) for one area on YPG.

In 2005, the mass of annual plants increased substantially in response to above normal precipitation, resulting in elevated fuel loads over some portions of YPG. Even in above normal precipitation years, rainfall on YPG is not evenly distributed, resulting in a mosaic of elevated fuel load areas and moderate or lower fuel load areas. If a fire ignites in an area with increased fuel load, the mass of dried herbaceous vegetation can carry the fire among the more widely scattered woody vegetation, resulting in rapid spread of the wildfire. Because the fire risk is tied to dried remains of herbaceous plants, areas with elevated fuel loads that do not ignite exhibit fuel load reductions as this plant material degrades and is dispersed.

Wildfires on YPG also may spread and affect Kofa NWR. In early October 2005, following a very wet year with extensive growth of the native annual woolly plantain (*Plantago ovata*) and exotic annual species, a wildfire that originated on YPG burned more than 30,000 ac, including approximately 26,000 ac on Kofa NWR (YPG, 2012b).

Wildfires are expensive to control, detrimental to the natural desert ecosystem, and can destroy equipment and structures. Large, intense wildfires may inhibit the mission of YPG. Wildfire in munitions impact areas cannot be contained by firefighters due to the presence of UXO. YPG may clear vegetation from testing areas and impact zones to minimize the potential for wildfires to start as a result of testing or training activities (YPG, 2012b).

YPG works with the Kofa NWR to coordinate fire monitoring efforts and to interpret vegetation data from burned areas. Wildfire monitoring plots have been established across YPG and on Kofa NWR to monitor the effects of fires on vegetation and to determine the density, frequency, and diversity of vegetation that existed before the burn. The U.S. Forest Service (USFS) incorporates data from YPG to model wildfire potential as part of its LANDFIRE wildfire monitoring and mapping program (YPG, 2012b). These efforts increase the understanding of wildfires and could be used to reduce the potential for fires in the future. The BLM, along with local agencies, serves as the primary responder to wildfire emergencies in the area (YPG, 2012b).

YPG has developed a MOU with USFWS and BLM that establishes guidance for cooperation and collaboration on wildland fire issues on YPG and the surrounding Federal lands (Appendix G). The MOU recognizes a common goal among the signatories to minimize the impacts of wildland fire on the desert landscape and established fire suppression and safety protocols for cooperative efforts to suppress desert wildfires.

3.7.2 Environmental Consequences

The following were evaluated to determine potential impacts to fire management:

- Increased fire ignition potential during construction due to the presence and operation of construction equipment
- Increased fire ignition potential from activities on new increased testing and training areas that involve potential ignition sources
- Increased wildfire spread potential as an indirect result of expansion of exotic vegetation that has a higher fuel load than native Sonoran Desert vegetation

- Increased fire management measures as an indirect result of increased wildfire ignitions

3.7.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to fire management include:

- Negligible (less than significant) – Activities that have barely perceptible impacts on wildfire frequency or intensity
- Minor to Moderate (less than significant) – Activities that would increase the likelihood or potential severity of wildfire ignition
- Minor to Moderate (less than significant) – Activities that would contribute to an increase in the size of wildfires
- Minor to Moderate (less than significant) – Activities that would affect wildfire response capabilities
- Severe (significant) – Actions that are inconsistent with the goals and objectives of YPGR 420-1 and AR 520-90

3.7.2.2 Impacts of the No Action Alternative

Under the No Action Alternative there would be no change from existing conditions with regard to fire management. No new munitions impact areas would be created, no existing munitions impact areas would be expanded, and there would be no increases in testing and training capabilities and no new testing and training areas. The potential for wildfires would remain unchanged. Conditions during years with higher rainfall would typically increase the amount of exotic invasive plant species and native annuals, including woolly plantain, and increase the fuel load in areas where these species grow. The potential for more severe fires would increase under these conditions, but no change in the frequency of wildfire ignitions as a result of activities on YPG would occur.

YPG implements an INRMP (YPG, 2012b) to maintain natural conditions of the installation. Continued implementation of the INRMP includes control and eradication of exotic invasive plant species, which can create very heavy fuel loads if left unchecked. Control of these species reduces the risk of extensive and intense wildfires. In addition, the ITAM program helps maintain natural desert habitats to provide suitable training and operational testing conditions. This program also reduces the potential for extensive and intense wildfires. There would be no impact to fire management under the No Action Alternative.

Climate change is predicted to lead to hotter and drier conditions in the Sonoran Desert, with a shift in the timing of precipitation (Abatzoglou and Kolden, 2011). Under projected conditions, native vegetation would become sparser and fuel loads would be reduced in most years, resulting in a reduced risk of wildfire. However, in years following above normal winter precipitation, exotic invasive annual grasses, such as Mediterranean grass and buffelgrass, and native annuals, such as woolly plantain, would be expected to be more prolific, resulting in a greatly increased fuel load in the following summer and an increased risk of more severe fires (Abatzoglou and Kolden, 2011). Exotic invasive plant management on YPG, as directed in the INRMP, prioritizes detection and eradication of buffelgrass (see Section 3.18) and these efforts would ameliorate future fire risks under the projected climate change.

A new EOC would not be built near LAAF and there would be no benefits to fire management.

3.7.2.3 Impacts of the Proposed Action/Preferred Alternative

The fluctuations in the levels of munitions testing and training over the past decade on YPG provide baseline and maximum levels of munitions use in testing and training. Under the Proposed Action, annual firing of munitions would remain within the upper and lower bounds seen historically, but there would be new or expanded munitions impact areas which would increase the areas where munitions may be fired. Because the number of rounds fired would be within the historical range, no change in the frequency of wildfire ignition from munitions testing and training would be expected compared to the No Action Alternative.

Areas that would be disturbed but not converted to impervious surfaces, such as DZs and UAS launch/recovery areas, bivouacs, and areas where vehicle operation or live-fire testing and training occur, offer the greatest potential for increased wildfire under the Proposed Action. Bivouacs, vehicle operation, and live-fire activities provide ignition sources that can result in wildfire. Operations at TGP's also could contribute to spread of wildfire.

The development of new or expanded munitions impact areas under the Proposed Action would result in greater ability for YPG to minimize fire risk. Where mission requirements allow, testing and training that would create new fire risks would be implemented away from areas with a high fire risk. The development of additional ranges, LTAs, and other facilities under the Proposed Action would enhance this ability and should result in a long-term reduction in wildfire risk on YPG.

Vegetation clearing and other areas where the ground is disturbed provide conditions favorable to establishment of exotic invasive Mediterranean grass, buffelgrass, and Sahara mustard. The role of Mediterranean grass in the spread of wildfire is controversial. Where stands become dense after wet winters, they may provide sufficient fuel to carry fire along what otherwise would be bare ground or desert pavement. Relatively small patches of buffelgrass are established at scattered locations on YPG, including some in very remote areas. Should the population of this species expand, buffelgrass will become YPG's most dangerous vegetation in terms of fuel load to carry wildfire (Merrill, 2012, personal communication). Sahara mustard is widely established on YPG and can develop extensive stands following wet winters. Mature Sahara mustard plants dry, break off at ground level, and blow across the landscape, scattering seeds. These tumbleweed-like plants can accumulate against fences and structures, creating pockets of fuel (Merrill, 2012, personal communication). The role of invasive exotic species on vegetation and potential impacts of these species are further discussed in Section 3.18. Efforts to control the spread of exotic invasive species through continued implementation of the INRMP and the ITAM program reduce the potential for severe wildfire that would cover extensive acreage of the desert.

Because wildfires are suppressed in the Laguna Region, the potential for wildfire escape in the Laguna Region is low. Wildfire suppression would continue in the Laguna Region under the Proposed Action. The areas with the greatest potential for wildfire in the Laguna Region would be vehicle test courses and LTAs, because there would be ignition sources from the activities conducted in these areas. Any fires that start would be suppressed. Any

impacts to activities or safety from wildfire in the Laguna Region as a result of the Proposed Action would be negligible to minor.

The potential for ignition of fires and development of extensive wildfires would be greatest in the Kofa and Cibola Regions, where live fire activities occur. In the Cibola Region, approximately 760 ac of desert scrub vegetation would be cleared for activities associated with UAS launch/recovery areas, TGPs, construction, and utilities installation. An additional approximately 71,050 ac would be converted for use as a dismounted maneuver area or vehicle test course. Approximately 16,310 (16,300 ac under the Preferred Alternative) ac in the Cibola Region would be converted to new or expanded munitions impact areas. In the Kofa Region, approximately 215 ac of vegetation would be cleared for activities associated with UAS launch/recovery areas, construction, and utilities installation. An additional approximately 53,180 ac (51,354 ac under the Preferred Alternative) would be converted for use as LTAs. An additional 26,824 ac in the Kofa Region would be used for new or expanded munitions impact areas under the Preferred Alternative. Live-fire provides potential ignition sources and the potential for ignition is frequently down-range in very remote areas. Even in areas where UXO is not a concern and fire suppression can be implemented, the time required to respond creates the potential for substantial spread of a wildfire prior to the start of control efforts.

Operation of Project K030 in the northern portion of the East Arm would result in increased potential for wildfire ignition in northern Kofa due to operation of vehicles as staff report for and depart from work and from testing activities in an area not currently used for these purposes. Travel would be limited to existing established routes to minimize the potential for vehicle-related ignitions. Any impact on fire management would be minor.

TGPs would be established at 23 locations in the Cibola Region. Individual TGPs would clear up to 2.2 ac for use. During use, these areas would not provide substantial ignition sources because they would be maintained clear of potentially interfering vegetation. Because TGPs are multiple use areas, they are unlikely to be abandoned once established. Continued use of these areas and maintenance to keep these areas suitable to meet multiple testing and training uses would prevent substantial colonization by exotic species and would maintain TGPs in a condition that would not be conducive to wildfire ignition or spread. Should a TGP be abandoned, the area would be susceptible to colonization by exotic invasive plant species, which could contribute to long-term elevated risk of wildfire ignition or spread. Continued implementation of the INRMP and ITAM program would minimize this risk.

Activities at proposed new UAS launch/recovery areas would not be expected to create substantial ignition opportunities. Areas that are cleared or disturbed would be susceptible to colonization by exotic invasive plant species, which could contribute to long-term elevated risk of wildfire ignition or spread and potentially to increased wildfire severity. Continued implementation of the INRMP and ITAM program would minimize this risk.

Activities at proposed new or expanded DZs would not be expected to create substantial ignition opportunities. Areas that are cleared or disturbed would be susceptible to colonization by exotic invasive plant species, which could contribute to long-term elevated risk of wildfire ignition or spread and potentially to increased wildfire severity. Continued implementation of the INRMP and ITAM program would minimize this risk. When DZ testing or training involves munitions, explosives, or combustible materials in proximity to

metal (such as containers or drop platforms) that could spark, a wildfire could be ignited. Many new DZs would be in remote areas and the time required to respond to a fire from a dropped cargo load would result in potential for spread of a wildfire prior to the start of control efforts. YPG will use its GIS model to predict fire risk and to schedule DZ testing and training events that would create new fire risks in areas where the fire risk is not high. The development of new DZs under the Proposed Action would result in greater ability to implement certain activities that involve new fire risks in areas where the fire risk is low, which should result in a long-term reduction in wildfire risk on YPG.

The proposed new or expanded LTAs would not be cleared, but the activities conducted during training and operational testing could provide ignition sources. There would be yearly fluctuations in the frequency, intensity, or duration of training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically. Therefore, no increase in testing and training activities in LTAs that could cause ignition of a wildfire would occur.

Activities that involve the use of pyrotechnics or live fire where the items are delivered distant from the Soldiers could start a fire that could become established before it could be suppressed by onsite personnel. Should this occur, military personnel would evacuate the area and the fire would be reported to Range Control for initiation of appropriate fire suppression efforts.

The ITAM program would restore disturbed areas in testing and training areas where feasible. A program to conduct monitoring and eradication of exotic invasive plants on YPG is in development and, when complete, will be implemented in conjunction with continued implementation of the INRMP.

Expanded and new munitions impact areas could result in a long-term increase in the extent and amount of UXO, which would continue to hamper or prevent efforts to control wildfires in down-range areas. Because the areas proposed for new or expanded munitions impact areas already contain UXO from historical activities, no new areas would become off-limits to firefighting.

A new EOC would be constructed near LAAF, which would be a benefit to fire management and would improve firefighting at LAAF and the surrounding area. This also would be a beneficial impact to fire management on YPG.

Proposed activities L025-a and L025-b would improve vehicle access to the Kofa cantonment area and the Kofa Region, which could reduce response times in the Kofa cantonment and for down-range areas where safety constraints associated with UXO do not preclude control efforts. This would benefit fire management on YPG.

Impacts to fire management and the potential for wildfire to affect the YPG mission would be expected to be minor to moderate with the mitigation measures proposed.

There would be potential for cumulative impacts relative to fuel loading and potential spread of wildfires from increased potential for establishment and growth of exotic invasive plant species in areas disturbed but not converted to impervious surface. There also would be potential for incremental increase in ignition of wildfires from live fire activities resulting from the Proposed Action. No additional projects were identified that would have potential to interact with fire management on YPG to create cumulative impacts.

3.7.2.4 Mitigation

Mitigation measures would reduce the potential for fires and improve fire management. YPG is developing a program to monitor and manage all invasive plants on YPG. YPG would continue to implement ITAM and restore disturbed areas to natural conditions when practicable to prevent the spread of exotic invasive species.

YPG would also continue to coordinate with BLM, USFWS, and the USFS to address fire issues. YPG will share information on burn data and wildfire monitoring with these other organizations to improve fire management in the future.

To the extent allowed within safety constraints associated with UXO, efforts to control and manage wildfires on YPG would be implemented in accordance with the interagency MOU (Appendix G).

YPG would use its predictive model to schedule activities that create new fire risks in areas where the fuel load is not high, to minimize the potential for ignition and spread of wildfire.

YPG would continue cooperative efforts with other agencies in the region to develop and interpret wildfire data.

YPG would implement the following Terms and Conditions from the USFWS BO of September 9, 2014:

- 1a. YPG shall monitor environmental conditions on the Kofa Range, including weather patterns (e.g., temperature, precipitation, humidity) and status of fuels (e.g., distribution and density of annual vegetation or any other vegetation that is capable of carrying fire across the landscape).
- 2a. YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire department with wildland firefighting capabilities. Additionally, YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire station on the KFR to provide rapid response on the Kofa Range in the event of fire. If the fire department and/or fire station are discontinued at any time in the future, YPG shall notify USFWS-Arizona Ecological Services Office (AESO) and Kofa NWR, and this Term and Condition may need to be re-evaluated.
- 2b. Should YPG detect exceptional fuel conditions that are conducive to carrying fire, then YPG shall increase fire readiness by (1) providing additional fire briefings to test officers to stress the importance of initial fire spotting and early notification, and (2) subject to availability of funds, maintaining fire break infrastructure where such infrastructure is compatible with the military mission (as determined by the Senior Commander) and pronghorn conservation (as determined through coordination with Kofa NWR and USFWS-AESO) and is anticipated to reduce the risk of fire spreading to Kofa NWR (as determined by local firefighting agencies).
- 3a. YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to USFWS-AESO and Kofa NWR as soon as possible. The report (can be in the form of an email) will, at a minimum, include the date(s), acreage, and location(s) of the fire(s), as well as the number of

pronghorn in the vicinity of the fire, if known. YPG shall also immediately notify Kofa NWR once aware that a fire has encroached or may encroach onto the refuge.

3.8 Geological Resources

3.8.1 Existing Conditions

YPG is located within the Basin and Range Geologic Province, which is characterized by numerous mountain ranges that rise abruptly from broad, plain-like basins. Altitudes of mountains range from approximately 300 ft to more than 10,000 ft above sea level. Mountain ranges and basins in the Basin and Range Geologic Province of Arizona generally trend north to northeast and range in length from a few miles to more than 60 miles and in width from 1 mile to more than 15 miles. In the Basin and Range Geologic Province of Arizona, intermountain basins typically are through-flowing and this is the condition on YPG. Due to the proximity of the Gila and Colorado Rivers, basin washes on YPG tend to flow through to the rivers (Hendricks, 1985; U.S. Geological Survey [USGS], 2004).

The mountain-basin features of YPG result from block faulting. Exposed mountain rock weathers and is deposited as sediments, forming broad flat valleys and alluvial fans (Hendricks, 1985; USGS, 2004). Typically, sediments in basins of the Basin and Range Geologic Province result from terrestrial weathering, although some sediments in the Lower Colorado River Valley, including the YPG area, may be of marine origin (Hendricks, 1985). In this province, basin sediment depths may extend to 10,000 ft below ground surface (Hendricks, 1985); on YPG the sediment depth in basins is typically much less, but still may extend to more than 1,300 ft below ground surface (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The type of sediment and the rate of weathering of bedrock depend on the composition of the bedrock. Sediments within basins typically contain gravels, sands, silts, clays, marl, gypsum, and salt from combinations of fluvial, lacustrine, colluvial, and alluvial fan deposits (Hendricks, 1985).

The mountain ranges in and around YPG comprise mostly tertiary and quaternary volcanic materials. The mountainous areas cover approximately 25 percent of YPG, with a maximum elevation of 2,822 ft in the Chocolate Mountains (YPG, 2012b). Dome Rock, Middle Mountains, and Castle Dome Mountains are mainly sedimentary limestone from the Paleozoic and Mesozoic eras with some sandstone, siltstone, shale, and conglomerate. The Muggins Mountains are mostly Cambrian metamorphic rocks consisting of schist, granite, and gneiss. These metamorphic rocks also crop out in the Castle Dome, Chocolate, Trigo, and Dome Rock Mountains. Minor amounts of pre-Cambrian and post-Cretaceous granites occur in the Palomas, Dome Rock, Chocolate, and Trigo ranges (YPG, 2012b).

Gold was historically mined from the Kofa, Trigo, Castle Dome, and Muggins Mountains, and also from the stream beds of the Laguna Mountains. Silver deposits, sometimes associated with lead and zinc, were mined from the Muggins and Laguna Mountains. Lead was mined in the Middle Mountains. Iron and copper were mined from the Palomas Mountains. Current mining operations are primarily limited to sources of gravel and sand for construction use. Borrow sites managed by YPG are in designated locations in developed areas, with one site in the northern Cibola Region leased to the U.S. Bureau of Reclamation for supply of fill materials (YPG, 2012b).

The Lost Trigo Fault is 4 miles south of the Cibola Region, Arizona and approximately 31 miles northwest of the Laguna Region cantonment. The Sheep Mountain Fault is southwest of Wellton, Arizona and approximately 35 miles from YPG. The Salton periphery zone, including the Cargo Muchacho fault zone, is 6 miles northwest of the City of Yuma. The Algodones fault zone is in the southwest corner of Arizona. The proximity to seismically active faults in southern California puts the YPG area at risk of earthquakes, although the potential for health hazard and property damage is considered low (YPG, 2012b). The chance of an earthquake with a magnitude greater than 5.0 within 50 years ranges from less than 10 percent to 40 percent across the installation. The greatest potential for earthquakes is in the southwest portion of YPG and the lowest potential for earthquakes is in northern Cibola and eastern Kofa Regions (Parsons, 2011). The peak ground acceleration with a 2 percent chance in 50 years that would be expected from seismic activity ranges from 0.06 to 0.21 g (the acceleration due to gravity), which is considered minimal to moderate (USGS, 2008).

3.8.2 Environmental Consequences

Because there would be no potential for impacts to this resource area, the discussion of impacts is abbreviated and significance criteria and proposed mitigation are not provided.

3.8.2.1 Impacts of the No Action Alternative

There would be no change to existing conditions under the No Action Alternative. As a result, there would be no potential for direct, indirect, or cumulative negative impacts to or from geology.

3.8.2.2 Impacts of the Proposed Action/Preferred Alternative

None of the considered activities would affect the geology of the region. Geologic conditions, including seismicity, are not expected to affect implementation of any considered activity. There would be no potential for direct, indirect, or cumulative negative impacts to or from geology.

3.8.2.3 Mitigation

Because no impacts to geological resources would occur, no mitigation is proposed for this resource area.

3.9 Hazardous Materials/Hazardous Waste

3.9.1 Existing Conditions

3.9.1.1 Background

Hazardous substances are defined as any of the following: any substance designated pursuant to Section 311 (b)(2)(A) of the Clean Water Act (CWA); any element, compound, mixture, solution, or substance designated pursuant to Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); any hazardous waste having the characteristics identified under RCRA; any toxic pollutant listed under the Toxic Substances Control Act (TSCA); any HAP listed under Section 112 of the CAA; or any imminently hazardous chemical substance or mixture on which the USEPA Administrator has taken action pursuant to Subsection 7 of the TSCA. A list of hazardous substances is found in 40 CFR 302.4.

Environmental programs at YPG use management actions to minimize use of hazardous substances and reduce resulting waste streams. Chapter 3 of YPGR 385-1 addresses environmental health risks and applies to all activities on YPG. Strict spill prevention requirements add additional protection for human health and the environment. Industrial processes, routine maintenance activities, testing, and support activities are the primary operations on YPG that use hazardous substances or generate wastes (YPG DPW, 2010b). Lead, in the form of as lead-based paint (LBP), and ACMs also may be present in older structures on the installation. Renovations of residences and other buildings are gradually eliminating these materials from buildings at YPG (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The hazardous materials that are stored on YPG include live high explosives (HEs) and white phosphorus (WP) artillery and mortar ammunition, propellants for such projectiles, various fuels, and projectiles containing DU. Waste products produced by these items are disposed of by various safe methods (Mittlehauser Corporation, 1994).

No hazardous substances or waste are permanently stored, treated, or disposed of at any of the off-post locations used by YPG. Transport of hazardous substances is in accordance with legal requirements. Periodic audits are conducted at YPG facilities where hazardous substances are used and all hazardous substance use is tracked through the Hazardous Material Control Center (HAZMART) using the Hazardous Substances Management System (HSMS). These audits serve as a tracking system for hazardous substance use. In addition to obtaining material usage amounts, storage and containment are investigated. Emphasis is placed on the prevention and control of spills.

As discussed in Section 3.20, groundwater in the vicinity of YPG contains naturally high levels of arsenic.

3.9.1.2 Hazardous Substances Management

YPG stores gasoline, diesel, and chlorine in quantities above reporting limits set by the Arizona Emergency Response Commission (AERC). These substances are reported annually in a Tier II Emergency and Hazardous Chemical Inventory submitted to the AERC and the local Emergency Planning Commission. The Tier II form provides State, tribal, and local offices and the public with specific information on hazardous substances present at YPG. Submission of the Tier II form is required by the Arizona Emergency Planning and Community Right-to-Know Act (EPCRA), which implements Title III of the Federal Superfund Amendments and Reauthorization Act (SARA) of 1986 (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). As an Army testing facility, YPG stores, utilizes, and destroys considerable quantities of propellants, explosives, and pyrotechnics (PEPs). Additionally, small quantities of oil, paint, and acetone are consumed. Industrial radiography for examination of ammunition utilizes photographic chemicals and hydraulic fluids. Historically, YPG operated several solid waste management units (SWMUs) under a RCRA permit issued by the Arizona Department of Health Services in 1980 and subsequently amended as needed, usually every 10 years, with the most recent revision in 2007 (YPG, 2007). In 1996, ADEQ and YPG agreed on a management strategy for SWMUs that involved investigation and cleanup under CERCLA. Additionally, the Army completed a remedial investigation of the installation as part of the DoD Installation Restoration Program (IRP) in 2002. Several removal actions have since been conducted at YPG, as well as interim remedial actions involving soil vapor extraction. Data indicate that other sites on

YPG warrant remedial response and ongoing studies at these sites will be used to determine an appropriate response strategy. Contaminants of concern include petroleum hydrocarbons, VOCs, semi-volatile organic compounds (SVOCs), metals, and PEPs (ADEQ, 2009).

YPG uses a Hazardous Waste Tracking System for all hazardous wastes generated through industrial activities. Hazardous wastes at YPG are managed successfully through the Hazardous Waste Storage Facility (HWSF) located in the YTC area. The HWSF consists of multiple storage pads, Buildings 2668–2677, with each storage pad numbered as a separate building. Hazardous wastes and expired hazardous substances accumulate at this location until disposal. No wastes from outside YPG are accepted at the HWSF and no treatment or permanent disposal of wastes occurs at the HWSF. Hazardous substances are stored according to Army regulations and all applicable Federal, State, and local ordinances and then disposed of properly in appropriate facilities (YPG, 2012b).

3.9.1.3 Installation Restoration Program Areas

There are approximately 1,635 ac, including 32 SWMUs and Areas of Concern, managed under the IRP areas at YPG. New facilities can be constructed within certain IRP sites depending on the level of contamination, clean-up efforts, and land use controls. Approval of new construction within IRP sites must be obtained from the YPG Environmental Division.

Historically, YPG operated several SWMUs under a RCRA permit issued by the Arizona Department of Health Services in 1980 and subsequently amended as needed, usually every 10 years, with the most recent revision in 2007. In 1996, ADEQ and YPG agreed on a management strategy for SWMUs that involved investigation and cleanup under CERCLA. Additionally, the Army completed a remedial investigation of the installation as part of the DoD IRP in 2002. Several removal actions have since been conducted at YPG, as well as interim remedial actions involving soil vapor extraction. Data indicate that other sites on YPG warrant remedial response and ongoing studies at these sites will be used to determine an appropriate response strategy. Contaminants of concern include petroleum hydrocarbons, VOCs, SVOCs, metals, and PEPs (ADEQ, 2009).

There are 32 SWMUs at YPG, primarily in the West Environmental Test Area and the Former Waste Disposal Area. Two of the sites are in the Cibola Range area. Many of these sites are concrete pads, municipal sewage septic tanks, and inactive disposal areas classified as No Further Action Required or are in the process of closure. All proposed projects are reviewed by TPG Environmental Sciences staff for potential impacts prior to implementation (Lewis, 2011, personal communication).

3.9.1.4 Ordnance

Munitions and explosive materials are stored in designated areas. Munitions and explosive storage areas are buffered by EQSD arcs, which provide a safe zone if an unexpected explosion were to occur. There are numerous storage facilities located on the KFR, including a facility for the preparation and modification of all calibers of ammunition, experimental munitions, and small rockets. This facility can store 4.5 tons of explosive items.

Most munitions testing at YPG is conducted at the KFR, which also is used for artillery and mortar testing. GPs at the Kofa Region are both fixed and temporary. The Cibola Region, the

other major range at YPG, primarily supports aircraft armament testing. Tested systems at the Cibola Region include rockets, cannons, and an array of other armaments.

The heavy use of live-fire testing areas for military weapons results in the presence of UXO throughout test areas that must be cleared by Explosive Test Operators. Special techniques are required and regular sweeps of the ranges are conducted. However, substantial quantities of UXO remain on Cibola and Kofa Regions (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

MCOCs may be present throughout YPG in areas where live-fire testing or training occurs and in areas where live munitions are tested for stability and transport. Department of Defense Instruction (DoDI) 4715.14, dated 30 November 2005 was issued to ensure the long-term viability of operational ranges while protecting human health and the environment. YPG was initially tested in 1999 to determine whether MCOCs could migrate off-range at levels that could pose an unacceptable risk to human health or the environment (U.S. Army Center for Health Promotion and Preventative Medicine [USACHPPM]). In 2005, a second range assessment was conducted in response to changes in range use to support the wars in Afghanistan and Iraq, as required by DoDI 4715.14 (USACHPPM, 2007). This study also assessed the potential for pyrotechnics to contribute to MCOCs due to the use of potassium perchlorate in many military pyrotechnics. In 2012, the YOPG ranges were assessed again (EA Engineering, Science, and Technology Inc., 2014). It has been determined that MCOCs are not common in YPG soils (2 percent detection frequency in soil samples) and that there is no evidence to indicate that MCOCs would migrate off of the range complex via runoff and erosion in desert washes (USACHPPM, 1999; USACHPPM, 2007; EA Engineering, Science, and Technology Inc., 2014). Further, leaching to groundwater is not considered a viable pathway for migration due to the extremely low precipitation and the typically great depth to groundwater on YPG. The ranges on YPG are classified as “munitions present, pathways unlikely” and sampling is required every 5 years or more frequently if there are significant changes in range operations, site conditions, or applicable statutes, regulations, or policies that affect range use or the conclusions of the determination (USACHPPM, 1999; USACHPPM, 2007; EA Engineering, Science, and Technology Inc., 2014).

Data collected from the Kofa Region indicate that no degradable explosives remain following firing events. Further, explosives residues were not detected in rodents, insects, vegetation, groundwater, or air from the Kofa Region. Data indicate that the alkaline desert soil may promote degradation of explosives compounds (YPG DPW, 2010b).

YPG is licensed through the NRC to conduct firing involving munitions that contain DU. The NRC-licensed DU impact area is in the northwestern part of the Kofa Region and is regularly monitored to ensure that no adverse environmental impacts occur. After firing, the NRC-licensed DU impact area is searched to recover spent DU rounds (YPG, 2012b). Spent DU rounds are stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army’s Radioactive Waste Authority. The NRC-licensed DU impact area has a DU Catchment Structure designed to capture DU penetrator rods fired in the DU impact area. An evaporative lagoon designed to collect runoff from the DU Catchment Structure is capable of accommodating a 100-year flood event. This lagoon minimizes the potential for transport of DU (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

MCOCs that result from testing include cadmium, mercury, arsenic, barium, chromium, copper, lead, and zinc. Data indicate that none of these metals migrate beyond the munitions impact areas (USACHPPM, 1999; USACHPPM, 2007; EA Engineering, Science, and Technology Inc., 2014). MCOCs may be acutely hazardous in the immediate area of explosive munitions (YPG DPW, 2010b).

Ordnance management is highly controlled. Basic requirements for care of ammunition are defined in Chapter 22 of AMC Regulation (AMC-R) 385-100. Personnel do not handle ammunition unless they are certified under AMC-R 350-4. Ammunition is stored in specially designed magazines. These facilities are located in isolated areas with controlled access.

3.9.1.5 Open Burn/Open Detonation Management Unit

Waste munitions items are treated for hazardous characteristics due to ignitability and/or reactivity by deactivation and subsequent disposal. The open burn/open detonation (OB/OD) treatment process for waste munitions is conducted in accordance with AAC R18-8-264, CFR, Title 50, and the RCRA Part B Permit for YPG. OB/OD is normally the safest method available for the effective destruction, decontamination, and treatment of explosives and explosive wastes for subsequent disposal. These munitions items pose a safety hazard to transport prior to destruction/decontamination.

The OB/OD management unit commonly operates at 100 percent of its daily capacity: 4,000 lb of propellants for open burning and 1,000 lb of explosives or open detonation (RCRA permit attachment). On an annual basis, the OB/OD management unit operates well below its yearly capacity, 191,500 lb of propellants and 36,210 lb of explosives.

The OB/OD site is a satellite accumulation area for waste ash. Waste ash is a by-product of propellant burning, and chemical analysis has detected lead in the waste ash. For this reason, the ash is treated as hazardous waste. Waste ash is accumulated in a sealed and labeled 55-gallon drum, located inside the safety bunker. When full, the drum is transported from the OB/OD site to the HWSF.

The OB/OD facility is completely surrounded by military land used for military activities, and public access is prohibited. No residential communities are located within several miles of the OB/OD facility. Locked gates and warning signs limit site access. Security police patrol the area 24 hours per day.

The Kofa Region OB/OD fenced area measures approximately 7,000 ft by 7,000 ft (approximately 1,125 ac). The OB/OD management unit is a large cleared area consisting of open trenches and two 100-ft x 80-ft open-burn, concrete pads. The open burn areas are lined with high-density polyethylene, with 4-inch refractory ceramic fiber concrete topping coat and three pans on each pad. The pads and pans are used to treat (by burning) excess propellant and ammunition-related materials. Propellant and powder are carefully loaded in burn pans and the material is ignited and left to burn completely. Lead-contaminated ash is collected from the pans and pads for disposal as hazardous waste. The OB/OD facility is operated in accordance with a RCRA Part B Interim Permit authorized by ADEQ. Lined concrete stormwater detention basins about the pads, and secondary containment is provided by reinforced earthen berms. Monitoring wells are located at each site in accordance with the RCRA permit and an Aquifer Protection Permit (YPG, 2008c).

The OB/OD management unit is a satellite accumulation area. No waste explosives (USEPA Hazardous Waste Code D003) are stored at the OB/OD treatment facility. All waste explosives are destroyed by OB/OD treatment. Waste ash (USEPA Hazardous Waste Code D008) is a by-product of burning propellants, and is accumulated in a 55-gallon drum marked with USEPA and U.S. Department of Transportation labels. The ash is temporarily held on the OB/OD treatment facility, inside the safety bunker approximately 3,000 ft from the burn pads and trenches, for later transport to the HWSF.

3.9.1.6 Fuels and Petroleum Products

Fuels at YPG are stored in aboveground storage tanks (ASTs) and underground storage tanks (USTs) for use on the installation. There are 22 ASTs at YPG with a total capacity of 139,298 gallons (Brandon, 2011b, personal communication). These ASTs primarily are used for storage of fuel oil, used oil, aviation fuel, gasoline, or diesel fuel. Many of the ASTs have secondary containment structures to prevent release to the environment in the event of a spill (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). USTs on the installation primarily contain Jet Propellant 8 (JP-8), heating oil, or gasoline. YPG currently maintains 20 active USTs with a total storage capacity of 27,569 gallons for this purpose (Brandon, 2011b, personal communication; Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Under USEPA regulations, facilities with USTs are required to replace them or to install corrosion protection and spill/overflow prevention technology. YPG conducted leak testing of regulated USTs under a POL contract between 1991 and 1995, and is in the process of removing its remaining USTs (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Most POLs, including fuels, are stored either in USTs or ASTs. There are three new fuel facilities with ASTs that are used to store and dispense fuel for government fleet vehicles, including emergency services such as ambulance and fire trucks, and vehicles being tested by Yuma Test Center (YTC), including aviation systems and assets. These three fuel facilities, contractor owned and contractor operated, are located in the Laguna Region at YTC, LAAF, and the Kofa Cantonment (YPG DPW, 2011a). In addition, small amounts of POLs are stored at individual sites and various industrial working locations around the installation for use as necessary in maintenance and repair of vehicles and equipment. In compliance with USEPA regulations, YPG has begun removal of its regulated USTs and all remaining regulated USTs are scheduled for removal and final site characterization. In the meantime, USTs are monitored monthly. Inactive USTs are monitored by vacuum testing and those with good integrity are buried in place (Brandon, 2011b, personal communication).

YPG recycles used oils, which are collected in ASTs and stored in labeled 55-gallon drums. The used oil is picked up by a private contractor for recycling. Control practices such as oil/water separators attached to vehicle wash racks minimize the potential for discharge from normal operations.

The annual volumes of the most often used POLs have not changed substantially in the past 20 years. An exception to this is gasoline. A gasoline station that had three 10,000-gallon tanks was replaced with a station with a two-compartment tank with a 15,000-gallon capacity (Brandon, 2011b, personal communication; Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.9.1.7 Solvents

Solvents are used for parts cleaning during routine maintenance of vehicles and weapons systems. The two most commonly used solvents are Safety-Kleen® solvent and PD680 (Stoddard solvent). Most maintenance activities use Safety-Kleen® solvent, while PD680 is used in aircraft and vehicle maintenance. Safety-Kleen® cold degreasing tanks are located in various buildings on YPG, and degreasing tanks are equipped with a solid stream dispensing nozzle and an interior drain rack. Safety-Kleen® solvent is reclaimed by Safety-Kleen® Corporation on a quarterly basis and pickup manifests are maintained. PD680 is maintained in a cold cleaner immersion tank with an enclosed design in aircraft maintenance areas (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.9.1.8 Pesticides and Herbicides

Pesticide and herbicide use is minimized and chemicals are mixed only in quantities needed for specific application. Annual use of pesticides and herbicides is tracked via the Pest Management Report (Form DD1532). An inventory of chemical pesticides and herbicides is maintained at YPG. Pesticides and herbicides are stored on a concrete spill containment pad within a fenced complex. Information on pesticides and herbicides used on YPG, and a copy of the inventory, are included in the YPG SPCCP and the RCRA Contingency Plan (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Material Safety Data Sheets (MSDSs) for all chemicals used on YPG are available with the chemical inventory. Pesticides and herbicides used on YPG are registered with USEPA, and containers are properly labeled in compliance with the Federal Insecticide, Fungicide, and Rodenticide Act: Part II (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.9.1.9 Asbestos, Lead, and Polychlorinated Biphenyls (PCBs)

YPG has identified buildings on the installation with ACM and has implemented a program of systematic removal from structures as they are renovated or replaced. A site-specific survey for ACM is required prior to initiation of renovation or demolition. Asbestos abatement during construction and renovation is implemented per Asbestos Hazard Emergency Response Act regulations. ACM is managed and disposed of in accordance with the YPG Asbestos Management Plan (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

Lead may occur on YPG either as LBP in older buildings or as a by-product of OB/OD activities. A lead abatement survey was completed for the general housing area and older industrial buildings. An LBP Management Plan was implemented in 1995. The plan is followed before and during renovations of housing and administrative facilities. The management of LBP continues in accordance with Department of Housing and Urban Development guidelines. LBP is disposed of according to RCRA guidelines. Lead ash from OB/OD activities is managed in accordance with RCRA requirements and pollution prevention principles (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

The only known PCBs at YPG were associated with transformer oil. As of April 1997, all transformers known to contain PCBs had been removed and replaced with non-PCB transformers (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). No PCBs are known to remain on the installation.

3.9.1.10 Hazardous Waste Management

U.S. Army regulations specify that management of hazardous wastes must comply with the most stringent Federal, State or local requirements. These regulations not only define hazardous wastes, but, in compliance with Arizona Department of Health Services specifications, also define testing and inspection procedures at the OB/OD facility.

The YPG (HAZMART) tracks all hazardous substance use on-post using the HSMS. Exceptions to the HAZMART tracking are the health clinic, veterinary clinic, and post housing (Jason Associates Corporation, 2008d). The HSMS is an automated chemical tracking system designed to provide “cradle-to-grave” tracking for hazardous substances at the chemical constituent level. The program is designed to centralize the ordering of hazardous substances. The program facility (HAZMART) is the primary collection, storage, distribution, and disposal center for all quantities of hazardous substances at YPG. The functional categories of the HAZMART are control and management, regulated distribution, material reuse and recycling, and reduction of hazardous waste.

Hazardous wastes generated at YPG are managed using the HWSF located in the YTC area. Hazardous wastes and expired hazardous substances accumulate at this location until disposal. No wastes from outside YPG are accepted at the HWSF. No treatment or waste disposal occurs at the HWSF.

YPG maintains a thorough hazardous waste tracking system (HWTS) for all hazardous wastes generated on-post. As wastes are prepared for shipment, the waste generator logs into the HWTS and produces a waste analysis sheet based upon laboratory analysis, generator knowledge, or MSDSs. This analysis is reviewed and approved by the installation environmental coordinator for submittal to the HWSF. The Hazardous Waste Manager generates a DD Form 1348-1A for submittal to the Defense Logistics Agency Disposition Services (formerly Defense Reutilization and Marketing Office) and the waste is again temporarily stored. HAZMART personnel then prepare shipping manifests. Finally, licensed disposal contractors pick up the waste. This system allows detailed tracking of hazardous waste during the entire disposal process (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001; and Jason Associates Corporation, 2008d).

The potential for fuel spills exists in all YPG regions, but the potential is highest in the Laguna Region, where the largest storage tanks are found and where most maintenance operations occur. Tank truck loading and unloading has the potential for large quantity spills. SOPs have been developed to ensure that tank car, tank truck, and vessel loading and unloading procedures meet the requirements and regulations established by the Arizona Department of Transportation and are conducted appropriately to prevent spills. POLs are necessary for maintenance activities and these materials are used in large quantities that fluctuate based on mission requirements.

Routine maintenance and industrial processes are performed in the Cibola Region, and field maintenance of test equipment and weapons occurs in both the Kofa and Cibola Regions. These activities utilize various oils and small quantities of paint, solvents, and lubricants. The Light Armored Vehicle Division at Castle Dome Annex conducts welding, maintenance, and mechanical work that consumes oils, antifreeze, sulfuric acid, paint, and acetylene gas. Conex boxes are used to store in-use hazardous substances (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). There is no long-term storage of hazardous substances

or treatment of hazardous wastes in the Cibola or Kofa Regions, except for munitions bunkers in the Kofa Region. Any wastes generated are taken to the HWSF until disposal offsite. Fuel for vehicles and generators is available from portable fuel tanks and there is potential for spills from refueling activities.

Maintenance of tracked and wheeled vehicles accounts for most of the hazardous substances used and stored in the Laguna Region. Other facilities in the Laguna Region use and store hazardous substances in small quantities.

Chlorine is stored and used in the Laguna Region and the quantities are reported to the EPCRA Reporting Center under Section 313, Title III of SARA and the Pollution Prevention Act of 1990. In years when YPG has no accidental chlorine releases, reporting information is based on storage amounts. YPG works to decrease the use of chlorinated solvents where military specifications provide flexibility. YPG has replaced chlorinated solvents with more environmentally responsible alternatives where mission requirements allow. Safety-Kleen® solvent has replaced PD680 solvent in many applications at YPG. Used Safety-Kleen® solvent is collected and recycled by Safety-Kleen® Corporation outside the installation.

3.9.1.11 Spill Containment

The installation fire department can provide emergency response in the event of a large spill. The RCRA Contingency Plan and the SPCCP provide information on the storage and handling of petroleum-based products, hazardous substances, and appropriate response actions in the event of fire, explosion, or release of hazardous substances and wastes.

3.9.1.12 Disposal

The Universal Waste Rule issued by USEPA (40 CFR 273) is designed to reduce the amount of hazardous waste items in the municipal solid waste stream, encourage recycling and proper disposal of certain common hazardous wastes, and reduce the regulatory burden on businesses that generate these wastes. The rule is intended to promote recycling of batteries, mercury-containing thermometers, and recalled pesticides by relaxing collection, handling, and transportation requirements; and to make it easier to properly treat and recycle these wastes. YPG coordinates with MCAS Yuma and other government agencies to consolidate wastes that are subject to the Universal Waste Rule to increase the cost-effectiveness of recycling and disposal of the waste.

3.9.2 Environmental Consequences

The following were evaluated to identify potential environmental consequences associated with hazardous materials/hazardous waste:

- Increased use of hazardous materials in testing and training activities
- Increased generation of hazardous wastes from operations on YPG
- Increased risk of exposure to hazardous materials or hazardous wastes through testing or training activities
- Use of explosive or incendiary materials in areas where not previously used

Observed impacts of past use and storage of hazardous materials/hazardous waste were used to identify the expected impacts of future use and storage. Potential impacts from hazardous materials/hazardous waste used in testing and training activities were analyzed

in a similar manner. Potential impacts of construction and infrastructure improvement activities were analyzed using the best available information for proposed site-specific actions.

3.9.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to hazardous materials/hazardous waste include:

- Negligible (less than significant) – Activities that result in barely perceptible increases in environmental or human exposure to hazardous materials and hazardous waste and existing management plans and procedures are sufficient to mitigate the risk without establishment of new or additional measures.
- Minor to Moderate (less than significant) – Activities that have potential to increase environmental or human exposure to hazardous materials and hazardous waste through explosion, spill, or other release and existing management plans and procedures are sufficient to mitigate the risk without establishment of new or additional measures.
- Minor to Moderate (less than significant) – Activities that increase the risk for an accidental spill of hazardous or toxic materials in or near a body of water or a desert wash and existing management plans and procedures are sufficient to mitigate the risk without establishment of new or additional measures.
- Minor to Moderate (less than significant) – Activities that have potential to increase the risk of danger to the public or environment during the storage, transport, or use of hazardous materials and existing management plans and procedures are sufficient to mitigate the risk without establishment of new or additional measures.
- Severe (significant) – Activities that have potential to increase environmental or human exposure to hazardous materials and hazardous waste through explosion, spill, or other release such that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.
- Severe (significant) – Activities that have potential to violate one or more applicable regulations.
- Severe (significant) – Activities that have potential to increase the risk for an accidental spill of hazardous or toxic materials in or near a body of water or a desert wash such that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.
- Severe (significant) – Activities that have potential to affect contaminated sites or the progress of remediation activities to a significant degree and require significant regulatory re-negotiation of selected site remedies or result in significant delays to existing remediation plans.
- Severe (significant) – Activities that have potential to increase the generation of hazardous substances to a level that existing management plans and procedures, waste handling contracts, and/or disposition alternatives must be re-evaluated.
- Severe (significant) – Activities that have potential to increase the risk of danger to the public or environment during the storage, transport, or use of hazardous materials such

that existing management plans and procedures are not sufficient to mitigate the risk and additional measures must be established.

- Beneficial – Activities that have potential to reduce the use of hazardous materials, reduce the generation of hazardous wastes, or reduce the potential for exposure to hazardous materials or hazardous wastes.

3.9.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, testing and training would continue to fluctuate between historical high and low levels and no new construction or demolition would occur. No test areas, munitions impact areas, or DZs would be expanded under the No Action Alternative. Under the No Action Alternative, use of hazardous materials would continue at current levels and the amounts of regulated and non-regulated hazardous wastes would be unchanged. Contaminated sites would continue to be managed with existing agreements with USEPA and ADEQ. Localized hazardous waste impacts could result from minor leaks associated with on-road and off-road vehicle use and maintenance, POL spills, and chemical decomposition of military constituents from live-fire activities. Activities would comply with the BMPs identified in the SPCCP and ISCP.

Range assessments to determine the potential for transport of MCOCs off-range will continue to be conducted, as directed by DoDI 4715.14, under the No Action Alternative. Should migration of MCOCs be indicated, YPG would implement appropriate measures to protect human health and the environment.

The program to close or remove all USTs would continue. Implementation and use of the HSMS would minimize the potential for release of hazardous materials. All activities would be conducted in compliance with the YPG SPCCP (Zia Engineering and Environmental Consultants, 2011).

The low annual rainfall, generally level gradient of desert pavement, and high specific gravity of DU limit the transport of DU to washes. Insufficient rainfall also limits the flow in washes, thereby limiting the probability of transporting DU off-post to the Gila or Colorado Rivers (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Additionally, spent DU rounds are collected by Ammunition Recovery personnel and spent DU rounds are stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. YPG has an evaporative lagoon to collect and contain runoff from the DU Catchment Structure that can accommodate a 100-year flood event. This lagoon minimizes the potential that migration would occur from stormwater runoff. Studies have shown (Obregon, 2013c, personal communication) that DU is contained within the DU licensed area and does not migrate. There is no reasonable potential for off-post migration of DU as the NRC-licensed DU impact area is more than 10 miles from the boundary. Climate change is predicted to lead to hotter and drier conditions in the Sonoran Desert, with a shift in the timing of precipitation (Abatzoglou and Kolden, 2011). Under projected future climate conditions, the evaporative lagoon that collects runoff from the DU Catchment Structure would be sufficient to continue to contain runoff from the 100-year design storm.

There would be no beneficial impacts associated with new POL storage areas and reductions in handling and transportation of fuel from installation of hard power under the No Action Alternative.

3.9.2.3 Impacts of the Proposed Action/Preferred Alternative

Testing and training activities included in the No Action Alternative would continue and would be conducted over a wider area under the Proposed Action. Annual levels of testing and training would be expected to fluctuate within historical maximum and minimum levels based on specific needs. The impacts from hazardous materials/hazardous waste that would occur under the No Action Alternative also would occur under the Proposed Action.

None of the activities that would be implemented under the Proposed Action would involve testing or training with DU rounds. As discussed under the No Action Alternative, no off-post impacts from DU would be expected.

All activities that would be implemented under the Proposed Action would be confined within the existing YPG boundaries and there would be no potential for off-post impacts, except as a result of stormwater transport of contaminants (e.g., MCOCs) to washes and downstream receiving waters. Activities that create increased impervious area or clear vegetation could result in increased stormwater runoff. Appropriate construction and post-construction BMPs would be implemented to minimize the potential for increased stormwater runoff during or following land-disturbing activities (see Sections 3.15 and 3.20). Potential impacts would be similar to those of the No Action Alternative. Any impacts would likely be minor.

One proposed construction activity overlaps with an IRP site, and four proposed construction activities are in proximity to IRP sites (Figure 3-3). Proposed activity K023 would construct an electrical power transmission line that would cross an inactive demolition IRP site (YPG-006). If the final design crosses the IRP site, ground disturbance would be limited to placement of support poles, and worker exposure to potential contaminants would not be expected. Proposed activity K031 would construct a new sewage lagoon approximately 75 ft from IRP Site YPG-29, which is an inactive landfill. Hazardous waste disposal did not occur at YPG-29, and no further action is required to remediate this site (Parsons, 2013). Because no additional work is needed to remediate this IRP site, it is very unlikely that construction workers would be exposed to hazardous materials during construction. Proposed activities L001a-b and L015a-b L109 would occur near IRP Site YPG-127, which was historically used as a septic building. Proposed activity L109 would occur near IRP Site YPG-122, which was historically also used as a septic building. The three projects would occur at least 300 ft from either IRP site, and associated ground disturbance during construction would not likely expose construction workers to contaminants. Operation of the proposed facilities would not expose personnel to contaminants, and no impacts from hazardous materials would be expected during operations after construction is complete.

Proposed activity L019 would expand LTAs to include IRP Site YPG-127 (Figure 3-3). Proposed activity L033 would expand the Hill 630 LTA to encompass IRP Sites YPG-002 and YPG-141 (Figure 3-3). There would be no ground disturbance associated with expanding the LTAs and the expanded LTAs would be used for dismounted maneuvers only, with no associated ground disturbance. Therefore, personnel would not likely be exposed to contaminants during operation of the expanded LTAs.

If new facilities would be located in previously contaminated sites, appropriate protective measures would be implemented to safeguard construction workers who may be exposed to

contaminants. In addition, the Army would consult with State and federal agencies. Completing this regulatory consultation would add time and cost to projects planned in such areas.

Construction and facility improvement activities would have little potential for direct impacts from hazardous materials. There could be temporary and minor indirect impacts from building renovations or demolition if the buildings have ACM. This risk would be greatest in the Laguna Region, where most renovation and demolition would occur. Appropriate protective procedures would be implemented when activities could result in exposure of construction workers to ACM. Any impacts would likely be minor. Demolition of existing buildings that may contain hazardous substances such as ACM could create an increase in hazardous waste generation. Any such waste would be managed and disposed of appropriately following established procedures. Any impacts would likely be minor.

Construction areas would have the potential for stormwater runoff to transport minor quantities of hazardous materials from spills into washes and ultimately to downstream receiving waters. Standard construction BMPs (see Sections 3.15 and 3.20 for further discussion of construction stormwater BMPs.) and procedures in the Construction SWPPP, which would be consistent with the Installation SPCCP and the ISCP, would be in place during construction to minimize the potential for accidental release of hazardous materials to impact the environment. Impacts would likely be minor to moderate.

Increased impervious area following construction and paving would have the potential for increased stormwater runoff, which could transport minor quantities of hazardous materials from spills into washes and ultimately to downstream receiving waters. Appropriate post-construction stormwater BMPs (see Sections 3.15 and 3.20 for further discussion of post-construction stormwater BMPs.) would be implemented to minimize the potential for impacts. In addition, activities would comply with the BMPs identified in the SPCCP and ISCP. Impacts would likely be minor.

The proposed increases in testing and training capabilities throughout YPG would have the potential for increased use of hazardous materials and an increase in the need for disposal of hazardous wastes. Expansion of munitions impact areas in the Kofa and Cibola Regions would increase the area into which HE and inert munitions could be fired, which could increase the potential for hazardous wastes from munitions to accumulate in soils. Materials in soil would have the potential to subsequently enter the shallow groundwater table through infiltration. The ITAM program would maintain suitable conditions for training areas and development and implementation of activity-specific SOPs for testing and would minimize the potential for impacts. Testing and training activities in new locations could impact soils and groundwater as a result of contamination from spills of POLs and use of explosives. Activities would comply with the BMPs identified in the SPCCP and ISCP to minimize the potential for contamination.

By dispersing use of munitions over a greater number of sites, the potential for accumulation of MCOCs in soils at any one site would be decreased due to less use per site. Range assessments to determine the potential for migration of MCOCs would continue as described under the No Action Alternative. Periodic studies to determine whether MCOCs have potential to migrate beyond installation boundaries will be conducted and the protocols will be modified to address new and expanded munitions impact areas. See

Sections 3.15 and 3.20 for further discussion of measures to minimize the potential for impacts to soils and water resources. Impacts would likely be minor to moderate.

Operation and maintenance of new facilities and equipment would require some use of hazardous materials and generation of hazardous waste. These materials would continue to be used only in the minimum amount needed. Any increase in use and storage would be minor. Impacts from increased use and storage would be negligible to minor. Disposal of hazardous wastes would follow the established procedures on YPG. Because quantities generated would be small, any impacts would be minor.

Air conditioning systems for buildings that would be constructed could use hazardous materials as a coolant. To comply with 1996 Federal Regulations that require Class I or II refrigerants for new air conditioning equipment, YPG will procure non-ozone depleting chemicals refrigerants for new air conditioning components.

Fluctuations in the demand for live-fire training activities would require periodic increases in the transport of ordnance and hazardous substances. Existing policies and procedures for storage and transport of ordnance and hazardous substances would not need to be modified to address this increased demand. Any impacts would likely be minor to moderate. See Section 3.17 for further discussion.

Installation of hard power and telecommunications lines at training and testing sites would decrease down-range transport of fuel because the number of portable generators in use would be reduced. This would result in less transport of fuel to test locations and less handling of fuel at the test location, which would reduce the potential for spills and reduce the potential for impacts. This would be a minor to moderate benefit.

Through the continued implementation and use of the HSMS, steps would be taken to minimize the potential release of hazardous materials and all activities would be in compliance with the YPG SPCCP (Zia Engineering and Environmental Consultants, 2011).

Testing of wheeled and tracked vehicles and vehicle components would have the potential for contamination from leaks or spills of POL and other vehicle fluids on new test facilities. Activities would comply with the BMPs identified in the SPCCP and ISCP. In addition, development and implementation of activity-specific SOPs for testing would minimize the potential for impacts. Impacts likely would be minor.

The POL storage area and fuel farm planned for the Laguna Region would have the potential for impacts from spills during storage or during transport to these facilities. Secondary containment and implementation procedures outlined in the SPCCP and implementation of the ISCP would minimize the potential for release to the environment. Impacts would be negligible to moderate.

Proper handling, treatment, and disposal of munitions and munitions components at the munitions treatment facility proposed for the Laguna Region would minimize the potential for impacts at this facility. BMPs and procedures outlined in the SPCCP would be followed to further minimize the potential for releases of hazardous materials. Impacts would likely be minor.

New POL storage facilities or improvements to existing POL storage facilities would occur at multiple locations in the Cibola Region. By providing appropriate facilities for storage and containment of POLs, the potential for spills would be reduced and the potential for

release of hazardous materials to the environment would be minimized. This would be a minor to moderate benefit.

Operation of Project K030 would introduce onsite storage of small quantities of POLs in the northern portion of the East Arm. The East Kofa Operations Center (K025a) would provide appropriate facilities for storage and containment of POLs and the potential for spills or for release of hazardous materials to the environment would be minimized. Any impacts would be negligible.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). While minor amounts of hazardous materials would likely be used during construction of such a facility, no cumulative impacts to hazardous materials would be expected from construction. Should a dry-cooled concentrating solar facility be selected as the technology to be implemented, thermal cooling fluid and brine would be by-products of electrical power generation that would require disposal. The heat transfer material for a dry-cooled concentrating solar facility typically would be a Therminol compound. There are 13 Therminol heat transfer fluids marketed in North America, which encompass a range of hazardous waste classifications when disposed of, ranging from not a hazardous waste to may be a hazardous waste, to is a hazardous waste (Solutia Inc., 2012a-n). Depending on the Therminol compound used, there could be a moderate potential for cumulative impacts to hazardous materials from use and disposal of Therminol heat transfer fluids during operation of a dry-cooled concentrating solar facility.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. A variety of chemicals and hazardous substances would be stored and used during construction and operation of the Project. The storage, handling, and use of all chemicals would be conducted in accordance with applicable laws, ordinances, and regulations. Because of the appropriate measures proposed, the Quartzsite Solar Energy Project would not be expected to contribute to hazardous materials cumulative impacts.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to hazardous materials cumulative impacts. At this time, details on hazardous materials in the project areas are unknown and the potential for cumulative impacts cannot be assessed accurately. However, it is expected that BLM will require that these projects implement appropriate use, storage, and disposal measures to minimize the potential for cumulative impacts.

No other future projects with potential hazardous materials impacts are known at this time. The SPCCP and ISCP would be updated as necessary to cover future projects or actions with the potential for spills of regulated materials. Testing and training requirements are expected to continue to evolve over time. This could result in an increase in testing and training activities throughout YPG and would have the potential for cumulative impacts from increased use of hazardous materials, an increase in the need for disposal of hazardous wastes, and the potential for exposure of existing subsurface contamination.

3.9.2.4 Mitigation

Mitigation of the potential impacts from the Proposed Action includes the continued management of hazardous materials using existing environmental programs and guidance to manage the handling and disposal of hazardous materials and waste.

Range assessments would continue to be conducted to determine the potential for migration of MCOCs from ranges. YPG would implement appropriate measures should off-range migration that could affect human health or the environment be indicated.

If new facilities would be sited in previously contaminated sites, appropriate protective measures would be implemented to safeguard construction workers who may be exposed to contaminants. In addition, the Army would consult with State and federal agencies. Completing this regulatory consultation would add time and cost to projects planned in such areas. If contaminated soil is encountered during construction, it would be removed and properly disposed of in accordance with appropriate State and/or Federal regulations.

The YPG SPCCP and ISCP would be updated as necessary and would be implemented to minimize potential for impacts from accidental spills.

YPG will procure non-ozone depleting chemicals refrigerants for new air conditioning components.

Appropriate protective procedures would be implemented when renovation or demolition of existing buildings would result in potential exposure of construction workers to ACM.

In the event that munitions and explosives of concern are discovered in areas of proposed construction, they would not be disturbed until qualified personnel could properly assess and implement appropriate disposition.

3.10 Land Use

3.10.1 Existing Conditions

YPG is primarily used for military testing and evaluation. Land use on YPG is dictated by the Real Property Planning Board, which describes the long-range development of YPG and ensures that YPG meets real property mission requirements, achieves land use compatibility, incorporates holistic and sustainable planning principles, and promotes environmental stewardship. Most land on YPG is reserved for firing ranges, munitions impact areas, mobility test courses, and DZs. These activities typically require large open areas with safety and buffer zones. Test ranges are officially closed to civilian use, except for specifically designated public hunting areas. Seven land use categories are defined for YPG in the FPEIS (Parsons, 2011):

- **Airfield:** designated for flight operations, including runways and taxiways, along with airfield support facilities, including airfield operations, aviation refueling, aviation maintenance, and related test facilities.
- **Range/Open Land:** used for live-fire ranges, non live-fire ranges, and special training areas, including confidence courses, driver training, and land navigation. Land that is undeveloped or unused also is included.

- **Industrial:** includes land designated for production, maintenance, depot and other storage, activities that generate substantial heavy vehicle traffic, loud outdoor equipment operations, and similar activities.
- **Community:** provides facilities, including religious, family support, personnel services, professional services, medical, community, commercial, and recreational activities.
- **Professional and Institutional:** designated land that supports non-tactical organizations, including military schools, headquarters, major commands, and non-industrial research, development, test, and evaluation.
- **Residential:** family housing and senior unaccompanied personnel housing. Family services and other neighborhood services are also included within this category.
- **Troop:** land designated for operational facilities for units. There are no permanent troop areas designated on YPG.

3.10.1.1 Laguna Region

The Laguna Region is used mainly for vehicle and aircraft testing. The Laguna Region includes the MAA, YTC, LAAF, and the CDH. This region also includes the Hot Weather Test Complex, which is a vehicle testing area for hot weather conditions, and a variety of other vehicle testing and training courses. Mobility equipment test facilities within YTC provide courses and obstacles to evaluate vehicle endurance, performance, reliability, and maintainability. The West Environmental Test Area was used exclusively for environmental surveillance testing of nontoxic chemical agents, protection devices, and other military materiel. This area has been closed and is no longer usable under the established land use controls.

EQSD arcs are established for three categories of facilities: Test Facilities, Explosives Storage, and Ordnance Buildings. In the Laguna Region, EQSD arcs are associated with LAAF and also along its eastern edge associated with the Kofa Firing Front (Parsons, 2011).

The MAA is a diverse area that supports community, industrial, residential, and professional land use categories. The MAA contains the main cantonment and provides community support activities, family housing, and unaccompanied personnel housing. Community support at MAA includes facilities such as medical, schools, day care centers, commissary, shoppette, and a chapel (Parsons, 2011).

YTC is classified as industrial and professional and contains the YPG Headquarters and a mix of administrative, vehicle maintenance, and other activities (Parsons, 2011).

LAAF supports airfield and industrial land uses. The LAAF includes facilities and runways to support aviation and airfield operations for the command test mission. Aircraft used here provide aerial spotting of test items and support the Airborne Test Force Branch (Parsons, 2011). Facilities for the MFFS are located in LAAF and MAA.

CDH includes airfield and industrial land use categories. CDH is used for air-ground testing of aircraft armament systems and UAS testing. It includes administrative facilities, aircraft storage and maintenance facilities, a small airfield, and a drone launch site (Parsons, 2011).

3.10.1.2 Cibola Region

The Cibola Region is used for a variety of purposes, including aircraft armament testing, static detonation, conflagration testing, combat skills training, instrument DZs, and extraction zones (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Cibola supports a diverse variety of developmental testing of UAS, aircraft systems, diversified sensor testing including, but not limited to, moored sensor systems, electro-optical, infrared, radar, acoustic, and unattended ground sensors, and wireless communication, air-to-ground, ground-to-ground, and ground-to-air munitions, flares, chaff and other countermeasures, lasers, radars, precision-guided and unguided personnel and cargo parachute systems, direct and indirect fire artillery systems, and combat and automotive systems (Franklin, 2013a, personal communication). Little development occurs within this region and is limited to CDA, multiple airfields supporting UASs and helicopters, GPs, vehicle courses, and JERC sites. JERC sites reconstruct urban-like battle zones similar to conditions encountered in the Middle East. The CDA includes various buildings and test support facilities.

The Cibola Region is dominated by large munitions impact areas and DZs, with Prospect Square being the largest munitions impact area. These areas are undeveloped and open but do contain instrumentation to monitor performance of activities. Range instrumentation may include cameras, radars, and fuse chronographs (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Munitions impact areas may be cleared of vegetation so that fired projectiles can be relocated. Munitions impact areas may contain UXO left over from historical testing of munitions. DZs typically are used to test parachutes and airdrop techniques. Parachute pack maintenance and rigging facilities support the testing of airdrops and other air-to-ground delivery methods (Parsons, 2011). Extraction zones are typically used to test low-altitude parachute extraction systems (Global Security, 2013).

3.10.1.3 Kofa Region

The Kofa Region is used primarily for direct and indirect firing of weapons and munitions, mainly artillery pieces. YPG has over 400 firing positions, most of which are in the Kofa Region with a concentration along the Kofa Firing Front (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The Kofa Region also contains mainly industrial and range land uses, but also includes professional and community uses, most of which are at the western edge along the Kofa Firing Front. The area to the east of the Kofa Firing Front is primarily used as munitions impact areas within the KFR. These munitions impact areas have been designated for a variety of projectiles and mines, including a dedicated NRC-licensed DU impact area. The KFR is outfitted with range instrumentation to monitor performance of weapons and munitions. Supporting facilities include testing and environmental simulation facilities and are typically located along the Kofa Firing Front. The East Environmental Test Area tests materials requiring additional security.

3.10.1.4 Surrounding Land Uses

Land uses adjacent to YPG are primarily undeveloped open space and sparsely populated area where the land ownership includes BLM, USFWS, state and private entities, including agricultural interests. Federally owned land borders YPG on the west, north, and east. Neighboring refuge areas include the Kofa NWR, Cibola NWR, and Imperial NWR. Nearby wilderness areas include the Muggins, New Water, and Trigo Mountains. Refuges along the Colorado River protect wetland and waterfowl habitat and provide recreational areas, such

as the Hidden Shores RV Village (Parsons, 2011). Activities on Kofa NWR and other nearby NWRs and wilderness areas may be impacted by activities on YPG, mainly through noise intrusion and the spread of wildfires. The Arizona Desert Wilderness Act of 1990 (Public Law 101-628) established the wilderness areas and wildlife refuges and also included specific allowances for military activities (see Section 3.11).

Residential, commercial, and recreational development is present near the southwestern part of the installation near Martinez Lake and the City of Yuma. Martinez Lake is the closest community on the southwest side of YPG, while the City of Quartzsite is north of the Cibola Region. The Wellton-Mohawk Irrigation and Drainage District extends along the Gila River between the southern YPG boundary and I-8 and supports crop production (Parsons, 2011; Yuma Area Ag Council, 2011).

Rezoning requests for additional residential development on the south side of YPG are increasing, but zoning for residential development in that area is limited to 1- to 2-ac suburban ranch parcels (Parsons, 2011). Fishing camps between the Colorado River and the western YPG boundary have been converted for use as second homes. Use of these homes is increasing and some are now used as retirement homes and occupied full-time. There are numerous campgrounds, RV parks, resorts, and other lodging facilities along unfenced sections of the YPG boundary. These facilities are commonly used as seasonal residences for individuals who spend the winter in this part of Arizona. People tend to concentrate in these areas during winter months.

3.10.2 Environmental Consequences

The following were evaluated to determine potential impacts to land use:

- Conflict with existing land use on YPG
- Conflict with adjacent, offsite land uses

3.10.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to land use include:

- Minor to Moderate (less than significant) –Activities that would conflict with YPG land use designations but would not have a substantial negative effect on the YPG mission.
- Minor to Moderate (less than significant) – Activities that would conflict with local or regional planning but would not require substantial changes to local or regional development planning efforts.
- Severe (significant) – Activities that would permanently degrade land on YPG so that it could not be used for current or planned use.
- Severe (significant) – Activities that would require substantial changes to local or regional development planning efforts.

3.10.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, testing and training would continue to fluctuate between historical high and low levels and no new construction would occur. At present, there are no conflicts with local or regional planning efforts or with YPG land use designations.

All Noise Zone (NZ) II and III noise contours, as defined in Section 3.11, are within the YPG boundary, with the exception of a small area extending into a portion of the Kofa NWR north of the Kofa Range and an uninhabited area east of the Cibola Range (YPG, 2010a). No development would occur within the NWR, and the extension of the noise contours into this area does not affect land use. The Arizona Desert Wilderness Act of 1990 (Public Law 101-628) established wilderness areas, including Kofa NWR. Provisions within the Act allow continued low-level over flights by military aircraft, the designation of new units of special airspace, and the use or establishment of military training flight routes over the wilderness areas created by the Act. The Act further states that the ability to see or hear non-wilderness activities or uses from within a wilderness does not preclude such activities or uses up to the boundary of the wilderness area. The U.S. Department of the Interior has granted permission to YPG to use 171,000 ac of Kofa NWR as an artillery fire buffer zone (YPG, 2012b). More information on the potential for noise impacts to Kofa NWR is included in Section 3.11. Testing and training activities conducted under the No Action Alternative would not be expected to affect land use on Kofa NWR.

To address potential land use incompatibility issues, the State of Arizona developed the *Arizona Military Regional Compatibility Project Policy Guidebook* (Arizona Department of Commerce, 2006) as a proactive tool to prevent encroachment around military installations. The guidebook offers feasible and sustainable solutions consistent with Arizona compatibility legislation. Due to potential land use issues in the vicinity of military air bases and military air operations, state legislation requires that:

- Areas within high-noise or accident potential zones be addressed in municipal general plans and county comprehensive plans
- Land development within high-noise or accident potential zones be compatible with military airfield operations
- Jurisdictions with property in the vicinity of military airfields consider military operations in their General and Comprehensive Plans (Arizona Revised Statutes Sections 28-8480, 28-8481, and 28-8482)

The Yuma County 2020 Comprehensive Plan (Yuma County, 2013) has designated the lands abutting YPG as either open space or agricultural/rural residential, which will maintain compatibility with the military use on the adjacent YPG lands. Full-time occupied dwellings near the YPG boundary could be incompatible with noise contours and safety requirements of military flight operations. Future development south of Martinez Lake is considered unlikely to affect YPG because of the anticipated low rate of population growth and associated residential development. Additionally, YPG activities are generally compatible with adjacent land uses in this area (Parsons, 2011).

There would be no impact to land use on adjacent lands under the No Action Alternative.

3.10.2.3 Impacts of the Proposed Action/Preferred Alternative

The noise-related impacts that would occur under the No Action Alternative also would occur under the Proposed Action. Off-post zoning and development would be the same as discussed for the No Action Alternative. The slight changes in the noise zones associated with large artillery would not require any changes to the land uses designated in the Yuma

County 2020 Comprehensive Plan. Additional noise-related impacts that would result under the Proposed Action are discussed below.

New construction that would occur under the Proposed Action would be compatible with YPG land use designations and would not conflict with any off-post land uses. No effects to land use would result from new building construction under the Proposed Action.

Testing and training activities included in the No Action Alternative would continue and would be conducted over a wider area under the Proposed Action. Annual levels of testing and training would be expected to fluctuate within historical maximum and minimum levels based on specific needs. The new testing and training areas would be on land designated as Range/Open Land and would not conflict with designated land uses. All activities conducted by YPG would continue within the current boundary and airspace of YPG and would not affect adjacent land uses.

Under the Proposed Action, up to 54,560 ac of land would be converted to munitions impact areas and up to 147,879 ac would be converted to new dismounted maneuver areas. There would be approximately 1,100 ac of land dedicated to air support operations as new or expanded runways and taxiways or as new UAS launch/recovery areas. An additional approximately 1,330 ac of land would be converted to DZs. All of these areas are classified as Range/Open Land, which is compatible with proposed testing and training projects, so there would be no change in land use designation within YPG as a result of these activities, except for the Project K025 (East Kofa Operations Center) and Project K030. The East Kofa Operations Center would convert 10 ac of Range/Open Land to Institutional use and Project K030 would convert 26.1 ac of Range/Open Land to Institutional use. These changes in land use in the eastern and northern portions of the Kofa Region would be a minor impact on land use.

Conversion to munitions impact areas could preclude other future uses unless the areas are appropriately cleared of UXO and other munitions components that create safety hazards.

Land uses and development on adjacent lands would continue to be dictated by municipal and county comprehensive and general plans, the *Arizona Military Regional Compatibility Project Policy Guidebook*, and Arizona legislation. YPG would continue coordination and participation in local plans and development meetings to ensure that encroachment and land use incompatibilities are avoided. No impacts to adjacent land uses would occur as a result of the Proposed Action.

There would be potential for foreseeable future projects to interact with land use on YPG. YPG is considering development of a commercial-scale renewable solar electrical energy generation facility. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Up to several thousand acres of Range/Open Land within YPG would be converted to industrial use and would no longer be available for meeting the military mission. When combined with land use impacts from other projects on YPG, development of a renewable solar facility could result in minor cumulative impacts to land use on YPG.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County

that will be operational in 2015. Approximately 1,675 ac would be converted from open land, which would reduce available rangeland. The Quartzsite Solar Energy Project is not expected to contribute to regional land use cumulative impacts.

Construction, operation, and maintenance of the five additional BLM solar projects would cause land to be converted from open land into solar facilities, which would reduce available rangeland. At this time details on the amounts of land that would be converted and the specific land uses in the project areas are unknown. The potential for these solar projects to contribute to regional land use cumulative impacts cannot be assessed accurately, but there is a reasonable probability that implementation of these projects would contribute to regional land use impacts.

Should solar facilities be developed on BLM land around YPG, glare from such facilities could affect aircraft operations within YPG airspace, which would conflict with current designated use within YPG. No other past, present, or reasonably foreseeable projects would have the potential to interact with land uses on YPG, and YPG actions would not interact with land use outside the installation boundary. No other cumulative impacts are expected.

3.10.2.4 Mitigation

YPG would continue coordination and participation in local plans and development meetings to ensure that encroachment and land use incompatibilities are avoided.

3.11 Noise

3.11.1 Existing Conditions

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although exposure to very high noise levels can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, type of activity during which the noise occurs, and the sensitivity of the individual. The Noise Control Act of 1972, as amended by the Quiet Communities Act (42 U.S.C. 4901 et seq.), provides guidelines and regulations for noise. Chapter 7 of AR 200-1 dictates guidelines and regulations to reduce noise impacts and establishes an Environmental Noise Management Program.

YPG has an Installation Operational Noise Management Plan (IONMP) to guide operations. The IONMP describes the current noise environment and predicts future noise conditions through computer modeling. Installation noise contours from the IONMP are provided in Appendix H. The IONMP provides guidelines to attain land use compatibility between noise generated by military activities on YPG and the surrounding communities (U.S. Army Public Health Command, 2011). An annual evaluation and 5-year updates of the IONMP are recommended by the U.S. Army Public Health Command.

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

- Decibel (dB): A measurement of the sound pressure level.

- **dBA (A-weighted sound pressure level):** Sound pressure level adjusted by an A-weighting filter that places greater emphasis on those frequencies within the sensitive range of the human ear by de-emphasizing the very low and very high frequency components. Typically, human hearing is best approximated by using a dBA scale (USEPA, 1974). For activities on YPG, noise generated by transportation sources (such as vehicles and aircraft) and from continuous sources (such as generators) is assessed using an A-weighted day-night average noise level (ADNL). The yearly day-night average noise level (YDNL) is used for aircraft noise and is calculated over 365 days.
- **dB(C-weighted sound pressure level):** Sound pressure level adjusted by a C-weighting filter, which emphasizes the very low frequency components of sound. For activities on YPG, impulsive noise generated by armor, artillery, and demolition activities is assessed using a C-weighted average day-night noise level (CDNL). The CDNL is calculated over a “training year,” which is typically 250 training days for active military.
- **Peak (PK):** The peak or maximum, single event sound level measurement without weighting. This measurement includes the effects of everything from berms, to weather, to the length of grass on the noise, but is only accurate for a specific moment under the specific conditions at that point in time.
- **PK15 (met):** The peak sound level, using statistical variations caused by weather that is likely to be exceeded only 15 percent of the time. The PK15 (met) accounts for 85 percent of all meteorological conditions including those favorable to sound propagation. PK15 (met) is used for land use planning with small caliber munitions and is used to supplement land use planning for large caliber munitions and other impulsive sounds.

The decibel scale is logarithmic rather than arithmetic. When sound pressure doubles, the sound pressure level, as expressed by dBA increases by 3. Psychologically, most humans do not perceive a doubling of sound until there is an increase of 10 dBA (USEPA, 1974). Sound pressure decreases with distance from the source. Typically, the amount of noise from a continuous source is halved (reduced by 3 dBA) as the distance from the source doubles (USEPA, 1974).

Using the noise measurement scales described above, ICUZs have been established for YPG based on the level of noise exposure in three types of areas, designated as NZs. NZ I has the least noise exposure and NZ III having the greatest (Table 3-10). The intent of ICUZ is to

TABLE 3-10
YPG Installation Compatible Use Zones
Yuma Proving Ground

Noise Zone	Aviation (YDNL)	Impulsive, Large Caliber, Demolitions, etc. (CDNL)	Small Caliber (PK)
Land Use Planning Zone	60-65 dBA	57-62 dBC	N/A
I	Less than 65 dBA	Less than 62 dBC	Less than 87 PK
II	65-75 dBA	62-70 dBC	87-104 PK
III	More than 75 dBA	More than 70 dBC	More than 104 PK

Source: U.S. AR 200-1, Chapter 7 Environmental Noise Management Plan

prevent land use incompatibilities as a result of placing noise-sensitive activities in high-noise exposure areas. Generally, all types of land use are suitable in NZ I. NZ II is typically limited to activities such as manufacturing, warehousing, transportation, and resource protection and is not recommended for noise-sensitive land uses. No noise-sensitive land uses are recommended in NZ III. The Land Use Planning Zone, where noise-sensitive land uses are acceptable, is defined within the upper range of noise levels in NZ I. Noise levels at LAAF do not exceed 65 dB YDNL at current operational levels (U.S. Army Public Health Command, 2011).

Physiological hearing damage to the human ear using the PK threshold occurs at approximately 140 dB, but the threshold for annoyance varies among individuals. PK levels are typically used to determine annoyance levels instead of averages to show with 85 percent certainty how loud a single event at a particular location might get. Table 3-11 shows the risk of complaints generally from small caliber noise events.

TABLE 3-11
Anticipated Risk of Noise Complaints from Predicted Peak Sound Levels
Yuma Proving Ground

Predicted Sound Level PK (dB)	Risk of Noise Complaints
less than 115	Low risk of complaints
115-130	Moderate risk of complaints
more than 130	High risk of complaints

Source: U.S. Army Public Health Command, 2011

Vibrations could become a concern to homeowners due to structural rattling and potential structural damage when the PK from an activity exceeds 120 dB; however, structural damage generally does not occur when the PK is below 150 dB (U.S. Army Public Health Command, 2011). The general public may be annoyed by noise levels from aircraft, with louder aircraft having a greater probability of causing annoyance (Table 3-12).

TABLE 3-12
Percentage of Public Likely to be Highly Annoyed by Aircraft Noise
Yuma Proving Ground

Maximum Level (dBA)	Percentage Highly Annoyed
70	5%
75	13%
80	20%
85	28%
90	35%

Source: U.S. Army Public Health Command, 2011

Ambient noise on YPG includes natural sources, such as wind, and man-made noises, such as aircraft noise, traffic on US 95 and other roads, munitions testing, military vehicle and equipment testing, and military training activities. Aircraft noise includes fixed- and rotary-wing military aircraft from YPG and MCAS Yuma, Arizona Game and Fish Department

(AZGFD) wildlife surveys, and commercial air traffic. The main noise sources on YPG are related to transportation, aviation, and firing activities. The IONMP indicates that all NZ II and NZ III contours are contained within the YPG boundary, except for (Appendix H; YPG-DPW, 2010a):

- Three small areas extending into the southern portion of the Kofa NWR from noise generated in the Kofa Range
- A small area to the east of the Cibola Range around the North UAV Complex and the Tyson DZ, that is more than 2 miles from US 95

YPG personnel use the Kofa and Cibola Regions for testing and training, and portions of these areas not used for testing and training may be used for limited recreational hunting use. Both regions are unpopulated and contain no permanent sensitive receptors.

The only noise-sensitive land uses surrounding YPG are the Martinez Lake area on the Colorado River near the western boundary of the Cibola Range and the Dome Valley agricultural/rural residential area to the south of the Laguna Region. The majority of land within NZs where a risk of complaint exists consists of open space, agricultural, recreational, un-zoned, and BLM land (U.S. Army Public Health Command, 2011).

The Kofa NWR, Trigo Mountain Wilderness Area, Imperial NWR, and the Muggins Mountain Wilderness Area are considered sensitive noise receptor areas around YPG (See Appendix H) due to their proximity to firing ranges and the use of airspace over these areas for military testing and training (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The Arizona Desert Wilderness Act of 1990 (Public Law 101-628), established the Muggins Mountain Wilderness Area, Trigo Mountain Wilderness Area, Kofa Wilderness Area, and Imperial Refuge Wilderness Area, among other Arizona desert wilderness areas. This Act does not preclude or otherwise affect continued low-level over flights by military aircraft over NWR wilderness areas and does not preclude the designation of new units of special airspace, or the use or establishment of military flight training routes over wilderness areas. The Act also states that the ability to see or hear non-wilderness activities or uses from areas within a wilderness does not preclude such activities or uses up to the boundary of the wilderness area. A letter dated December 3, 1958, from the Secretary of the Interior granted permission to YPG to use 171,000 ac of Kofa NWR as an artillery fire buffer zone (YPG, 2012b).

YPG implements a noise complaint management procedure, which provides guidance to those responsible for handling noise complaint issues. The facility point of contact for noise complaints has the following responsibilities:

- Receive noise complaints and complete Noise Complaint Questionnaire while talking to the complainant.
- Investigate complaint-causing activities with personnel involved in activities described in the complaint. Determine if the complaint involved mission-related activities or non-routine tasks, and whether any unusual circumstances existed that may have caused the incident.
- Notify and forward copies of completed Complaint Forms to the YPG Public Affairs Office (PAO) and the YPG Environmental Department within 24 hours of completion, or on the first business day after receiving the complaint.

The YPG PAO has the following responsibilities:

- Review all reported noise complaints.
- Assist units and facility managers in responding to complaints and any required follow-up to resolve public concerns to the maximum extent practicable.
- Maintain a log of all noise complaints for future reference.

The YPG Environmental Department reviews noise complaints and coordinates responses with the YPG PAO.

YPG typically receive less than five complaints per year. YPG receives complaints about airplane over flight noise and from bombing activities at the Barry M. Goldwater Range, which is southeast of Yuma. A majority of aircraft-related noise complaints have been attributable to aircraft operating from MCAS Yuma rather than aircraft from YPG. Persons raising these issues have been informed of the situation and advised to redirect the complaint to appropriate offices at MCAS Yuma or the Barry M. Goldwater Range (Glover, 2011, personal communication; U.S. Army Public Health Command, 2011).

Noise generated by UAS operations was not included in the operational data analyzed to develop the IONMP (U.S. Army Public Health Command, 2011). YPG has received complaints regarding operation of UASs within established YPG airspace, which have been limited to UAS operations based out of CDH. UAS flight paths from CDH have been altered in response to complaints, even though noise from these operations does not exceed the established levels for the designated noise contour (Glover, 2011, personal communication).

To reduce the risk of complaints YPG implements a noise abatement program that is specified in Annex T of the LAAF Standard Operating Procedure, dated November 1, 2010. The noise abatement program identifies the following areas where over flights should be conducted a minimum of 2,000 ft AGL:

- MAA, mainly the housing and school area
- Hidden Shores RV Park
- Martinez Lake area (includes Fisher's Landing Village and the MCAS Yuma Recreation Area)
- Imperial NWR
- Kofa NWR

3.11.2 Environmental Consequences

The following were evaluated to determine potential impacts from new sources of noise:

- Amount of noise from new construction: incremental noise increases would occur from the use of heavy equipment, earthwork, and construction-related truck traffic. Sites with larger construction footprints and sites with intensive earthwork would have greater potential noise impacts.
- Proximity of new construction to sensitive noise receptors: construction sites near sensitive receptors would have greater potential noise impacts.

- Amount of noise from testing and training activities in new areas: incremental noise increases would occur from weapons and munitions testing, military vehicle testing, training exercises that use live or dummy munitions or involve vehicle/equipment operation, and operation of aircraft and UASs. The scale of specific testing or training activities would influence their potential for generating noise impacts.
- Proximity of new testing and training activities to sensitive noise receptors: actions near sensitive receptors would have a greater potential for noise impacts.

3.11.2.1 Significance Criteria

Noise impacts would be considered significant if any of the following criteria are met:

- Minor to Moderate (less than significant) – Activities that would generate noise above current levels detectable to residents and users of YPG and the surrounding areas.
- Minor to Moderate (less than significant) – Activities that would generate noise that results in temporary changes in wildlife behavior.
- Minor to Moderate (less than significant) – Activities that would generate noise of 115–130 PK15 (met) beyond the installation boundary.
- Severe (significant) – Activities that would exceed 65 ADNL beyond the installation boundary and affect sensitive receptors on and off of YPG.
- Severe (significant) – Activities that would exceed 62 CDNL beyond the installation boundary and affect sensitive receptors on and off of YPG.
- Severe (significant) – Activities that would exceed 130 PK15 (met) beyond the installation boundary and affect sensitive receptors on and off of YPG.
- Severe (significant) – Activities that would generate noise that results in property damage or adverse health effects to humans.
- Severe (significant) – Activities that would generate noise that causes long-term changes in animal behavior, results in disruption of animal reproductive cycles, or causes a reduction in survivability.

Public Law 101-628, the enabling legislation for designated wilderness areas in Arizona contains provisions authorizing military over flights over wilderness areas adjacent to military installations and also authorizing non-wilderness activities, including generation of noise, up to the boundaries of wilderness areas. Because the noise from military operations at YPG are allowed under Public Law 101-628, no significance criteria for noise related to the adjacent wilderness area were established.

3.11.2.2 Impacts of the No Action Alternative

Potential sensitive receptors would include on-post personnel and families, nearby civilians and travelers not associated with YPG, recreational hunters, and wildlife that could perceive noise caused by activities on YPG. Each of these receptors is discussed below.

YPG personnel are at risk of exposure to elevated noise during testing and training activities. Soldiers could be exposed to elevated noise from weapons and combat vehicles during training and operational testing, live-fire exercises, powered aircraft operation, and ground vehicle operation. Testers could be subject to similar exposures during performance

and reliability testing of vehicles, weapons, munitions, and equipment. On-post personnel are protected from high noise levels through safety training, use of appropriate hearing protection, and compliance with SOPs developed for specific testing and training activities. YPG has an industrial hygienist and trained safety professionals on staff to ensure that proper procedures are designed and implemented for unusual military activities and for standard industrial activities, including construction (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

The slight changes in the noise zones associated with large artillery would not affect use of nearby lands outside the installation boundary. The sparsely populated and undeveloped land surrounding YPG typically lacks potential sensitive human receptors. NZ II and NZ III noise contours are within the YPG boundary except for two locations. NZ II and NZ III extend for short distances into the Kofa NWR at three points to the north of the Kofa Range (Appendix H). These areas within Kofa NWR are uninhabited desert and mountainous areas. There are no sensitive human receptors in these areas. NZ II extends just outside the installation boundary to the east of Cibola Range in the area of Tyson DZ and the North UAV Complex. This uninhabited area is designated as open space and is more than 2 miles from US 95 (U.S. Army Public Health Command, 2011). Civilians and travelers not associated with YPG could be exposed to nuisance noise levels when travelling on US 95 or when using camping facilities/areas in the vicinity of YPG, but these noises would be intermittent and of short duration. Typically, noise from military operations along US 95 would be minimal and likely unnoticed by vehicle occupants talking or listening to radio. Most recreational camping facilities/areas are across mountains from areas where testing and training occurs. The intervening mountains act to reduce the noise from military activities and the exposure would be to nuisance noise levels.

Noise generated in the Kofa and Cibola Regions from munitions testing and live-fire or operational testing typically is contained by the surrounding mountains and does not reach potential human receptors. Any such noise extending beyond the YPG boundary would not exceed noise levels allowed in wilderness areas and would be unlikely to negatively affect wildlife (Glover, 2011, personal communication; Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

Noise from testing and training activities near the boundary of Kofa NWR and noise from aircraft over flights that use airspace over Kofa NWR are audible on the refuge, with noise levels from munitions testing typically between 57 and 62 dBA where noise enters the refuge. Natural attenuation of noise over distance results in this noise being audible for several miles within the refuge, which typically lacks other sources of noise. This noise level is comparable to the 60 dBA of a normal conversation or the inside of an office (Vanderheiden, 2004) and is not normally a noise level that would disturb receptors. Wilderness area users frequently seek solitude in wilderness areas and the frequent noticeable noise from explosions, while not loud, could disrupt the solitude experience. However, because of the location of the wilderness area in the Kofa NWR adjacent to an active military test range and because of the designation of much of that wilderness area as a buffer for military artillery testing, users of the wilderness area on Kofa NWR would not have an expectation of quiet. The noise from artillery testing would be no more than a minor impact to the recreation experience.

Military over flights of Kofa NWR occur daily within Airspaces R-2307, R-2308A, R-2308b, and R-2308C. Most military aircraft over flights of Kofa NWR are conducted between 5,000 and 32,000 ft AGL. The IONMP identifies Kofa NWR as an area where pilots should remain at least 2,000 ft AGL, and this noise recommendation is recognized in the LAAF Operations Manual. At these altitudes, the impacts of military over flights on recreational users and wildlife, including protected species, would be minor.

Should flights from MCAS Yuma or the Yuma Airport increase in the future, there would be potential for cumulative impacts to noise. Aircraft operations on YPG could incrementally add to the noise from MCAS Yuma and the airport. Because most aircraft operated on YPG are rotary wing aircraft or UAS, the incremental contribution to the noise environment would be less than that from commercial jet aircraft operating from the airport or military jet aircraft operating from MCAS Yuma. Any incremental contribution from aircraft noise from YPG operations would be expected to be minor.

Noise from testing and training activities can cause wildlife in the immediate area to relocate or alter behavior. Noise generated by ongoing testing and training activities would continue to cause temporary, but recurring, impacts to wildlife. The effects of noise on wildlife are further discussed in Section 3.21, and the effects of noise on protected species are presented in Section 3.18.

3.11.2.3 Impacts of the Proposed Action/Preferred Alternative

The impacts of noise from the Proposed Action would be similar to the impacts described in the previous section for the No Action Alternative. No expansion of the YPG boundary would occur but an increase areas used in testing and training would occur. The area encompassed by noise contours for large caliber sources outside installation boundaries would increase slightly (Appendix H).

YPG operational data from 2010 were doubled to conduct a conservative analysis of potential future noise levels. The expected increase in noise levels from implementation of the Proposed Action would be substantially less than double existing noise levels because activities would occur over more of YPG and noise sources would be less concentrated in the areas now used.

Based on computer modeling of future conditions that would exceed the expected noise levels on YPG under the Preferred Alternative, noise from large caliber munitions based on CDNL would increase outside the YPG boundary along the northern boundary of Kofa Range. Most of the increased noise would emanate from Bravo, Delta, and Echo impact areas and increased noise levels could extend approximately 2.5 miles into the Kofa NWR (Appendix H). Noise from Delta and Bravo would reach the mountains in the southwestern portion of Kofa NWR. Noise from Echo would reach King Valley. The analysis of the potential impacts of this noise on wildlife is provided in Section 3.21, and the analysis for protected species is provided in Section 3.18.

Noise levels in open space/recreational resource areas east of the Cibola Range at the North UAV Complex and the Tyson and La Posa/Robby DZs would increase when fluctuations in demand result in periods of greater levels of testing and training activities. Increased noise would extend less than 1 mile to the east of the YPG boundary in this area (U.S. Army Public Health Command, 2011; Appendix H). Two small areas would extend outside the YPG boundary south of the Laguna Region in the Muggins Mountains area, but noise levels

would be within the LUPZ (57-62 CDNL; Appendix H). Because the number of testing and training activities would be within historical levels, there would be no change in the noise environment outside installation boundaries as a result of the Proposed Action.

Should flights from MCAS Yuma or the Yuma Airport increase in the future, there would be potential for cumulative impacts to noise. Aircraft operations on YPG could incrementally add to the noise from MCAS Yuma and the airport. Because most aircraft operated on YPG are rotary wing aircraft or UAS, the incremental contribution to the noise environment would be less than that from commercial jet aircraft operating from the airport or military jet aircraft operating from MCAS Yuma. Any incremental contribution from aircraft noise from increased YPG operations under the Proposed Action would be expected to be minor.

There would be construction-related noise that would not occur under the No Action Alternative. Construction-related noise would be spread over several years as a series of separate construction projects are implemented. Construction activities also would be spread spatially across YPG rather than concentrated in a single area. Construction-related noise would not be expected to extend to off-post sensitive receptors. Construction workers would be required to wear appropriate hearing protection, and YPG employees would be instructed on proper safety procedures in and around construction sites.

Operation of Project K030 would result in a noise source in the northern portion of Kofa where there are no permanent man-made noise sources at present. The only potentially sensitive receptors to this noise, which would be typical of cantonment areas on the installation, would be the personnel working there. No impacts associated with noise would be expected from operation of Project K030.

A large portion of proposed construction would occur in previously developed areas, which does not offer the preferred habitat of most species occurring on YPG. Wildlife would be temporarily disturbed by construction noise and would likely relocate to similar habitat nearby until construction is complete. Construction noise related to the Proposed Action would be spread out in time and space and would have a temporary, but recurrent, negative minor effect on wildlife.

Expanded munitions impact areas at Echo and SWTR would be 1 kilometer (approximately 0.62 mile) from the Kofa NWR boundary in the King Valley area and 500 m (approximately 0.31 mile) from the Kofa NWR to the west of King Valley. The noise analysis assumed that these impact areas would extend up to the boundary of the refuge, and that the distance from the refuge would reduce noise levels from activities in these impact areas. Because there would be no increase in the number of HE rounds fired compared to historical levels, there would be no change in the noise environment on Kofa NWR as a result of using the proposed new munitions impact areas.

YPG has begun investigating the possibility of developing a solar renewable energy resource on the installation through an EUL with a private company to increase YPG's energy security and meet federal mandates and legislative requirements to increase production and consumption of renewable energy resources. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Potential noise impacts would be limited to the construction phase of the solar facility, as operational noise would be

minimal. Because no long-term noise source would be created and because there would be no permanent receptors in the vicinity of construction, no cumulative impacts to noise would be expected from development and operation of a solar facility on YPG.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. There could be short-term noise impacts during construction, but the Project would not contribute to cumulative noise impacts because operational noise would be minimal.

Construction of the five additional BLM solar projects could cause short-term noise impacts. Operation and maintenance of the five additional BLM solar projects would likely not contribute to cumulative noise impacts, as any noise impacts would likely be limited to the duration of construction. Operational noise from solar systems typically would not be substantial.

No cumulative noise impacts would be expected from development and operation of a commercial-scale renewable solar electrical energy generation facility on YPG. No substantial long-term noise would result from operation of the system.

3.11.2.4 Mitigation

Measures to prevent land use incompatibilities with adjacent lands, including impacts from noise, would include active participation and coordination in local and regional planning, as discussed in Section 3.10. To reduce the potential for noise impacts, YPG would implement physical and procedural mitigation objectives to the extent practicable. Physical mitigation includes placing barriers between the source and receiver or orienting the source in a position so that noise is directed away from the receiver. Physical mitigation measures include the following:

- Locating/relocating ranges relative to natural impediments such as in valleys or behind large mountain ranges.
- Constructing artificial berms or enclosing a small caliber range within walls and baffles.
- Orienting noise sources toward the interior of the installation and position activities that generate noise in remote locations away from sensitive receptors.

Certain weather conditions affect impulsive noise propagation (Table 3-13). Favorable conditions occur when noise does not propagate as far as when compared to nonfavorable conditions. Testing and range management would conduct potential noise generating tests under favorable conditions to the extent practicable.

TABLE 3-13
Firing Conditions Related to Noise Propagation
Yuma Proving Ground

Favorable Conditions for Conducting Tests	Nonfavorable Conditions for Conducting Tests
Clear skies with billowy cloud formations, especially during warm weather.	Days of steady winds 5-10 miles per hour (mph) with gusts of greater velocities (above 20 mph) in direction of nearby residences.
A rising barometer immediately following a storm.	Clear days, when layering of smoke or fog is observed. Days following large temperature differences (about

TABLE 3-13
Firing Conditions Related to Noise Propagation
Yuma Proving Ground

Favorable Conditions for Conducting Tests	Nonfavorable Conditions for Conducting Tests
	20°C) between day and night.
	Generally high barometer readings with low temperatures.

Source: Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001

Procedural noise mitigation includes the following:

- Implementing fly-neighborly programs that adjust aircraft training times and routes to lower the impact on the community to the greatest extent possible given mission requirements.
- Adjusting the timing, when feasible, of particularly disruptive activities to avoid conflicts with local events such as church services or holidays. Keeping the community informed, when practicable, making public any unusual increases in the intensity of training or if training is to be resumed after a period of inactivity.
- Reviewing Environmental Assessments (EAs) and EISs to ensure that the noise impacts of the Proposed Action are addressed and are consistent with the IONMP.
- Monitoring the noise environment (as opposed to computer modeling) when the noise environment is controversial, when a NZ III exists in a noise-sensitive area, or when a noise is unique and cannot be modeled.
- Incorporating noise contours as a layer in the GIS so that the contours may be combined with other layers (such as land use) and referenced when siting new facilities.
- Continuing implementation of the noise complaint management procedure described in Section 3.11.1.
- Maintaining aircraft operations in compliance with established ICUZ.

YPG personnel and construction workers would wear proper hearing protection and receive appropriate training as required by specific testing, training, or construction activities. To minimize human exposure safety zones and hazardous noise areas would be established as needed and would include the use of noise level meters and warning signs (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.12 Recreation

3.12.1 Existing Conditions

Much of the Cibola Region is within designated Game Management Unit (GMU) 43B and a portion also is within the southern portion of GMU 43A (AZGFD, 2010a and AZGFD, 2012) and much of the Kofa Region is within GMU 41 (AZGFD, 2010b).

GMU 41 has established hunting seasons for mule deer (*Odocoileus hemionus*) (November through January), desert bighorn sheep (*Ovis canadensis*) in December, Gambel's quail (*Callipepla gambelii*) from October through January, and mourning dove (*Zenaidura macroura*) in

September. GMU 43A has established hunting seasons for mule deer (November and January), desert bighorn sheep in December, quail from October through February, mourning dove in September and again from November through January, and Canada geese from October through January. GMU 43B has seasons for desert bighorn sheep in December, mule deer rifle season in November and archery season from December through January, mountain lion (*Puma concolor*) from August through May, Gambel's quail from October through February, mourning dove in September and again from mid-November through early January, and waterfowl from October through February.

YPG is closed to the public and outdoor recreational opportunities are limited. Hunting is the primary recreational activity on YPG. In coordination with AZGFD, five recreational hunting areas have been established in portions of YPG where safety constraints were not an issue and where hunting would not interfere with the military mission of the installation:

- Cibola Hunting Area
- Highway 95 Hunting Area
- Arrasta Hunting Area
- Martinez Hunting Area
- East Arm Hunting Area

In-season hunting for mule deer, desert bighorn sheep, Gambel's quail, mourning dove, white-winged dove (*Zenaida asiatica*), Eurasian dove (*Streptopelia decaocto*), and African collared dove (*Streptopelia rosogrisea*) is permitted in all five designated areas. No areas suitable for waterfowl hunting occur within YPG boundaries, and mountain lion hunting has not been conducted on YPG. Hunters are required to obtain an annual YPG hunting license in addition to required state and federal licenses, permits, and tags.

Overnight camping in conjunction with hunting is permitted, but hunters are required to obtain proper advance authorization. Hunters who camp may use only downed wood for campfires and must properly dispose of their trash (Yuma Proving Ground Hunting Program [YPG HP], 2011). Since 1979, YPG has gradually increased the number of public hunting days and the available hunting acreage. While the potential for hunting on YPG is limited due to mission constraints and security concerns, YPG typically allows up to the maximum number of hunting days in accordance with state law in the designated areas (YPG, 2012b).

There is no recreational fishing on YPG. Natural waters on YPG are ephemeral and do not sustain recreational fisheries. Man-made and natural storage ponds are not feasible for recreational fishing due to constraints associated with the military mission.

An area in the southern portion of the Laguna Region is authorized for use by the BSA and D.A.R.E. During hunting season, YPG permits BSA scouting trips to designated hunting areas (YPG HP, 2011). In 2009, YPG approved an All-Terrain Vehicle Recreational Use Area adjacent to the MAA (YPG DPW, 2009). Horseback riding by YPG staff and their families is allowed on-post, and a stable within the YTC area is available for boarding privately owned horses. Horse owners are responsible for maintenance and upkeep of their animals. MCAS Yuma operates a recreational facility at Martinez Lake adjacent to the Colorado River that is open to local military personnel and their families (YPG, 2012b). The MAA has a bowling alley, fitness center, and other Morale, Welfare, and Recreation facilities that serve the YPG community (AECOM et al., 2011).

Three USFWS NWRs are located in the vicinity of YPG. As discussed in Section 2.1.1, the land between the arms of the YPG “U” is the Kofa NWR, which was established in 1939. The Kofa NWR encompasses approximately 665,400 ac of desert habitat. Kofa NWR offers a variety of recreational activities, including hiking, camping, sightseeing, photography, and nature observation. Regulated hunting for quail, desert bighorn sheep, deer, desert cottontail (*Sylvilagus auduboni*), coyote (*Canis latrans*), and gray fox (*Urocyon cinereoargenteus*) is permitted (USFWS, 2008).

The Cibola NWR, established in 1964, is located in the Lower Colorado River floodplain. The Cibola NWR encompasses both the historic Colorado River channel and the channelized portion constructed in the late 1960s. The refuge includes a nature trail and several wildlife viewing areas. Hunting is permitted in specific areas for Canada goose (*Branta canadensis*), snow goose (*Chen caerulescens*), various duck species (family Anatidae), American coot (*Fulica americana*), gallinules (family Rallidae), Gambel’s quail, mourning and white-winged doves, mule deer, and desert cottontail. The refuge also offers recreational fishing opportunities (USFWS, 2011a).

The Imperial NWR is directly south of the Cibola NWR and also within the Lower Colorado River floodplain. The Imperial NWR encompasses approximately 25,768 ac and was established in 1941 as a refuge and breeding area for migratory birds and other wildlife. Similar to the other NWRs in the area, the Imperial NWR offers hiking, birding, wildlife viewing, hunting, and fishing opportunities (USFWS, 2010).

The Imperial Sand Dunes, managed by the BLM, are located in southern California approximately 15 miles west of Yuma. The dunes were formed by windblown sands from ancient Lake Cahuilla and extend for more than 40 miles. The Imperial Sand Dunes offer scenic views and opportunities for off-highway vehicle driving with appropriate permit(s) (Bureau of Land Management California, 2011). The Picacho State Recreational Area is part of the California State Park System and provides fishing, hiking, wildlife viewing, swimming, and camping opportunities (YPG, 2012b).

3.12.2 Environmental Consequences

The following were evaluated to determine potential impacts to recreation:

- Temporary impact to public access through temporary closure of areas or access roads within YPG that are used by the public.
- Permanent loss of existing recreational opportunities due to new construction or use of new areas for testing or training activities.
- Reduced recreational use due to occasional closure of an existing area used for recreation due to activities in new or expanded testing and training areas.

3.12.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to recreation include:

- Minor to Moderate (less than significant) – Activities that would affect the regional availability of recreational opportunities, access to public lands, or on-post recreational opportunities.

- Severe (significant) – Activities that would eliminate the regional availability of a particular recreational opportunity or that result in long-term closure of an important public access point.

3.12.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, recreational activities and opportunities on or near YPG would not change. Testing and training activities conducted on YPG would continue to fluctuate between historical high and low levels and areas designated for recreation and hunting would not be affected. All of Cox Field would remain in irrigated grass and would be available for passive recreation. There would be no significant impacts to recreation under the No Action Alternative.

Under the No Action Alternative, the following proposed activities that would benefit recreation would not be implemented:

- Construct addition to youth services center (L012-c).
- Construct an outdoor park (L106) at YTC.
- Convert Street D into pedestrian walkway.

3.12.2.3 Impacts of the Proposed Action/Preferred Alternative

There would be no effects to off-post recreational opportunities as a result of the Proposed Action. All impacts of the Proposed Action on recreation would be limited to within the boundaries of YPG.

Seven proposed activities could conflict with recreational hunting on YPG:

- Project C047-r (Ehrenberg TGP) would result in potential impacts with hunting in a small portion of the Cibola Hunting Area. Should testing or training events requiring use of this TGP be scheduled during hunting season, public hunting would be suspended for the duration of the testing and training activities. Any impacts on public hunting would be expected to be minor.
- Project K001 (1,640-ft radius DZ for personnel and cargo drops in southern portion of East Arm) would result in potential conflicts with recreational hunting in portions of the East Arm Hunting Area. Should testing or training events requiring use of this DZ be scheduled during hunting season, public hunting would be suspended for the duration of the testing and training activities. Any impacts on public hunting would be expected to be minor.
- Project K021 (Create an LTA in the East Arm) would result in potential conflicts with recreational hunting in portions of the East Arm Hunting Area. Should training events be scheduled in this LTA during hunting season, public hunting would be suspended for the duration of the training activities. Any impacts on public hunting would be expected to be minor.
- Project K030 (Construct runway, taxiway, aircraft shelter, command and control room, simulator training room, classroom, maintenance area, POL storage area, graded area for parking, and concrete or asphalt pad, clear area for GCSs, and clear area for UAS launch/recovery) would result in conflicts with recreational hunting in a small portion of the East Arm Hunting Area. Implementation of this activity would result in conversion of 26.1 ac of land currently available for hunting to institutional use where

hunting could not occur. In addition, there would likely be restrictions on hunting in proximity to this area to prevent risk to personnel and equipment from public hunting activities. Any impacts on public hunting would be expected to be minor.

- Project L016-a (Construct building, concrete or asphalt pad, shade structure, and install solar lights at Site 2) would result in potential hunting conflicts in the Martinez Hunting Area. If construction of this activity were to occur during hunting season, public hunting would be suspended until the construction was complete in the area of the construction activity. Some land available for hunting would be converted to buildings and pads, but the amount of converted land would be minor. Should training events be scheduled in this LTA during hunting season, public hunting would be suspended for the duration of the training activities. Any impacts on public hunting would be expected to be minor.
- Project L016-b (Install hard power, fiber, and communication service at Site 2) would result in potential hunting conflicts in the Martinez Hunting Area. If construction of this activity were to occur during hunting season, public hunting would be suspended until the construction was complete in the area. Any impacts on public hunting would be expected to be minor.
- Project L019 (Expand and combine West LA LTA, K-9 Village LTA, Site 2 LTA, and Site 4 LTA) would result in potential hunting conflicts in the Martinez Hunting Area. Should training events be scheduled in the portion of this LTA that overlaps the Martinez Hunting Area during hunting season, public hunting would be suspended for the duration of the training activities. Any impacts on public hunting would be expected to be minor.

The construction of the ISR/EO ground truth sites across Cibola and Kofa, including some areas where public hunting is allowed, would not be expected to affect public hunting due to the small size and passive nature of the ISR/EO sites.

No proposed activities would be conducted within the Arrasta and Highway 95 Hunting Areas and there would be no changes to public hunting in these areas.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012).

Development of a commercial-scale renewable solar electrical energy generation facility could affect recreational hunting on YPG, depending on the location selected. Development of the facility would result in conversion of up to approximately 8,900 ac of desert habitat, which would reduce recreational hunting opportunities if the site is within a designated hunting area.

The following proposed activities would have the potential to affect other on-post recreational activities:

- Construct addition to youth services center (L012-c).
- Construct an outdoor park at YTC (L106).
- Construct Cox Field improvements (L107).
- Convert Street D into pedestrian walkway (L107).

The current youth services center is not configured correctly for multiple purpose uses and lacks a high ceiling for sports such as basketball or volleyball. These activities are conducted outdoors and can be unsafe in extreme temperatures. The proposed addition to the youth services center would create additional recreational opportunities for the youth on YPG and meet the minimal requirements of a Community and Family Support Center. The addition to the youth services center would be a benefit to on-post recreation for children. Minor temporary disruptions of services at the center could occur during construction, but any impacts would be minor.

The construction of an outdoor park at YTC would create new opportunities for passive recreation in this area. There is no outdoor open space for YPG employees in the YTC cantonment. The construction of the outdoor park would add to the quality of life of employees in this area and would create additional recreational opportunities. This would be a benefit to on-post recreation in the YTC area.

Improvements at Cox Field would result in the removal of a portion of the grass turf that is used by YPG residents for passive recreation, such as picnics and casual play with children. The xeriscaped area that would replace the turf would offer different passive recreational opportunities, primarily nature observation, that would likely be less used by residents than the turf field. There would be a net minor negative impact to recreation on YPG due to reduced area available for this use.

The conversion of D Street to a pedestrian walkway would provide opportunities for increased walking within the MAA. Creating an area where regular walking could occur would be a minor benefit to passive recreational opportunities in the MAA.

There would be no impacts to off-post recreational opportunities and minor to moderate impacts to public hunting on YPG. Impacts of the Proposed Action would include beneficial improvements to recreational activities and opportunities on YPG and would have minor negative impacts to some recreational activities. Minor temporary disruption of some recreational activities could result from construction activities at facilities where recreation occurs. There would be a minor loss of green space used for casual play and picnics in the MAA. No other impacts to recreation would occur.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. Approximately 1,675 ac would be converted from open land, which could cause indirect impacts to nearby recreational uses through alteration of the visual landscape. The Quartzsite Solar Energy Project could contribute to cumulative impacts to regional recreation.

Construction, operation, and maintenance of the five additional BLM solar projects would likely result in incremental loss of recreational opportunities on BLM lands as projects are implemented. In addition, the appearance of the solar facilities could be a negative experience for recreational users in the area. The combination of loss of usable land and degradation of the recreational experience through altered visual character could contribute to cumulative impacts to regional recreation.

No other cumulative impacts to recreation would be expected beyond the minor incremental benefits to recreation from the Proposed Action.

3.12.2.4 Mitigation

No mitigation is proposed for recreation, as no significant impact to recreational opportunities would occur.

3.13 Safety

3.13.1 Existing Conditions

The main safety concerns on YPG are related to contamination, UXO, fires, and traffic and safety, which are present both in military and non-military activities. Safety also is the basis for establishment of AT/FP setbacks and use of controlled access points on the installation. The YPG safety program educates and protects people from injury and exposure to conditions that could lead to injury. The safety program applies to all persons on YPG, including military, civilian, dependent, and contractor personnel.

Safety for military personnel and contractors involved with mission-related activities is a priority and personnel are trained individually for the various testing and training activities through specific programs. AR 385-1 (*Safety and Occupational Health Program*) and YPGR 385-1 (*Yuma Proving Ground Safety and Occupational Health Program*) define the safety program on YPG. Contractor personnel are required to comply with the Occupational Safety and Health Act in addition to all YPG safety requirements. Range safety during testing and training events is governed by YPG SOP YP-MTRO-P-1000 (*Airspace and Range Operations*). Each individual operation or test is required to have a specific SOP, which must meet the requirements of SOP YP-MTRO-P-1000 at a minimum and may include greater safety controls. Medical evacuation pads for helicopter access are located throughout much of YPG. The very remote areas of YPG, such as north Cibola Region or East Arm, lack medical evacuation pads.

Range Control oversees all activities conducted on the Cibola and Kofa Regions. Military or contractor personnel must receive clearance from Range Control prior to entering these areas. Range Control tracks all activities in down-range areas, including all testing or training using live fire or explosives. In addition to obtaining clearance prior to entry into the Cibola or Kofa Regions, persons also must check in with Range Control when changing positions on the range or upon leaving these areas.

Contamination on YPG primarily occurs as a result of industrial processes, routine maintenance activities, testing, and support activities and could affect personnel if an exposure pathway exists. The environmental programs on YPG minimize the use of hazardous substances and the resulting waste streams. Spill prevention measures are implemented to further protect personnel and the environment (YPG DPW, 2010b). Chapter 3 of YPGR 385-1 addresses environmental health risks and applies to all activities on YPG. Areas where contamination could occur are restricted and non-military persons are not at risk of exposure.

Contamination from PEPs and MCOCs is present in designated munitions impact areas, and munitions containing DU have been used in the NRC-licensed DU impact area in the Kofa Region. Contamination of munitions impact areas and other contaminants on YPG, including safety measures, are discussed in Section 3.9. There is no evidence that contamination from PEPs and MCOCs have migrated from designated munitions impact areas (USACHPPM, 1999; USACHPPM, 2007; EA Engineering, Science, and Technology

Inc., 2014; YPG DPW, 2010b). Because these areas are restricted, non-military personnel are not at risk of exposure.

UXO from testing and training activities on YPG poses a safety concern for YPG personnel and fire-fighters. UXO is present in designated munitions impact areas (see Section 3.9). Safety procedures for explosives and usage of the Cibola and Kofa Regions are specified in YPG Regulation 385-1. Areas used to store explosives are buffered by EQSD arcs, which provide a safe zone if an explosion were to occur. Because the munitions impact areas are restricted, non-military persons are not at risk of exposure.

Civilians are not permitted on YPG, except as military contractors, dependents, and hunters. Appropriate speed limits and traffic controls are placed throughout the installation and provide for traffic safety for all persons on YPG. Hunters are allowed in designated areas during official hunting seasons. An annual YPG range safety briefing is required before anyone can obtain a hunting permit.

Trespassers could enter restricted areas on YPG and be at risk from UXO. In the past, campers have been found on YPG who indicated that they were unaware they were trespassing. Warning signs are posted along the boundary and roads through YPG to deter trespass.

Because non-lightning ignited wildfires occur on munitions impact areas that are in restricted and remote areas of the Cibola and Kofa Regions, fires on YPG typically do not affect the public. Fires in areas contaminated with UXO frequently cannot be fought or contained and must be allowed to burn out due to the risk to firefighting personnel (see Section 3.7).

US 95 and County Highway S24/Imperial Dam Road cross portions of YPG. Both are two-lane paved roads with typical rural road speed limits. US 95 and County Highway S24 experience the heaviest traffic volume from 5:00 to 7:00 am and from 3:30 to 5:30 pm and YPG-associated traffic is the primary component of the heavy traffic (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). AR 385-55, Prevention of Motor Vehicle Accidents, provides guidance to drivers, which includes off-duty safety, training, and other vehicle safety guidance. YPG enforces speed limits and advocates YPG personnel to obey traffic laws. YPG implements DoD requirements that vehicle operators not use cellular phones while driving. Most materials are delivered to YPG via US 95. The transportation of explosives and other hazardous substances is discussed in Section 3.17.1.5. Guidance for the proper transportation of hazardous material is provided in AR 385-55, which addresses training, storage instructions, inspections, and planned routes.

Valley fever (*Coccidioidomycosis*) has been identified as a health issue in Arizona. This disease results from a fungal infection after susceptible persons inhale airborne dust from desert soils that contain fungal spores of the genus *Coccidioides* (Centers for Disease Control and Prevention [CDC], 2013). In Arizona, most cases occur in the Phoenix and Tucson areas, and the YPG area (Yuma and La Paz Counties) has had relatively few cases (Table 3-14; Arizona Department of Health Services, 2012; Arizona Department of Health Services, 2013). Yuma and La Paz Counties have each averaged between 0.1 percent and 0.3 percent of total reported cases for Arizona for the period 2007–2012. While the disease can strike anyone, it is much more prevalent among older persons (60 years of age and older) and those with suppressed or compromised immune systems (CDC, 2013).

TABLE 3-14
Reported Cases of Valley Fever in Arizona and in Yuma and La Paz Counties, 2007—2012
Yuma Proving Ground

Year	Reported Cases in Arizona ^a	Reported Cases in Yuma County ^a	Percentage of Cases in Yuma County	Reported Cases in La Paz County ^a	Percentage of Cases in La Paz County
2007	4815	13	0.3 %	15	0.3 %
2008	4768	7	0.1 %	7	0.1 %
2009	10,233	12	0.1 %	21	0.2 %
2010	11,884	21	0.2 %	26	0.2 %
2011	16,473	30	0.2 %	45	0.3 %
2012	12,920	33	0.3 %	25	0.2 %

^a Data from Arizona Department of Health Services, 2012 and Arizona Department of Health Services, 2013

The YPG safety program educates and protects people from injury and exposure to injurious effects. The safety program applies to all persons on YPG, including military, civilian, dependent, and contractor personnel.

3.13.2 Environmental Consequences

The following were evaluated to determine potential impacts to safety:

- Potential construction-related safety risks to workers
- Potential for safety risks from activities in new or expanded testing and training areas
- Potential for traffic-related safety risks from increased military traffic on US 95, Imperial Dam Road, or Martinez Lake Road as a result of activities in new or expanded testing and training areas

3.13.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to safety include:

- Minor to Moderate (less than significant) – Activities that would affect, or have potential to affect, the health and safety of persons on- and off-post.
- Severe (significant) – Activities that would violate established Federal, State, and local health and safety laws and regulations or create new safety hazards off-post.
- Beneficial – Activities that would reduce potential safety risks.

3.13.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, there would be no new construction and testing and training would continue to fluctuate between historical high and low levels. YPG personnel would continue to comply with the YPG Safety Program, including developing test-specific SOPs and coordinating activities through Range Control. No impact on safety would be expected.

The YPG Safety Office will develop an information flier on valley fever. The Safety Office also will make a safety announcement about the availability of this flier to YPG personnel and dependents.

There is potential for recreational users in the southern portion of Kofa NWR that is within YPG Airspace R-2307 to be within temporary safety fans established for firing activities on

YPG. Any recreational users in this area would be at risk during the associated YPG operations. Prior to conducting operations with a safety fan that extends into the Kofa NWR, YPG will verify there are no people in the portion of an SDZ extending into the Kofa NWR, primarily by visual or electronic means. Helicopters will be used to locate people only where large portions of an SDZ overlap Kofa NWR, primarily in R-2307.

Beneficial impacts to safety associated with construction of MEDEVAC pads, safe haven relocation, hard power, and road improvements would not occur under the No Action Alternative.

3.13.2.3 Impacts of the Proposed Action/Preferred Alternative

The Proposed Action includes creation of new testing and training capabilities and new construction. Measures that would be implemented under the No Action Alternative would be implemented under the Proposed Action. The following sections discuss the potential for safety impacts from construction activities and from YPG operations.

Construction. Construction activities would create short-term increased safety risks to workers. During construction, workers would have the potential for accidents as a result of routine job exposure to heavy equipment and construction debris. Construction workers also would be exposed to elevated noise levels from heavy equipment and construction activities. Potential safety issues related to construction noise are further discussed in Section 3.11. Workers would use appropriate protection and comply with appropriate safety standards. Any potential safety impacts from construction would be minor.

Construction-related traffic could result in a minor increase in traffic-safety risk. Construction-related traffic and appropriate mitigation measures to minimize safety risk are further discussed in Section 3.17. Any impacts would be minor.

Construction of proposed activity L002 would require that construction workers access LAAF and work in the clear zones of LAAF. Work would be coordinated with Flight Operations to minimize safety risks associated with work on and adjacent to an active airfield.

Construction of TGP and down-range infrastructure projects in the Cibola Region would require that construction workers access restricted portions of the Cibola Region and construction of down-range infrastructure Projects K001, K025-b, K030 in the Kofa Region would require that construction workers access restricted portions of KFR. All movement to and from these sites would be coordinated through Range Control to avoid conflicts with munitions testing. Helicopters would be used to evacuate injured workers should immediate care be required. Because of the coordination with Range Control and the availability of helicopter evacuation, no adverse safety impacts would be expected from construction activities in these remote restricted areas in the Cibola and Kofa Regions.

Activity C026-d would result in minor safety benefits by relocating aboveground wires to underground conduit.

Operations. Implementation of the Proposed Action would be expected to result in net minor to moderate benefits to safety on YPG. Certain proposed activities are specifically intended to benefit safety, while many others would provide indirect safety benefits. No activities are proposed that would directly increase safety risks on YPG.

AT/FP improvements would be constructed at multiple locations in the Laguna Region. These activities would reduce the risk of external threats to security and safety on YPG. Helicopter landing pads for MEDEVAC would be constructed in the northern Cibola Region, which would result in more prompt response and treatment should serious injury or illness occur at a JERC site. Flood upgrades on Aberdeen Road at Castle Dome Wash would improve safety conditions for persons traveling between US 95 and the Kofa cantonment. In the MAA, D Street would be converted to a walkway, which would enhance pedestrian safety. Shade would be installed at multiple locations (K-9 Village, Site 2, CM 4, Lightweight Shock Facility, and Stinger Pole target) to reduce exposure to the sun and associated heat stress for persons working in these areas.

Installation of hard power and telecommunication service at multiple locations on the Cibola and Kofa Regions would reduce the use of portable generators, which would provide indirect benefits to safety. Transportation of generators and fuel to remote areas on the Cibola and Kofa Regions would be reduced, which could benefit transportation safety on range roads in these areas. Less fuel would be managed at test sites, reducing the potential for fuel-related accidents at down-range locations.

Personnel manning the East Kofa Operations Center would have to cross KFR to reach the site. All movement to and from the East Kofa Operations Center would be coordinated through Range Control to avoid conflicts with munitions testing. Because of the coordination with Range Control, no adverse safety impacts would be expected from staff travelling to the East Kofa Operations Center.

The LTAs proposed by activities C060, C064, and K026 would be in areas where UXO may be present. Dismounted maneuvers in these LTAs would be restricted to established trails and roads unless UXO clearance was completed in advance of the maneuvers. With maneuvers restricted to existing roads and trails, no safety impacts from the potential presence of UXO would result.

Personnel training in the proposed dismounted maneuver areas at SCAM Flats, Tower 71, East Arm, and SWTR would have to cross KFR to reach the site. In addition, use of SWTR would be coordinated among the following uses: personnel training at dismounted maneuver area, UAS launch/recovery, and use of SWTR as an impact area. All movement to and from the proposed dismounted maneuver areas and proposed UAS launch/recovery sites would be coordinated through Range Control to avoid conflicts with munitions testing. Because of the coordination with Range Control, no adverse safety impacts would be expected from operations.

Testing at the DZ that would be created by Project K001, operation of the testing/training complex in the northern portion of the East Arm (K030), and training activities at the East Arm LTA (K021) would result in personnel operating in very remote areas. Personnel working at these sites would coordinate with Range Control for access and any serious injuries would require use of helicopters for evacuation. Because of the coordination with Range Control and the availability of helicopter evacuation, no adverse safety impacts would be expected from operational activities in these remote areas in the Kofa Region.

The relocation of Safe Haven would reduce the risk that an overnight accident at a truck awaiting cargo delivery to YPG would affect persons in the Kofa cantonment.

Use of new or expanded testing and training areas, including increased vehicle use to access these new areas, would not be expected to change the rate of safety-related incidents on

YPG. There could be an increase in the number of safety-related incidents during a specific period because more activities could be scheduled simultaneously. However, because the YPG Safety Program would be implemented, safety issues from incidents related to increased activity would be expected to be minor.

New and expanded testing and training areas could increase the risk of wildfire on YPG through exposure of new areas to potential ignition sources. Vegetation clearing and land disturbance associated with construction, creation, and use of UAS launch/recovery areas, DZs, and TGP's may create conditions favorable to establishment of exotic invasive vegetation, which would create increased fuel loads and increase the risk of severe wildfire. TGP's would serve a variety of testing and training uses and would not likely be areas where exotic invasive species would establish unless the TGP's were abandoned. See Sections 3.7 and 3.18 for further discussion of fuel loads and wildfire. Wildfire would continue to be suppressed in the Laguna Region and any impacts to safety from increased risk of wildfire or severe wildfire would be expected to be minor.

There would be potential for foreseeable future projects to interact with safety on YPG. Should a solar-powered electrical generation facility be constructed in the Cibola Region, glare from such a facility could affect aircraft operations within YPG airspace, which could increase safety risks.

The incidence of valley fever in the YPG area is low. The proposed activities would not be expected to increase the incidence of the disease. Testing activities would not expose personnel to risk of the disease, as testers would not be exposed to dust-generating activities. Dismounted maneuver training places Soldiers at risk due to moving and bivouacking in the desert, but the disease does not typically affect young, physically fit persons with strong immune systems (CDC, 2013). YPG implements dust suppression in populated areas, which minimizes the potential for spread of dust-borne fungal spores. The YPG Safety Office will develop an information flier on valley fever. The Safety Office also will make a safety announcement about the availability of this flier to YPG personnel and dependents.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. There would be minimal health and safety risks during construction and operations of the project, and they would not contribute to regional safety cumulative impacts.

Construction, operation, and maintenance of the five additional BLM solar projects would be unlikely to contribute to cumulative impacts to regional safety. It is anticipated there would be minimal health and safety risks during construction and operations of the projects.

Proposed Arizona Department of Transportation (ADOT) improvements to US 95 would increase safety along this road for public travel and for YPG-related travel. This would be a cumulative benefit to safety in the region and also would occur under the No Action Alternative. No other past, present, or reasonably foreseeable projects would have the potential to interact with safety on YPG. No other cumulative impacts are expected.

3.13.2.4 Mitigation

YPG would implement mitigation to minimize the potential adverse impacts to safety from construction and active munitions areas. During construction, workers would follow

appropriate OSHA standards to prevent injury. On-post personnel would comply with the YPG safety program and coordinate with Range Control.

Prior to conducting operations with a safety fan that extends into the Kofa NWR, YPG will verify there are no people in the portion of an SDZ extending into the Kofa NWR, primarily by visual or electronic means. Helicopters will be used to locate people only where large portions of an SDZ overlap Kofa NWR, primarily in R-2307.

3.14 Socioeconomics

3.14.1 Existing Conditions

This section describes the socioeconomic environment in the vicinity of YPG, which includes the impact of YPG on the regional economy. YPG is relatively isolated within a large county containing few large urban areas. The potential for socioeconomic impacts would be confined primarily to YPG and the nearby urban area (the City of Yuma).

The City of Yuma is the largest population center in the region and the population has been increasing. The Yuma metropolitan area was the third fastest growing metropolitan area in the country between 1990 and 2000 (Yuma County Chamber of Commerce, 2011). Almost all YPG civilian personnel reside in Yuma or the surrounding area and only 450 people live on YPG (YPG, 2011a). From 1990 to 2010, the population of the City of Yuma grew by approximately 69 percent and the population of Yuma County grew by approximately 83 percent (Table 3-15). The climate is attractive to temporary winter residents and the winter

TABLE 3-15

Population Data for Local Cities and Counties, the State of Arizona, and the United States
Yuma Proving Ground

	1990 Census ^a	2000 Census ^b (% change from 1990)	2010 Census Estimates ^c (% change from 2000)	2020 Projections ^d (% change from 2010)
Yuma City, Arizona	54,923	77,515 (41%)	93,064 (20%)	119,464 (28%)
Ehrenberg, Arizona	1,226	1,357 (11%)	1,470 (8%)	1,486 (1%)
Quartzsite, Arizona	1,876	3,354 (79%)	3,677 (10%)	4,317 (17%)
La Paz County, Arizona	13,844	19,715 (42%)	20,489 (4%)	25,487 (24%)
Yuma County, Arizona	106,895	160,026 (50%)	195,751 (22%)	271,361 (39%)
Arizona	3,665,228	5,130,632 (40%)	6,392,017 (25%)	8,779,567 (37%)
United States	248,709,873	281,421,906 (13%)	308,745,538 (10%)	324,927,000 ^e (5%)

Sources: ^a USCB, 2011c; ^b USCB, 2011d; ^c USCB, 2011a, ^d Arizona Department of Economic Security, 2006, ^e USCB, 2000

population of Yuma County typically increases by 80,000 to 100,000 each year (Yuma County, 2011). Yuma County population projections for 2020 indicate an approximately 39 percent increase from 2010 levels, with the City of Yuma growing by approximately 28 percent in that same timeframe. YPG also extends northward into La Paz County, but

there are no large metropolitan centers abutting YPG in this county. The cities of Quartzsite and Ehrenberg are located north of the installation in La Paz County. La Paz County grew by 48 percent from 1990 to 2010, but growth slowed greatly after 2000, with only a 4 percent increase from 2000 to 2010. Growth is projected to increase again in La Paz County, with an increase of 24 percent over the 2010 population expected by 2020 (Table 3-15).

YPG and MCAS Yuma, along with farming, cattle ranching, and tourism, are the main employers in Yuma County. Agriculture, tourism, and the military account for \$900 million, \$450 million, and \$300 million, respectively, of the local economy (Yuma County Chamber of Commerce, 2011). The military in Arizona, indirectly and directly, accounts for \$9.1 billion in economic output and 96,328 jobs (The Maguire Company, 2008).

YPG contributes over \$425 million a year to the Arizona economy, most of which stays within Yuma County. YPG is the largest employer in Yuma County, with more than 3,000 military and civilian employees and also is the county's largest civilian employer. Approximately 23,000 visitors per year come to YPG and more than 100 military units, which include up to 10,000 Soldiers, Marines, and other military personnel who come to YPG each year to train under realistic hot desert conditions (YPG, 2011a). These visitors contribute to the revenue of airlines, local hotels, restaurants, and other area businesses. Among government organizations, YPG is one of Yuma County's main consumers of local goods and services. Federal impact funds are provided as payment to the local school districts to defray the cost of accommodating military children in the public school system (YPG, 2011a).

YPG implements a variety of assistance and outreach programs for personnel and families. For example, the federally funded Women, Infants, and Children Program assists participants in maintaining a nutritionally balanced diet. The Financial Readiness Program offers financial assistance and assists in resolving problems with local businesses. YPG also operates a volunteer program for activities in the local community (YPG, 2011b).

3.14.2 Environmental Consequences

The following were evaluated to determine potential impacts to socioeconomic resources:

- Wages from employment associated with new construction projects
- Spending to acquire construction materials from local or regional merchants
- Secondary spending by construction workers among local or regional merchants
- Secondary spending by non-assigned personnel and supported components who temporarily visit YPG for testing or training activities
- Reduced spending for fuel for operation of portable generators and for delivery of portable generators, fuel for portable generators, and potable water.

3.14.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to socioeconomic resources include:

- Negligible (less than significant) – Activities that would result in barely perceptible changes in income, jobs, and population levels.
- Minor to Moderate (less than significant) – Activities that would affect, or have potential to affect, short-term income, jobs, and population levels.

- Severe (significant) – Activities that would affect, or have potential to affect, long-term or permanent income, jobs, and population levels.
- Severe (significant) – Activities that would result in changes in population levels (particularly declines) that appreciably exceed typical historical fluctuations and could burden community services.
- Beneficial – Activities that would contribute to the local and regional economy.

3.14.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, there would be no change in existing conditions, including the number of staff at the YPG. The existing YPG complex would continue to operate. YPG would remain the largest employer in Yuma County and would continue to contribute over \$425 million a year to the AZ economy. No impacts to socioeconomics would be anticipated.

Short-term beneficial impacts to the local economy as a result of increased spending due to purchase of building materials and construction jobs would not occur under the No Action Alternative.

3.14.2.3 Impacts of the Proposed Action/Preferred Alternative

Direct Impacts. There would be short-term minor benefits to the local economy from the purchase of building materials and construction jobs as a result of the various construction projects. Construction workers would come from the general Yuma area and no new permanent jobs would be created. No new long-term jobs are anticipated at YPG as a result of new construction activities or from increased testing and training activities. These impacts are considered minor. Because there would be no permanent change in workforce and no long-term construction would occur, no cumulative impacts to socioeconomic resources would be expected.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). There could be minor cumulative beneficial impacts to socioeconomics from development and operation of a commercial-scale renewable solar electrical energy generation facility. There would be long-term creation of a few jobs, which would have a negligible beneficial impact on regional employment. Operation of this facility would reduce the demand for electricity from the grid for YPG, which could contribute to reduced rates paid for electricity and provide incremental benefits to the regional economy.

There could be minor cumulative beneficial impacts to regional socioeconomics from development and operation of the Quartzsite Solar Energy Project, approximately 10 miles north of Quartzsite, Arizona in La Paz County. There would be short-term creation of 280 jobs and long-term creation of 47 jobs, which would incrementally benefit regional employment. Operation of the facility would provide an additional source of electrical power, which could contribute to reduced rates paid for electricity and provide incremental benefits to the regional economy.

There could be minor cumulative beneficial impacts to regional socioeconomics from development and operation of the five additional BLM solar projects. There would likely be short-term and long-term job creation, which would incrementally benefit regional employment. Operation of the facilities would provide additional sources of electrical power, which could contribute to reduced rates paid for electricity and provide incremental benefits to the regional economy.

Indirect Impacts. No new employees are anticipated to relocate to the area as a result of the Proposed Action. There would not be an increased demand for housing, education, or other public services. The workers who would be employed on the construction project may have increased income, and would continue to spend money in Yuma, which is a minor indirect beneficial impact.

There could be an indirect minor negative impact on local fuel and water retailers. If hard power is installed to many test locations, fuel would no longer be required for portable generators at those locations. The effect on the local economy due to the reduction of purchased fuel or potable water would be less than significant.

3.14.2.4 Mitigation

Mitigation is not required for socioeconomic impacts because direct and indirect impacts are minor and temporary or beneficial.

3.15 Soils

3.15.1 Existing Conditions

The soils on YPG are of the aridisol and entisol soil orders. Aridisols generally are older and more developed soils and are characterized by light-colored surface layers with low amounts of organic matter and at least one diagnostic sub-horizon (Hendricks, 1985). As the aridisols soils age under arid conditions, cemented layers of salts and carbonate, commonly referred to as caliches and hardpans, may form (YPG, 2012b). Entisols typically are younger than aridisols and occur in areas subject to wind erosion or scour by surface water runoff. Entisols have little or no horizon development, but may have a thin surface layer with accumulated organic matter (Hendricks, 1985).

Nine soil complexes occur on YPG. Most soil complexes on YPG are not susceptible to water or wind erosion. Some soils become more susceptible to erosion following disturbance or under certain landscape position/slope conditions (Table 3-16).

Aridisols at YPG include the Cristobal, Chuckwalla, and Gunsight soil types. Cristobal and Chuckwalla are the soils in areas with desert hardpan or desert pavement. Gunsight soils occur on adjacent side slopes. Entisols at YPG include the Carrizo, Lithic Torriorthents, Typic Torriorthents, Rositas, Carsitas, Antho, Gilman, and Glenbar soil types. Carrizo soils are located in the dried riverbeds. Lithic and Typic Torriorthents are young shallow deposits on mountainsides. Rositas and Carsitas consist of active shifting sands. Antho, Gilman, and Glenbar soils occur in the broad valley floodplains along washes (YPG, 2012b).

Desert pavement, which consists of a surface covering of closely packed fragments of pebbles, gravel, cobble, or debris weathered from bedrock, is common in bajadas (level plains between washes) throughout much of YPG (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). A silt- and clay-rich soil horizon, designated as the Av

horizon due to its position in vesicles among the rocks, underlies the armored, tightly packed desert pavement surface layer. The Av horizon ranges from 0.01 to 3.94 inches thick and forms through an accretionary process by trapping atmospheric dusts. The eolian dusts are a combination of clay, silt, calcium carbonate, and soluble salts. The accumulation

TABLE 3-16
Soil Complexes on YPG
Yuma Proving Ground

Soil Complex Name	Landscape Position	Percent Slope	Areas of YPG	Hazard of Water Erosion	Hazard of Wind Erosion
Carsitas family- Chuckawalla family Complex	Dissected relic beach terraces; fan terraces	4-30%; 1-7%	Laguna Region; Southern boundary of Kofa Region	Slight	None
Chuckawalla family- Gunsight family Complex	Fan Terraces; summit/shoulder and sideslopes	1-7%; 3-15%	Kofa Region—East arm	Slight	None
Cristobal family- Gunsight family Complex	Fan Terraces; crest/summit and sideslopes	1-3%; 3-15%	All regions	Slight; high in disturbed areas	None; moderate in disturbed areas
Gilman family- Harqua family- Glenbar family Complex	Mixed stream alluvium; floodplains and basin floor	0-2%	Eastern Kofa Region; Northern Cibola Region	Medium to high in floodplains; slight on basin floor	Medium to high in floodplains; none on basin floor
Gunsight family- Chuckawalla family Complex	Fan Terraces; summit/shoulder and sideslopes	1-7%; 3-15%	All regions	Slight	None
Lithic Torriorthents and Typic Torriorthents	Hills and mountains	15-60%	All regions	Sight	None
Riverbend family- Carizzo family Complex	Stream Terraces and Floodplains	1-3%	All regions	Slight	None; very slight in disturbed areas
Superstition family- Rositas family Complex	Relic beach terraces and dunes	1-10%; 2-15%	Laguna Region	Slight	Very high; extremely high in disturbed areas
Tucson family- Tremant family- Antho family Complex	Alluvial fans	1-2%	Eastern Kofa Region; Northern Cibola Region	Moderate to high	Very slight; high in disturbed areas

Source: Natural Resources Conservation Service (NRCS), 1991

and vertical distribution of the dusts over time form into well-developed soil horizons. The upper horizons have a large percentage of fine-grained material and are underlain by the reddish, gravel-rich Bw horizon (Caldwell et al., 2008). These fine-grained arid soils have high porosities and pronounced secondary structure (Berli et al., 2007).

Hardpans, desert pavements, biological soil crusts, and vegetation naturally protect the soils of YPG from erosion. When these protective surfaces are disturbed, soil erosion can be

rapid, particularly in sloped areas. Winds and occasional heavy rain are the primary causes of erosion on YPG (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The extensive porous and secondary structure of the Av horizon collapses quickly upon disturbance, resulting in high dust emissions (Caldwell et al., 2008). The Av horizon is also predominantly clay and silt materials and could be more susceptible to fluvial erosion once the desert pavement is disturbed. A recent study of desert shrubs along first-order streams found an accumulation of high silt and clay soils underlying the upper channels. This accumulation was attributed to fluvial erosion from nearby plant scars, or disturbance to desert pavement caused by plant mortality (McDonald et al., 2004). The same study also found that the infiltration rate increased and the runoff decreased once desert pavement was disturbed. This change in soil characteristics had a direct negative impact on the surrounding vegetation communities, which is further discussed in Section 3.18.

3.15.2 Environmental Consequences

This section discusses direct, indirect, and cumulative impacts to soils that may result from the No Action Alternative and the Proposed Action. The types of impacts considered in this soils impact analysis include:

- Permanent loss of native soil, which includes loss of soils due to direct impacts such as creation of impervious surface area, excavation, or placement of fill material.
- Soil compaction, which could result from use of heavy equipment during construction or from off-road testing of large military equipment. Compaction can adversely affect soil functions, including the ability to filter water, resist erosion, or support native vegetation.
- Wind erosion, which includes loss of the upper soil horizons by wind action on exposed soils or across areas where desert pavement is disturbed or removed.
- Water erosion, which includes loss of the upper soil horizons by runoff across exposed soils, erosion from areas where desert pavement is disturbed or removed, or increased runoff as a result of increased impervious area.
- Soil instability, which could result from testing and training activities that result in loss of vegetative cover or desert pavement and that would likely contribute to subsequent conditions prone to wind and/or water erosion.
- Beneficial impacts, which could result from actions that reduce or eliminate the potential for soil disturbance during testing and training activities.

Contamination of native soils from hazardous materials, including POLs and explosives, also would represent an impact to soils, but these impacts are discussed under hazardous materials (Section 3.9) rather than in this section.

Indirect impacts to other resource areas could result from soil disturbance, including air quality (Section 3.2), cultural resources (Section 3.4), vegetation (Section 3.18), and water quality (Section 3.20). Such impacts are discussed in those sections, as appropriate.

3.15.2.1 Significance Criteria

The significance criteria used to assess impacts to soils are:

- Negligible (less than significant) – Activities that have barely perceptible impacts on soils or erosion potential
- Minor to Moderate (less than significant) – Activities that could cause soil erosion but in areas where management practices are sufficient to minimize the effects
- Minor to Moderate (less than significant) – Activities that would disturb less than 25,000 ft² of desert pavement
- Minor to Moderate (less than significant) – Activities that would disturb and permanently unstabilize less than 25,000 ft² of highly erodible soils
- Severe (significant) – Activities that would result in uncontrolled and irreparable erosion (in areas where management practices are insufficient to minimize the effects)
- Severe (significant) – Activities that would result in changes to native soils that would preclude the restoration of native plant communities in a contiguous area greater than 5 ac
- Severe (significant) – Activities that would result in the disturbance or loss of a contiguous area of more than 25,000 ft² of desert pavement in an undeveloped area

3.15.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, continuing mission operations would result in impacts to soils, as testing and training activities would continue in currently authorized areas at currently authorized levels. Soil impacts could result from off-road vehicle and equipment activity and maneuvers, dismounted maneuvers, set-up for test operations, and live-fire exercises. Impacts of these activities have been previously evaluated under NEPA in the assessments listed in Section 2.3.2.

The evaluations and analyses presented in the NEPA documents listed in Section 2.3.2 provide an assessment of the potential impacts to soils that would result from the No Action Alternative, with testing and training continued at current levels and no new construction. The analyses presented in the NEPA documents listed above are incorporated into this FPEIS by reference.

Vehicular studies were conducted at existing YPG dust courses (Caldwell et al., 2008) and in areas of undisturbed desert pavement at YPG (Berli et al., 2007) to further evaluate the impact of disturbing desert pavement.

The objectives of the Caldwell et al. (2008) study were to characterize the current dust courses at YPG to gain a better understanding of their current fine-grained content and assess the overall sustainability of high dust potential soils needed for military testing. Dust courses are generally short ovals constructed on Cristobal-Gunsight desert pavements. The three dust courses at YPG used in the study include the active Kofa and Cibola courses and the retired Muggins Mesa course. Soil samples were collected from the test track, from adjacent undisturbed soils, and from test vehicle exteriors. The results indicated that the secondary structure of the Av horizon is easily destroyed by vehicular traffic, resulting in dust emissions necessary for military testing. However, routine testing and surface preparation have eroded and mixed the top layer with the lower B horizon, and thus decreased the dust potential of the course. As a result, desert pavement is considered non-sustainable for dust track courses. The construction of additional dust tracks is not included

in the Proposed Action. However, the study recommended that future dust tracks be constructed in active distal fan environments found on gentler- sloped alluvial environments that provide a sustainable dust supply.

The Berli et al. (2007) study aimed to model the deterioration of fine-textured desert pavement due to heavy vehicle traffic. Two models were used to predict rut formation from the eight-wheeled tactical “Stryker” vehicle on desert pavements at YPG. For model evaluation, traffic experiments at YPG were performed to measure rut depth and soil bulk density based on the number of “Stryker” vehicle passes. The study found that rut formation was a result of two processes: (1) compaction of underlying soil and (2) wear of the soil surface due to abrasion by the tire. In the first vehicle pass, compaction was probably the dominant rut forming process, while for subsequent passes abrasion of the soil surface controlled rut formation. For multiple passes, a simple linear rut depth versus vehicle pass model is most appropriate. The rut depth and erosion potential increase as the number of vehicle passes increases.

Range sustainability on YPG is managed through the ITAM program, which is implemented to maintain conditions that realistically simulate conditions in other desert regions for operational testing and training activities. Range management and rehabilitation prevent deterioration of conditions that could adversely affect operational testing and training if allowed to proceed unchecked. Part of range management is recovery of spent metal from munitions testing. Use of vehicles to retrieve scraps of metal results in minor soil disturbance, but the action removes a potential source of contamination as metal and remnant MCOCs on the metal are removed from the range.

3.15.2.3 Impacts of the Proposed Action/Preferred Alternative

The analysis of potential impacts to soils as a result of implementing the Proposed Action is based on the difference in impacts that would occur under the Proposed Action compared to those that would occur under the No Action Alternative. Potential impacts to soils could occur from the following activities:

- Building/facility construction
- Utility infrastructure installation
- Off-road vehicle and equipment testing
- Dismounted maneuver activities
- Munitions testing
- Live-fire training and operational testing
- DZ establishment
- TGP establishment

There would be yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically. As a result, there would be no increase in the potential impacts to soils from testing and training activities in LTAs. Because testing and training activities in LTAs would be spread over a larger area and be more dispersed, the potential for impacts to soils may be reduced under the Proposed Action.

Where soils that are susceptible to wind erosion are disturbed, increased wind erosion could occur and would have the potential to create dust and contribute to PM₁₀ in the air.

Increased dust generation could contribute to air quality impacts, which are discussed in Section 3.2.

Wildfire could result in indirect impacts to soils as a result of increased erosion following removal of vegetation by fire. Exposed soils would experience greater impacts from precipitation, and root systems of plants killed by fire would no longer bind soils. The potential for wildfire to impact soils would be greatest in the Cibola and Kofa Regions, where wildfires are allowed to burn due to the risk to firefighters from UXO. Wildfires in the Laguna Region are suppressed and do not substantially alter desert vegetation, so increased erosion potential as a result of wildfires would not be expected in the Laguna Region. Use of the new or expanded munitions impact areas could result in increased potential for wildfire ignition, which could result in increased risk to vegetation and a higher potential for soil erosion impacts. Clearing for TGP and airfield/UAS support would create areas with little or no fuel load and would likely reduce the potential for wildfire to spread through these areas, which could result in a long-term benefit to soils.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). This could incrementally add to other projects on YPG that create soils disturbance and lead to minor cumulative impacts to soils.

The following sections discuss the potential impacts to soils that could result in each of the three areas on YPG. Mitigation measures are common to all three areas of YPG and are addressed in Section 3.15.2.5.

Laguna Region. Within the Laguna Region, new building/facility construction, airfield runway/taxiway construction/improvement, roadway improvements, and ACP improvements would be the primary activities that would cause impacts to soils. Limited additions to utility infrastructure would occur in the Laguna Region and these would have minor impacts to soils. Expanded dismounted maneuver areas and new vehicle test courses are proposed for parts of the Laguna Region, and the subsequent use of these areas could impact soils. A new DZ is proposed for the Laguna Region. Figure 3-4 shows the distribution of soils types on YPG.

Most proposed new building and facility construction would occur in the Laguna Region. Site preparation for construction of buildings would disturb soils. Additional impervious areas would be created through construction, with the potential for increased stormwater runoff. Scour from erosion as a result of increased runoff could result in severe soil loss along flow paths in some areas.

Proposed new facility construction occurring in areas with Cristobal family-Gunsight family complex soils would result in the most severe soil impacts. The Cristobal family-Gunsight family has high wind and moderate water hazards in disturbed areas. In the Laguna Region, approximately 55 ac of new construction is proposed in locations containing the Cristobal family-Gunsight family soils. The Superstition family-Rositas family complex also has high wind erosion hazards, particularly when disturbed. Approximately 25 ac of new

construction is proposed in locations containing the Superstition family-Rositas family complex soils.

The proposed long-term project at CDH (L103) would result in approximately 18 ac of construction impacts on highly erodible Cristobal family-Gunsight family soils. Two additional proposed CDH projects (L007 and L008) would occur in a location containing both Cristobal family-Gunsight family and Superstition family-Rositas family soils. These projects would result in 10 ac of construction disturbance. Soils would be most susceptible to erosion during construction activities and appropriate BMPs, as discussed above, would be implemented to minimize the potential for severe impacts.

There would be potential for increased runoff from the approximately 125 ac of new impervious area. Appropriate post-construction stormwater controls would be implemented to minimize the potential for increased runoff and erosion (see Section 3.20). Without appropriate control measures, increased runoff could result in increased erosion, which could then remove native soils through scour. The potential loss of native soils through scour from erosive water flow could extend off-post and affect erodible soils on adjacent downstream properties.

Electrical transmission and telecommunications lines would be installed at seven locations in the Laguna Region. The proposed runway extension (L002) would include the installation of power lines, which would occur on Superstition family-Rositas family erodible soils. In areas with erodible soils, all transmissions lines would be installed aboveground and impacts would be minor. There would be potential for minor soils impacts to occur at each of the seven sites along the entire length of utility line installation if these lines were installed belowground. Impacts to soils from utility line installation would be minor with implementation of BMPs.

One area (L014), encompassing approximately 162 ac, would be cleared for creation of UAS launch/recovery areas. The vegetation removal would result in increased potential for soil erosion. Approximately 6 ac are proposed in a location with highly erodible Cristobal family-Gunsight family complex soils. The proposed sites are on the relatively flat basin floor where water erosion would be minimal, but wind erosion hazards are likely. This acreage would not be managed through the ITAM program because it is not associated with training activities. Impacts to soils from creation of UAS launch/recovery areas would be minor with implementation of BMPs.

Levels of dismounted maneuver testing and training would be expected to fluctuate between the historical maximum and minimum levels, and years with high levels of dismounted maneuver testing and training could occur in the Laguna Region with the creation of new or expanded LTAs through proposed activities L019, L030, L032, and L033. The LTA at West LA would be expanded by approximately 6,520 ac to connect with K-9 Village. Battalion-level dismounted maneuvers simulating deployment in open desert to achieve an urban target in either the West LA or K-9 Village MOUT areas would be conducted. The LTA at Muggins/Middle Mountain would be expanded up to approximately 6,331 ac under the Preferred Alternative (reduced from the 16,640 ac originally proposed). Additional expanded dismounted maneuver areas would be established in the Laguna Region, which would cover approximately 1,970 ac. Approximately 1,480 ac of dismounted maneuver area is proposed in locations containing the Cristobal family-Gunsight family soils. Approximately 2,943 ac of dismounted

maneuver area is proposed in locations containing the Superstition family-Rositas family complex soils.

In addition, new vehicle test courses would be established within approximately 9,040 ac in the Laguna Region (L037, L038, and L039). Discernible trails would be established, minimizing the potential for soil compaction and for exposing soils outside the boundary of the vehicle test courses. However, when active vehicle testing is not ongoing, these vehicle test courses may be used to conduct blended testing or dismounted maneuver training. Approximately 1,430 ac of the vehicle test courses is proposed in locations containing the Cristobal family-Gunsight family complex soils. Approximately 157 ac of vehicle test courses is proposed in locations containing the Superstition family-Rositas family complex soils. The nature of dismounted maneuvers, with Soldiers moving in a diffuse pattern across the landscape rather than as a cluster, would reduce the potential for soils disturbance and erosion. Impacts to soils from these training activities would be expected to be long-term and minor with continued implementation of the ITAM program.

Creation of a DZ would involve activity-related land-disturbing activities on approximately 45 ac in the Laguna Region (L040). The vegetation would not be entirely cleared in this area, but would be disturbed and likely trampled during testing and training activities. Disturbance to vegetation and soils would generally be caused by objects falling directly onto the ground by parachute and vehicles retrieving dropped payloads. The proposed DZ is in Superstition family-Rositas family complex soils. Impacts to soils from testing and training activities would be expected to be long-term and minor with use of appropriate BMPs and continued implementation of the ITAM program.

No munitions testing occurs in the Laguna Region and no TGPs would be established in this region. No new off-road vehicle testing in the Laguna Region would occur under the Proposed Action. These activities would not affect soils in the Laguna Region.

Implementation of the Proposed Action would likely result in minor impacts to disturbed soils that are not susceptible to erosion and moderate impacts to highly erodible soils. There would also be potential for interaction of activities conducted in the Laguna Region with activities proposed in other areas of YPG. Continued implementation of the YPG INRMP and the ITAM program would reduce the potential for severe soil impacts and for incremental interaction with other on-post projects and no significant cumulative impacts would be expected.

Cibola Region. The amount of proposed new building/facility construction in the Cibola Region is much less than that proposed for the Laguna Region. Most of the proposed building/facility construction for the Cibola Region is new construction rather than replacement of existing structures and there would be potential for disturbance to soils from construction activities. Numerous airfields across the Cibola Region are proposed for runway expansion and new supporting infrastructure with the potential for impacts to soils at each site. Multiple areas are proposed for use as munitions impact areas, either new areas or expansions of existing munitions impact areas with potential for long-term impacts to soils in these areas. Utility infrastructure extensions would occur throughout the Cibola Region and could have minor impacts to soils. New dismounted maneuver areas and vehicle test courses are proposed for parts of the Cibola Region and the subsequent use of these areas could impact soils. New DZs are proposed for the Cibola Region and 23 TGPs would be established to support testing activities. Both of these activities would affect soils.

Proposed new construction activities occurring in areas with Cristobal family-Gunsight family complex soils would have the greatest potential for severe soil impacts. The Cristobal family-Gunsight family complex has high wind and moderate water hazards in disturbed areas. Approximately 28 ac of proposed new construction, including the creation of the North UAV complex and access roads, is proposed in locations containing the Cristobal family-Gunsight family complex soils (28 ac) and the Gilman family-Harquua family-Glenbar family complex (<1 ac). Soils impacts from construction in this complex would be moderate with use of appropriate BMPs.

The Gilman family-Harquua family-Glenbar family complex also has moderate to high water and wind erosion hazards in floodplains. The new construction and impact areas proposed on this soil type would occur on the basin floor where erosion hazards would be negligible. Soils impacts from construction in this complex would be minor with use of appropriate BMPs.

Soils would be most susceptible to erosion during construction activities. Following construction, cleared areas converted to impervious areas would have no potential for water or wind erosion. There would be potential for localized increased runoff from the approximately 130 ac of new impervious area, which could result in increased runoff and increased erosion. Depending on the location of the new impervious area, the scour from erosive water flow could extend off-post and affect soils on adjacent downstream properties.

Expansion or creation of DZs would involve activity-related land-disturbing activities on approximately 980 ac in the Cibola Region. The vegetation would not be entirely cleared in these areas, but would be disturbed and likely trampled during testing and training activities. Disturbance to vegetation and soils would generally be caused by objects falling directly onto the ground by parachute and vehicles retrieving dropped payloads. The sites of all the existing and many of the proposed DZs (approximately 510 ac) are in areas with highly erosive Cristobal family-Gunsight family complex and Gilman family-Harquua family-Glenbar family soils. The Gilman family-Harquua family-Glenbar family complex soils are only erodible in floodplain areas. DZs would be located on the flat terrain of the basin floor where erosion impacts to this soil type would be negligible. Water erosion impacts in this area would also be negligible. Disturbed soils of the Cristobal family-Gunsight family complex would be susceptible to wind erosion. There would be no direct impacts to soils in these areas from the creation of the DZs, but indirect impacts could result from subsequent wind erosion. Impacts to soils from testing and training activities would be expected to be long-term and minor with use of appropriate BMPs and continued implementation of the ITAM program.

New or expanded impact areas would have long-term disturbance to soils from testing and training activities. Approximately 9,100 ac of the proposed 16,300 ac of additional munitions impact areas are sited on highly erodible soils in the southern and northern portions of the Cibola Region. The proposed south Cibola Region munitions impact areas would be located on Cristobal family-Gunsight family complex soils. The proposed impact areas in the north would be located on Cristobal family-Gunsight family complex, Tucson family-Tremont family-Antho family complex, and Gilman family-Harquua family-Glenbar family complex soils. The HE testing areas are proposed on the relatively flat basin floor and impacts to Gilman family-Harquua family-Glenbar family complex soils would be negligible. The Tucson family-Tremont family-Antho family complex has a moderate to high water erosion

hazard and high wind erosion hazard in disturbed areas. Water erosion would also be minimal on the basin floor. Disturbed soils would be susceptible to wind erosion. There would be no direct impacts to soils in these areas from the creation of munitions impact areas. Several existing munitions impact areas, including the Direct Fire Range, Site 10, Rocket and Gun Horizontal Impact Area (CRV-7), and Rocket Alley, are located in south Cibola Region on highly erodible Cristobal family-Gunsight family complex soils. Soils in existing munitions impact areas have not experienced severe impacts during use. Impacts to soils from testing and training activities in new or expanded munitions impact areas would be expected to be comparable to past impacts in munitions impact areas. With continued implementation of the ITAM program, any impacts to soils in new or expanded munitions impact areas would be long-term but minor.

Approximately 250 ac of new munitions impact areas at JERC I, II, and III would be used for inert fire only. There would be no direct impacts to soils in these areas from creation of the munitions impact areas. Soils in inert fire munitions impact areas would be less impacted than soils in explosive fire munitions impact areas, and direct impacts to soils by inert munitions testing would be negligible. There would be potential for long-term indirect impacts should inert munitions degrade and release metals or other constituents of concern to the soil. Impacts associated with metals in soils are discussed in Section 3.9.

Twenty-three new TGPs would be established to meet identified testing and training needs in the Cibola Region. Each TGP would cover an area of up to 2.2 ac. Woody vegetation would be cleared at ground level with minimal soil disturbance to eliminate potential interference with proposed testing and observations. Soil impacts would likely be more severe in areas with highly erodible soils. The potential for increased soil erosion from clearing for TGPs could extend to approximately 50.6 ac in the Cibola Region. Impacts to soils from establishment of TGPs would be minor with implementation of BMPs. No regional cumulative impacts to soils beyond the boundary of YPG would be expected.

Six areas, encompassing approximately 530 ac, would be cleared for creation of UAS launch/recovery areas. The vegetation removal would result in increased potential for soil erosion, as discussed for TGPs. Three of the sites, namely C022 (approximately 16 ac), C023 (approximately 23 ac), C033 (approximately 90 ac), are proposed in a location with highly erodible Cristobal family-Gunsight family complex soils. One of the sites (C033—approximately 55 ac) is proposed in a location with Gilman family-Harqua family-Glenbar family complex soils. The proposed sites are on the relatively flat basin floor where water erosion would be minimal, but wind erosion hazards are likely. This acreage would not be managed through the ITAM program because it is not associated with training activities. Impacts to soils from creation of UAS launch/recovery areas would be minor with implementation of the BMPs.

Electrical transmission and telecommunications lines would be installed at 20 locations in the Cibola Region. For analysis purposes, it is assumed that utility line extensions would be an equal mix of above-ground and below-ground infrastructure. In areas with highly erodible soils, utility infrastructure would be installed above-ground. Soil impacts from aerial lines would be limited to the footprint of the support poles and would be negligible to minor. Impacts to soils from utility line installation in other soils would be minor.

New and expanded dismounted maneuver areas would be established in the Cibola Region, which would cover approximately 66,400 ac. In addition, a new vehicle test course would be

established within an area up to 4,644 ac in the Cibola Region. Discernible trails would be established, minimizing the potential for soil compaction and for exposing soils outside the boundary of the vehicle test course. However, when active vehicle testing is not ongoing, the area may be used to perform blended testing or dismounted maneuver training at the vehicle test course. Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and associated with initial troop deployment.

Approximately 9,170 ac of the proposed maneuver areas and vehicle test courses would be located on the Cristobal family-Gunsight family complex and approximately 3,990 ac would be located on the Gilman family-Harqua family-Glenbar family complex soils. The nature of dismounted maneuvers, with Soldiers moving in a diffuse pattern across the landscape rather than as a cluster, would reduce the potential for soils disturbance and erosion. Impacts to soils from dismounted maneuver training would be expected to be long-term and minor with continued implementation of the ITAM program.

The LTAs proposed by activities C060 and C064 would be in areas where UXO may occur. Dismounted maneuvers in these LTAs would be restricted to established trails and roads unless UXO clearance was completed in advance of the maneuvers. This would result in negligible impacts to soils from dismounted maneuvers in these two LTAs.

Implementation of the Proposed Action would likely result in minor impacts to soils that are not susceptible to erosion and moderate impacts to highly erodible soils that are disturbed. There would also be potential for interaction of activities conducted in the Cibola Region with activities proposed in other areas of YPG. Continued implementation of the YPG INRMP and ITAM program would reduce the potential for severe soil impacts and for incremental interaction with other on-post projects and no significant cumulative impacts would be expected.

Kofa Region. New building/facility construction in the Kofa Region would occur at fixed GPs, where previous clearing would limit the potential for additional impacts to soils. Additional construction would occur at new training complexes. New dismounted maneuver areas and a DZ are proposed for parts of the Kofa Region and the subsequent use of these areas could impact soils. Utility infrastructure would be extended to six new locations in the Kofa Region and could impact vegetation. Multiple areas are proposed for use as munitions impact areas, either new areas or expansions of existing munitions impact areas with potential for long-term impacts to soils in these areas.

Proposed construction activities would result in clearing of approximately 240 ac of desert habitat in the Kofa Region, with all vegetation removed from this acreage as a result. New construction, including paving, creation of a 162-ac UAS launch/recovery area near SWTR, new maneuver areas, the East Kofa Operations Center, and the training complex in the northern part of East Arm, would convert approximately 54 ac of the Kofa Region to impervious surfaces.

Approximately 220 ac of proposed new construction and paving, including the creation of a UAS launch/recovery area near SWTR and the East Kofa Operations Center, is proposed in locations containing the Cristobal family-Gunsight family complex soils (37 ac) and the Gilman family-Harqua family-Glenbar family complex (184 ac). The Cristobal family-Gunsight family soil complex has high wind and moderate water hazards in disturbed areas and would be the most susceptible to potentially severe soil impacts during construction.

Soils impacts from construction in this complex would be moderate with use of appropriate BMPs.

The Gilman family-Harquua family-Glenbar family complex also has medium to high water and wind erosion hazards in floodplains. The new construction and impact areas proposed on this soil complex would occur on basin floors where erosion hazards would be negligible. Soils impacts from construction in this complex would be negligible to minor with use of appropriate BMPs.

Soils would be most susceptible to erosion during construction activities, and appropriate BMPs would be implemented to minimize the potential for severe impacts. Following construction, cleared areas converted to impervious areas would have no potential for wind erosion. There would be potential for localized increased runoff from the approximately 16 ac of new impervious area, which could result in increased runoff and increased erosion. Depending on the location of the new impervious areas, the scour from erosive water flow could extend off-post and affect soils on adjacent downstream properties.

Expansion or creation of DZs would involve activity-related land-disturbing activities on approximately 305 ac in the Kofa Region. The vegetation would not be entirely cleared in these areas, but would be disturbed and likely trampled during testing and training activities. Disturbance to vegetation and soils would generally be caused by objects falling directly onto the ground by parachute and vehicles retrieving dropped payloads. The sites of the two proposed DZs (approximately 245 ac) are in areas with highly erosive Cristobal family-Gunsight family complex soils. DZs are located on the flat terrain of the basin floor where water erosion impacts would be negligible. Disturbed soils of the Cristobal family-Gunsight family complex would be susceptible to wind erosion. There would be no direct impacts to soils in these areas from the creation of the DZs, but indirect impacts could result from subsequent wind erosion. Impacts to soils from testing and training activities would be expected to be long-term and minor with use of appropriate BMPs and continued implementation of the ITAM program.

There are multiple locations in the Kofa Region where new munitions impact areas would be established or where existing munitions impact areas would be expanded. All of the new and expanded munitions impact areas (26,824 ac under the Preferred Alternative) in the Kofa Region would be used for inert and explosive fire. Approximately 8,311 ac of the proposed munitions impact areas would be located on the Cristobal family-Gunsight family complex and approximately 8,920 ac would be located on the Gilman family-Harquua family-Glenbar family complex soils. There would be no direct impacts to soil in these areas from the creation of the munitions impact areas. After the munitions impact areas are established, there would be the potential for episodic disturbance to soils from munitions testing and operational testing or training activities that would fire into these areas. Soils in existing munitions impact areas have not experienced severe impact during use. Impacts to soils from testing and training activities in new or expanded munitions impact areas would be expected to be comparable to past impacts in munitions impact areas. With continued implementation of the ITAM program, any impacts to soils in new or expanded munitions impact areas would be long-term and minor. There would be potential for long-term indirect impacts should inert munitions degrade and release metals or other constituents of concern to the soil. With munitions testing in more areas, the activities associated with recovery of metal from munitions tests would occur in more areas and could increase. Soil

disturbance associated with vehicle use to retrieve scraps of metal also could increase, but any impacts would be expected to remain minor.

New dismounted maneuver areas would be established in the Kofa Region, which would cover approximately 53,180 ac (51,354 ac under the Preferred Alternative). Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and associated with initial troop deployment. Approximately 13,110 ac of the proposed maneuver areas would be located on the Cristobal family-Gunsight family complex and approximately 5,600 ac would be located on the Gilman family-Harquua family-Glenbar family complex soils. The nature of dismounted maneuvers, with Soldiers moving in a diffuse pattern across the landscape rather than as a cluster, would reduce the potential for soils disturbance and erosion. Impacts to soils from dismounted maneuver training would be expected to be long-term and minor with continued implementation of the ITAM program.

Proposed activity K026 would overlap extensively with a proposed munitions impact area. Dismounted maneuvers would be limited to existing roads in this LTA unless UXO clearance is completed in advance of maneuvers. Therefore, use of the LTA that would result from K026 would not be expected to have more than negligible impacts to soils.

Electrical transmission and telecommunications lines would be installed at four locations in the Kofa Region. For analysis purposes, it is assumed that utility line extensions would be an equal mix of above-ground and below-ground infrastructure. In areas with highly erodible soils, utility infrastructure would be installed above-ground. Soil impacts from aerial lines would be limited to the footprint of the support poles and would be negligible to minor. Impacts to soils from utility line installation in other soils would be minor.

Implementation of the Proposed Action would likely result in minor impacts to soils that are not susceptible to erosion and moderate impacts to highly erodible soils that are disturbed. There would also be potential for interaction of activities conducted in the Kofa Region with activities proposed in other areas of YPG. Continued implementation of the YPG INRMP and the ITAM program would reduce the potential for severe soil impacts and for incremental interaction with other on-post projects and no significant cumulative impacts would be expected.

3.15.2.4 Impacts Summary

Impacts to soils on YPG would typically be short-term during construction, with the potential for long-term impacts as a result of increased erosion due to increased runoff rates or altered runoff flow patterns associated with land clearing, construction grading, and increased impervious area. The potential for impacts would be greatest in areas with highly erodible soils.

There would be unavoidable impacts to soils under the Proposed Action. Short-term impacts from construction and paving would occur on approximately 360 ac of soil (143 ac of highly erodible soils). Runoff from the newly created impervious areas (310 ac) could cause long-term soil impacts to the surrounding areas. Up to 161,560 ac of soil (62,000 ac of highly erodible soils) would be disturbed by maneuver areas and vehicle test courses. Approximately 1,330 ac (800 ac of highly erodible soils) would be disturbed by DZs. Approximately 1,035 ac of soil (600 ac of highly erodible soils) would be cleared for UAS launch/recovery areas and TGPs. These areas would have long-term potential for increased

erosion. Approximately 43,124 ac (26,330 ac of highly erodible soils) would be converted to munitions impact areas and could include localized areas with increased erosion potential from explosion cratering. The new munitions impact areas also would have the potential for long-term impacts to soils from contamination from metals and other potential contaminants following degradation of bullets and other munitions components.

Wildfire could result in indirect impacts to soils as a result of increased erosion following removal of vegetation by fire. Exposed soils would experience greater impacts from precipitation, and root systems of plants killed by fire would no longer bind soils. The potential for wildfire to impact soils would be greatest in the Cibola and Kofa Regions, where wildfires are allowed to burn due to the risk to firefighters from UXO. Wildfires in the Laguna Region are suppressed and do not substantially alter desert vegetation, so increased erosion potential as a result of wildfires would not be expected in the Laguna Region. Use of the new or expanded munitions impact areas could result in increased potential for wildfire ignition, which could result in increased risk to vegetation and a higher potential for soil erosion impacts. Clearing for TGPs and airfield/UAS support would create areas with little or no fuel load and would likely reduce the potential for wildfire to spread through these areas, which could result in a long-term benefit to soils.

Installation of utility infrastructure would result in disturbance to approximately 20 ac. The potential for increased erosion would be long-term because of the very slow recovery of desert vegetation following disturbance. Proposed telecommunications utility infrastructure would be installed above-ground in areas with highly erodible soils to minimize the potential for increased erosion. Soil impacts from aerial lines would be negligible and limited to the footprint of the support poles.

Appropriate construction BMPs would be implemented to stabilize disturbed soils and minimize the potential for increased erosion. Construction BMPs also would reduce the potential for increased stormwater runoff. YPG would continue implementation of its ITAM to maintain vegetation and soils in proposed testing and training areas. Appropriate post-construction stormwater controls (see Section 3.20) would be implemented to minimize the potential for long-term increased erosion potential from increased stormwater runoff during operations. A mitigation summary is provided in Section 3.15.2.4.

There would be potential for interaction of activities conducted under the Proposed Action and other past, present, and reasonably foreseeable activities, including the commercial-scale renewable solar electrical energy generation facilities, to create increased soil erosion on YPG. Impacts to soils from establishment of TGPs would be minor with implementation of BMPs. There also could be minor cumulative impacts to soils on YPG from multiple TGPs established through time, but no regional cumulative impacts to soils beyond the boundary of YPG would be expected. The YPG INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects. Cumulative impacts would be expected to be minor.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. Approximately 115 ac of the 1,675-ac project area would be completely cleared of vegetation. The project area is entirely within the Superstition-Rositas series, which exhibits a moderate to high susceptibility to water and wind erosion. Should

the project be constructed, appropriate erosion control measures would be implemented. Any contribution to cumulative impacts to soils would be minor.

Construction, operation, and maintenance of the five additional BLM solar projects would likely contribute to regional cumulative impacts to soils. While specific impacts are unknown at this time, it is likely that a substantial acreage would be cleared for each project, increasing the susceptibility of the soils to wind and run-off erosion. It is likely that BLM would require appropriate BMPs to minimize the potential for erosion. Therefore, any contribution to cumulative impacts to soils would be expected to be minor.

The potential for off-post past, present, and reasonably foreseeable actions to interact with the activities of the Proposed Action with regard to impacts to soils would be limited to the potential for increased erosion off-post as a result of Proposed Action activities. Other soils impacts resulting from the Proposed Action would be confined within the boundaries of YPG. Appropriate construction BMPs and post-construction stormwater controls would be implemented to minimize the potential for off-post impacts from increased runoff resulting from Proposed Action activities.

3.15.2.5 Mitigation

Mitigation measures, including measures implemented to avoid impacts, would address the potential for increased erosion from either wind or water. All disturbed soils would have a greater potential for erosion because the soils would be directly exposed to the effects of precipitation and wind. Mitigation measures would include, but would not be limited to, planning to avoid disturbance of highly erodible soils, construction BMPs to minimize the potential for onsite erosion, construction and post-construction stormwater controls, and continued implementation of the ITAM program and the INRMP. These measures are discussed below.

Planning Site Selection and Site design. During site selection and site design, soil erosion potential would be considered and activities that would cause loss of vegetation or soil disturbance or that would create new impervious areas would be identified; to the extent practical, such activities would be placed in areas where onsite and downslope soils are not susceptible to erosion. It is not possible to completely avoid highly erodible soils due to the sheer volume of activities proposed and the dispersed occurrence of such soils across the YPG landscape. TPG would minimize the location of activities that could lead to increased erosion potential on highly erodible soils. Further, efforts would be made in site designs to result in conditions where post-disturbance site hydrology is unchanged with respect to stormwater runoff velocities and volumes.

Construction BMPs to Minimize Onsite Erosion. During construction, BMPs would be used to stabilize disturbed soils, which would minimize the potential for soil erosion. Construction BMPs to minimize the potential for erosion from wind and water would comply with the *ADOT Erosion and Pollution Control Manual* (2005). BMPs that could be used include, but would not be limited to, the following:

- Preservation of existing vegetation—existing vegetation provides natural protection against soil erosion and would be preserved if practicable.
- Mulching—mulch would be applied to disturbed soil to prevent erosion during and following precipitation events.

- Slope Protection—several measures could be used to minimize erosion from disturbed slopes, which could consist of geotextiles, vegetation, mulch, or a combination.
- Silt Fence—a sediment barrier would be used where necessary to prevent the movement of sediment from disturbed areas.

Additional BMPs would be implemented to minimize the potential for increased wind erosion during construction and operation. BMPs that could be used to minimize the potential for wind erosion would include, but would not be limited to, the following (CASQA, 2003):

- Wet Suppression—watering prevents dust and wind erosion only for a short period and should be applied at least daily to be effective. Overwatering may also cause surface water erosion.
- Chemical Dust Suppression—chemicals would be chosen appropriately depending on the soil type, temperature, humidity, and wind velocity. The chemicals may also interfere with the soil's infiltration abilities, thus impacting re-vegetation on the site.
- Gravel or Asphalt—gravel could be applied to disturbed soils to prevent wind erosion.
- Covering construction stockpiles with tarps and canvases

Construction and Post-construction Stormwater Controls. There would be potential for localized increased runoff from new impervious areas. Without appropriate control measures, increased runoff could affect downstream areas, including off-post lands, by creating scour that could remove soils from uplands along washes. Stormwater controls would be implemented to facilitate infiltration and reduce the potential for scour. These controls could include, but would not be limited to:

- Use of temporary detention areas with controlled outflow
- Preservation of existing vegetation
- Mulching
- Site design to direct stormwater runoff away from washes
- Incorporation of constructed detention/infiltration areas into site designs
- Incorporation of designs to capture stormwater for subsequent use
- Use of pervious surfaces to the extent practicable
- Use of semi-pervious surfaces where appropriate

ITAM and INRMP. The YPG ITAM program is implemented to maintain conditions that realistically simulate conditions in other desert regions for operational testing and training activities. Range management and rehabilitation prevent deterioration of conditions that could adversely affect operational testing and training if allowed to proceed unchecked. Substantial soil erosion from ongoing training can lead to a loss of realism. Continued implementation of the ITAM program would address soil erosion so that it would not negatively affect the mission.

The INRMP is implemented to maintain or restore the condition of natural resources on YPG. By promoting vegetation and soil health, continued implementation of the INRMP reduces the potential for erosion from exposed soils and also reduces the potential for wildfire from build-up of excessive fuel loads.

3.16 Threatened or Endangered Species and Species of Concern

3.16.1 Existing Conditions

Threatened, endangered, or sensitive (TES) species of concern include federally listed species protected by the ESA of 1973 (16 U.S.C. § 1531 et seq.), species listed as Wildlife of Special Concern by the AZGFD, and other species with a conservation status of concern, including species identified by USFWS and the BLM. In addition, wild horses and burros, which are protected under the Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195) as amended, occur on YPG.

The ESA was established to provide a program for the conservation of TES species and the habitats in which they occur, which is administered by the USFWS for non-marine species. The ESA requires federal agencies to ensure that their actions are not likely to jeopardize the existence of any listed species or result in the destruction or negative modification of designated critical habitat of listed species.

The bald eagle was delisted under the ESA in 2007 (50 CFR 17). Bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and also by the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712 as amended).

Because the only occurrences of federally-listed species within the boundaries of YPG are transient sightings incidental to movement of animals and because no federally-listed species use YPG for required life cycle needs, YPG has not needed to consult formally with USFWS for a BO regarding ongoing activities on the installation. Due to the reintroduction of an experimental population per Section 10(j) of the ESA of the Sonoran pronghorn (*Antilocapra americana* ssp. *sonoriensis*) on Kofa NWR, YPG entered into formal consultation with USFWS and received a BO on September 9, 2014. This BO is discussed under the evaluation of this species. YPG has consulted and received BOs regarding activities conducted at off-post locations.

3.16.1.1 Species Listed or Proposed for Listing Under the Endangered Species Act

Species listed under the ESA that are known to occur in Yuma and La Paz Counties are listed in Table 3-17. The sections following the table describe federally protected species known to occur or with potential to occur on YPG.

TABLE 3-17
Federally Protected Species Known to Occur in Yuma and La Paz Counties, Arizona
Yuma Proving Ground

Common Name	Scientific Name	Status	Habitat
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Delisted, Monitor, WSC	Areas with rocky, steep cliffs, primarily near water, where prey (primarily shorebirds, songbirds, and waterfowl) concentrations are high. Nests are found on ledges of cliffs, and sometimes on man-made structures.
Bonytail Chub ^a	<i>Gila elegans</i>	Endangered, WSC	Warm, swift, turbid mainstem rivers of the Colorado River basin and reservoirs in lower basin. The Colorado River upstream of Imperial Dam has been designated as critical

TABLE 3-17

Federally Protected Species Known to Occur in Yuma and La Paz Counties, Arizona

Yuma Proving Ground

Common Name	Scientific Name	Status	Habitat
			habitat for the bonytail chub (Bureau of Reclamation, 1996). No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The species is not discussed further.
California Brown Pelican	<i>Pelicanus occidentalis californicus</i>	Delisted. Monitor	Coastal land and islands; species found occasionally around Arizona's lakes and rivers. No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The species is not discussed further.
Desert Tortoise, Sonoran	<i>Gopherus morafkai</i> (formerly a distinct population segment of <i>Gopherus agassizii</i>)	Candidate, WSC	Primarily rocky (often steep) hillsides and bajadas of Sonoran desert scrub in Arizona, but may encroach into desert grassland, juniper woodland, interior chaparral habitats, and even pine communities. Washes and valley bottoms may be used in dispersal.
Lesser Long-nosed Bat ^b	<i>Leptonycteris curasoae yerbabuenae</i>	Endangered, WSC	Desert scrub habitat with agave and columnar cacti present as food plants.
Razorback Sucker	<i>Xyrauchen texanus</i>	Endangered, WSC	Riverine and lacustrine areas, including backwaters, generally not in fast-moving water. The Colorado River upstream of Imperial Dam has been designated as critical habitat for the razorback sucker (Bureau of Reclamation, 1996). No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The species is not discussed further.
Roundtail Chub ^a	<i>Gila robusta</i>	Candidate	Cool to warm waters of rivers and streams, often occupying the deepest pools and eddies of large streams. No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The species is not discussed further.
Sonoran Pronghorn ^b	<i>Antilocapra americana</i> ssp. <i>sonoriensis</i>	Endangered, WSC The pronghorn released on Kofa NWR are considered a non-essential experimental population as per Section 10(j) of the ESA.	Broad intermountain alluvial valleys with creosote bush-bursage and palo verde-mixed cacti associations.
Southwestern Willow Flycatcher	<i>Empidonax trillii eximus</i>	Endangered, WSC	Cottonwood/willow and tamarisk vegetation communities along rivers and streams. No suitable habitat for this species occurs on YPG and this species would not be affected

TABLE 3-17

Federally Protected Species Known to Occur in Yuma and La Paz Counties, Arizona

Yuma Proving Ground

Common Name	Scientific Name	Status	Habitat
			by the Proposed Action. The species is not discussed further.
Sprague's Pipit	<i>Anthus spraguei</i>	Candidate	Strong preference to native grasslands with vegetation of intermediate height and lacking woody shrubs. No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The species is not discussed further.
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Candidate, WSC	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries). No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The yellow-billed cuckoo is not discussed further.
Yuma Clapper Rail	<i>Rallus longirostris yumaensis</i>	Endangered, WSC	Fresh water and brackish marshes. No suitable habitat for this species occurs on YPG and this species would not be affected by the Proposed Action. The Yuma clapper rail is not discussed further.

Sources: USFWS Arizona Ecological Services (USFWS AES), 2009a; USFWS AES, 2009b; USFWS AES, 2010a; USFWS AES, 2010b; USFWS AES, 2010c; USFWS, 2010d; USFWS AES, 2012, Johnson et al., 2006, USFWS, 2005, USFWS, 2009a, USFWS, 2009b.

Notes: ^a Only occurring in La Paz County; ^b Occurring in Yuma County but does not occur on YPG; WSC = Wildlife of Special Concern in Arizona

A plant identified as the endangered Nichol Turk's head cactus (*Echinocactus horizonthalonius* var. *nicholii*) was photographed on YPG in 1995, but voucher specimens were not collected or recorded and the plant has never been relocated. This report may have resulted from observation of an atypical small specimen of another barrel cactus. At present, USFWS does not recognize Nichol Turk's head cactus as occurring in Yuma or La Paz Counties (USFWS AES, 2010a, 2010b). The current species status identifies this species as restricted to three populations in Arizona: in the Vekol Mountains in Pinal County and the Waterman Mountains in north-central Pima County (AZGFD, 2008; USFWS AES, 2009c). Because USFWS considers this species not to occur on YPG and because the initial report has not been confirmed, the Nichol Turk's head cactus is not addressed further in this FPEIS.

The flat-tailed horned lizard (*Phrynosoma mcallii*) was proposed for listing under the ESA. On March 15, 2011, USFWS issued a determination that the listing of the flat-tailed horned lizard as a threatened species under the ESA was not warranted and withdrew its November 29, 1993, proposed rule to list the species under the ESA (USFWS, 2011b). As this species is no longer proposed for listing and because its known range does not extend onto YPG, the flat-tailed horned lizard is not discussed further in this FPEIS.

American Peregrine Falcon. The American peregrine falcon is a large falcon, slate-gray above and pale below, with a mottled appearance on the underside from thin black lines and spots. The peregrine falcon was delisted in 1999, but populations will be monitored by the

USFWS until 2015 (USFWS, 2003). The species occurs from Alaska and extreme western Canada south to the western mountains and can be seen throughout Arizona. This falcon prefers cliffs and steep terrain that are near water. The steep terrain on YPG is not near water, but this habitat is found along the Colorado River. The American peregrine falcon occurs on YPG as an occasional migrant (YPG, 2012b).

Sonoran Desert Tortoise. The Sonoran desert tortoise (formerly a distinct population segment of the desert tortoise, but now recognized as a distinct species [Murphy et al., 2011]) is a candidate species for listing under the ESA. This species is also classified as a Tier 1b Species of Greatest Conservation Need by the AZGFD. The Sonoran desert tortoise has a domed shell, typically 8 to 15 inches high, with a brownish upper shell, a yellowish plastron, stocky forelimbs with large conical scales, and a short tail. This diurnal, solitary species is strictly terrestrial and requires firm but not hard ground to construct burrows, adequate moisture for survival of eggs and young, and grass, cactus, or other low-growing vegetation for food. The tortoise hibernates in the burrow from late fall until spring. Breeding typically occurs in spring and early summer with a clutch size of 2 to 14 eggs and incubation ranging from 90 to 120 days. The Sonoran desert tortoise occurs in southwestern Arizona and Sonora, Mexico (USFWS AES, 2012; YPG, 2012b).

Sonoran desert tortoises live in small distinct groups typically on rocky bajadas and steep slopes. This species has been observed in the East Arm of the Kofa Region and in the Cibola Region of YPG (YPG, 2012b). The Arizona Game and Fish Department (AZGFD) has identified certain areas as primary desert tortoise habitat on and near YPG (Figures 3-5 through 3-7), although the animals have been observed in other areas of YPG.

Approximately 375 square miles of the area designated as primary tortoise habitat occurs in the northern portion of the Cibola Region (Figure 3-6), where a low density population occurs (There have been 11 sightings of individual tortoises in this area.). Approximately 95 square miles identified by AZGFD as primary desert tortoise habitat is within the boundary of the eastern Kofa Region, and there has been one historical tortoise sighting in this area (Figure 3-7). Sonoran desert tortoises are considered susceptible to disease, collecting pressure from the pet trade, poaching, habitat destruction, and population fragmentation due to urbanization, mining, and off-road vehicle activity (USFWS AES, 2012; YPG, 2012b).

YPG has incorporated those portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008; Appendix I) that are consistent with the military mission into management of this species and considers these guidelines to develop appropriate mitigation strategies when evaluating activities.

Lesser Long-nosed Bat. The lesser long-nosed bat is listed as an endangered species under the ESA. The lesser long-nosed bat prefers desert scrub habitat with agave and columnar cacti as food sources. This species roosts during the day in caves or abandoned mines and tunnels and comes out at night to forage for nectar, pollen, and fruit of paniculate agaves and columnar cacti. This bat is migratory and occurs in Arizona only from April through September (USFWS AES, 2010a). This species is not known to occur on YPG, and agave plants, an important food source for the species, are very rare on YPG, making the habitat generally unsuitable. It is very unlikely that the lesser long-nosed bat would occur on YPG.

Sonoran Pronghorn. The Sonoran pronghorn (*Antilocapra americana* ssp. *sonoriensis*) is a subspecies of the American pronghorn that was originally listed as threatened with

extinction under the Endangered Species Preservation Act of 1966 on February 24, 1967. With the passage of the ESA, this subspecies was listed as endangered. The Sonoran pronghorn is a hoofed animal that resembles an antelope. It has a yellowish-tan color with white areas on the rump, throat, sides of the face, and underparts. The horns are black with a single prong. The Sonoran pronghorn is North America's fastest land animal and its speed and eyesight help the animals avoid predators. Flat to rolling topography is the preferred habitat for the subspecies, which includes broad intermountain alluvial valleys with creosote bush-bursage and palo verde-mixed cacti associations (YPG, 2012b). Within its current range, the Sonoran pronghorn generally prefers creosote bush-bursage, palo verde-mixed cacti, and ephemeral wash habitats. According to a model by USFWS, more than 55 percent of YPG (approximately 757 square miles) is potentially suitable habitat for this species (USFWS, 2009c). Generally, bajadas are fawning areas and sandy dune areas provide food on a seasonal basis. Cacti, forbs, and shrubs are important food plants for the Sonoran pronghorn and the fruit of chain-fruit cholla (*Opuntia fulgida*) can be consumed to provide a water source (USFWS, 2009c).

The subspecies is known to inhabit the Barry M. Goldwater Range, Cabeza Prieta NWR, Organ Pipe National Monument, and Mexico. The closest natural population of Sonoran pronghorn is on the Barry M. Goldwater Range, which is across I-8 and approximately 10 miles south of YPG. The interstate highway and the extensive farming along the Gila River Valley effectively prevent movement of this population onto YPG. The other populations are south and east of the Barry M. Goldwater Range.

In 2010, the USFWS designated the Sonoran pronghorn as a nonessential experimental population, as defined under Section 10(j) of the ESA within a portion of its historic range. This area is located north of I-8 and south of I-10 and encompasses all of YPG (USFWS, 2011c). Nine pronghorn were released into the Kofa NWR in the King Valley area by the USFWS in January 2013 in an attempt to establish additional Sonoran pronghorn populations within this portion of its historic range. From the 2013 release, three pronghorn died, two returned to the release pen, and one is unaccounted for (Bright, 2013). Three of the remaining pronghorns are observed regularly on the eastern portion of the Kofa Range on YPG. In January 2014, 23 additional pronghorn were released onto Kofa NWR within King Valley.

The pronghorn have been observed on YPG using a man-made pond (SWTR pond) on the eastern portion of the Kofa Range, which is located toward the southern end of King Valley. This pond is maintained to supply water for dust suppression or construction and maintenance activities on YPG. It is not fenced and is frequented by deer, horses, coyotes, and other wildlife. Camera traps detected the pronghorn using this facility multiple times in June, August, and September of 2013. No observations of pronghorn occurred in July and October 2013, but this likely is due to camera failures. Normal dispersal of the nonessential experimental population of Sonoran pronghorn will likely result in additional animals occurring on YPG. As their population increases, so will pronghorn encounters on YPG.

Normal dispersal of Sonoran pronghorn released or living on Kofa NWR has resulted in the animals occurring on YPG, at least as transients. USFWS has documented radio-collared Sonoran pronghorn moving across YPG, primarily through King Valley in the Kofa Region, to lands south of YPG. The likelihood of animals occurring on or traversing YPG will increase as the population increases. Released animals may be taken within the boundaries

of YPG when the take is incidental to, and not the purpose of, carrying out a lawful activity. Otherwise, a take of these animals is prohibited unless authorized through consultation with USFWS. YPG is required to report a take resulting from military operations to USFWS. For the purposes of ESA Section 7 consultation, since the Sonoran pronghorn released on Kofa NWR are classified as nonessential experimental when on YPG, pursuant to Section 10 (j) of the ESA, the pronghorn are treated as a species proposed for listing. This status requires conferencing with USFWS on any projects likely to jeopardize the continued existence of the entire species. YPG entered formal Section 7 consultation with USFWS regarding its activities and operations relative to this experimental population and received a BO on September 9, 2014. Because this population of pronghorn is classified as threatened within the boundaries of Kofa NWR, YPG would consult with USFWS regarding any new military activities that would extend onto the refuge.

3.16.1.2 Other Native Sensitive Species

The AZGFD classifies some native wildlife as species of special concern. The USFS and BLM also classify some native species of plants and animals as sensitive species. In addition to these native species, non-native wild horses and burros, which are protected by federal law, occur on YPG.

There are 45 sensitive species of plants and animals known to occur in Yuma and La Paz Counties that are not listed under the ESA (AZGFD, 2010c; Appendix J). Sixteen of these species occur on near the boundaries of YPG: American peregrine falcon and Sonoran desert tortoise, discussed above, and the banded Gila monster (*Heloderma suspectum cinctum*), California leaf-nosed bat (*Macrotus californicus*), cave myotis (bat) (*Myotis velifer*), desert barrel cactus (*Ferocactus cylindraceus*), desert rosy boa (*Lichanura trivirgata gracia*), loggerhead shrike (*Lanius ludovicianus*), Mohave fringe-toed lizard (*Uma scoparia*), osprey (*Pandion haliaetus*), Parish's onion (*Allium parishii*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), spotted bat (*Euderma maculatum*), straw-top cholla (*Cylindropuntia echinocarpa*), western burrowing owl (*Athene cunicularia hypugaea*) and western yellow bat (*Lasiurus xanthinus*). The 14 species not previously discussed in this document are described below.

Kofa Mountain barberry (*Berberis harrisoniana*) is known from the region, but extensive surveys for this distinctive plant indicate it does not occur on YPG.

Banded Gila Monster. The banded Gila monster is a medium-sized venomous lizard with a robust body. It has a large head, narrow neck, and two black collar bands separated by a white band. In Arizona, the banded Gila monster occurs in deserts across the northwestern and western parts of the state, north of the Gila River. Both Yuma and La Paz Counties are within the range of the species. The banded Gila monster generally occurs on hillsides and slopes, in canyons, gullies, and washes with rock substrates, and occasionally in rock piles. Fallen logs or debris are often used for burrows and the species prefers highland rocky outcrops during winters (AZGFD, 2011a). Suitable habitat for this species occurs among the various washes and along the rocky hillsides throughout YPG.

California Leaf-nosed Bat. The California leaf-nosed bat is a medium sized gray bat with large ears and a flattened, leaf-shaped nose. The species typically roosts in the ceilings of caves and mines in groups of up to several hundred (AZGFD, 2011b). The California leaf-nosed bat mostly inhabits Sonoran desert scrub habitat and feeds on insects and possibly

cactus fruits. This species is known to roost in mines and caves on YPG and is one of the most commonly observed bats on the installation (YPG, 2012b).

Cave Myotis. The cave myotis (bat) is a relatively large myotis, with color ranging from light brown to nearly black, with a bald patch between the shoulder blades. The cave myotis roosts in caves, tunnels, and mineshafts and under bridges. It typically forages in desert scrub of creosote, brittlebush, palo verde, and cacti. In Arizona, winter roosts are typically wet mine tunnels above 6,000 ft (AZGFD, 2011b). Marginal foraging habitat occurs on YPG, and the old mines on YPG could provide roosting habitat.

Desert Barrel Cactus. The desert barrel cactus typically exhibits a single stemmed, erect or slightly leaning growth form. This cactus can reach 10 ft tall, but averages around 5 ft. The flowers are maroon on the outside and yellow on the inside. The species typically occurs on gravelly or rocky hillsides, canyon walls, alluvial fans, and margins of washes in the Mohave and Sonoran Deserts derived from igneous or limestone substrates. This species occurs in Yuma County near the northwest end of the Gila Mountains and near the southern end of the Kofa Mountains. This species is classified as salvage restricted in Arizona, but is not otherwise threatened (AZGFD, 2011c).

Desert Rosy Boa. The desert rosy boa is a heavy-bodied snake averaging 24 to 45 inches in length with a pale gray to dark bluish slate-gray color. This species is mainly nocturnal and spends most of the time deep in rock crevices or underground. The species typically occurs in rocky areas in desert ranges, especially canyons with permanent or intermittent streams and basalt- or granite-derived soils. The desert rosy boa is known to occur in the Kofa NWR near the border with YPG and could occur on YPG (AZGFD, 2011a). Habitat for this species would be marginal on YPG, due to the lack of intermittent or permanent streams with riparian areas.

Loggerhead Shrike. The loggerhead shrike is slightly smaller than the American robin and grayish in color with a distinct black mask that extends above the eye and across the bill. This bird prefers open country with scattered trees and shrubs, savanna, and desert scrub. Shrikes are often seen perched on poles, wires, or fence posts (AZGFD, 2011d). The loggerhead shrike is a resident species on YPG.

Mohave Fringe-toed Lizard. The Mohave fringe-toed lizard is distinguished by a black spot on each side of the belly, crescent-shaped black throat markings, and a greenish yellow-tinged belly. This lizard prefers areas of fine, loose, windblown sand of dunes, flats, riverbanks, and washes in the Mojave Desert of California and in the extreme western part of Yuma County. The species is a BLM Sensitive species and is classified as Wildlife of Special Concern in Arizona. The Mohave fringe-toed lizard occurs in the northwest portion of the Cibola Region on YPG where an apparently stable population exists within a sand dune complex (Figure 3-6). The area where the Mohave fringe-toed lizard occurs in the Cibola Region is not within the area that would be affected by the Proposed Action. Potentially suitable habitat for this species also occurs within the Laguna Region (YPG, 2012b).

Osprey. The osprey is a large raptor that is brown above and white below, with a white head and dark line near the eye on each side. Osprey typically nest near waterbodies and in Arizona mainly occur at lakes in the White Mountains and across the Mogollon Plateau. A few occurrences are known along the Salt and Gila Rivers (YPG, 2012b). There is no suitable

foraging or roosting habitat for this species on YPG, but it is occasionally observed on YPG as an incidental. Because of its mobility, the osprey would not be affected by the Proposed Action and is not further discussed.

Parish's Onion. The Parish's onion is an herbaceous perennial that occurs on open rocky and sandy slopes in the Mojave Desert and desert mountain ranges. The species occurs within the Kofa NWR. The Parish's onion is a BLM Sensitive species and is classified as salvage restricted by the State of Arizona (AZGFD, 2011c). Salvage restricted includes species regulated by the Arizona Native Plant Law that can only be collected with a permit. This species may occur on YPG near the border with the Kofa NWR.

Pocketed Free-tailed Bat. The pocketed free-tailed bat is one of the smallest bat species, averaging 2.95 to 3.5 inches in total length. The upper fur is dull with a tawny, buffy, or brown color and paler, buffy to yellowish white underneath. The species occurs in a variety of upland and lowland habitats, which include riparian areas, desert scrub, moist woodlands, and forests. It appears to prefer cliffs and rocky walls near water. The pocketed free-tailed bat roosts in caves, mines, cliff crevices, and man-made structures. This species is known to occur in Yuma County and winters in the Lower Colorado River area (AZGFD, 2011b). This species likely occurs on YPG and could roost on the installation.

Spotted Bat. Spotted bats occur in varied habitats, but most often in riparian habitats or in dry, rough desert scrub, from low to high desert. This species occurs in Yuma County, but is known only from south of the Gila River. Spotted bats are a Federal Species of Concern, BLM Sensitive, USFS Sensitive, and a Wildlife of Special Concern in Arizona (AZGFD, 2011b). This species may forage or occur as a transient on YPG but would not roost there. It is unlikely that this species would be affected by the Proposed Action.

Straw-top Cholla. Straw-top cholla occurs in the driest parts of the Sonoran and Mojave Deserts, generally in creosote bush scrub habitats. This species has been documented as occurring on YPG. Straw-top cholla is not threatened or considered sensitive to extinction, but is listed as salvage restricted in Arizona (AZGFD, 2011c).

Western Burrowing Owl. This medium sized ground-dwelling owl occurs in open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands (AZGFD, 2011d). Western burrowing owls occur on YPG and are known from much of the surrounding area, including the Lower Colorado and Gila River valleys and the City of Yuma area (AZGFD, 2011d; YPG, 2012b).

Western Yellow Bat. Western yellow bats are medium-sized and usually pale, yellow-brown in color. Southern Arizona is considered the northern extent of its range and the species likely occurs there year-round. This species is usually found near thick vegetation while roosting and has been found in palm fronds. Western yellow bats also occur in riparian areas with thick, leafy vegetation (YPG, 2012b). Western yellow bats are BLM Sensitive, USFS Sensitive, and a Wildlife of Special Concern in Arizona (AZGFD, 2011b). A western yellow bat was tentatively identified during mist net surveys in Vinegaroon Wash (YPG, 2012b) and one western yellow bat was captured by AZGFD at Lake Alex. Suitable roosting habitat for this species is not present on YPG, but the species may forage on YPG or occur as a transient.

3.16.1.3 Wild Horses and Burros

Wild horses and burros (*Equus* spp.) are protected by the Wild Free-Roaming Horses and Burros Act of 1971, which protects free-roaming horses and burros from capture, branding, harassment, or death. In spite of the non-native status of these animals, the Wild Free-Roaming Horses and Burros Act states that these should be considered an integral part of the natural system of the public lands in areas where they occurred in 1971 (BLM, 2006). Wild horses and burros occur on YPG and are managed under the Cibola-Trigo Herd Management Area Plan, which includes all of YPG, and the public lands adjacent to the installation. Burros and wild horses could occur throughout YPG, but typically concentrate near water sources, including artificial tanks, Ivan's Well, and Lake Alex (YPG, 2012b).

3.16.2 Environmental Consequences

The following were evaluated to determine potential impacts to threatened or endangered species:

- Permanent loss of habitat due to construction of impervious surfaces
- Temporary loss of habitat due to testing and training activities in the ranges, including areas of habitat that could be restored
- Removal of water tanks that may be used by threatened or endangered species, or by species of concern.
- Disruption of the behavior of TES species due to construction or training and testing activities on YPG
- Reduction in population and survival rates of TES species due to construction or testing and training activities
- Reduction in population and survival rates of TES species, particularly the Sonoran desert tortoise, due to a concentration of predators at the edges of human activities, powerlines, and roads.
- Taking of a threatened, endangered, or candidate species due to construction or testing and training activities, including actions that would take Sonoran pronghorn within the boundaries of Kofa NWR.

3.16.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to TES species include:

- Negligible (less than significant) – Activities that would cause barely perceptible behavioral changes in TES species
- Minor to Moderate (less than significant) – Activities that would cause behavioral changes in TES species but that would not cause mortality or reduce reproduction or productivity
- Severe (significant) – Activities that would cause mortality of TES species
- Severe (significant) – Activities that would cause behavioral changes in TES species that reduce reproduction or productivity

3.16.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, conditions on YPG would not change and testing and training activities would continue to fluctuate between historical high and low levels. Ongoing testing and training would occur in specific areas within YPG (Figures 2-4 through 2-12). Tables identifying the testing and training activities that would occur under the No Action Alternative are provided in Appendix B (Tables B-1 through B-3), separated according to the three regions (Laguna, Cibola, and Kofa Regions). No test areas, munitions impact areas, or DZs would be expanded under the No Action Alternative. No construction or demolition would occur under the No Action Alternative. Continuing mission operations would not result in impacts to TES species with current species distributions, as testing and training activities continue in authorized areas at authorized levels. The evaluations and analyses presented in the NEPA documents listed in Section 2.3.2 provide an assessment of the potential impacts to TES species that would result from the No Action Alternative. The analyses presented in the NEPA documents listed above are incorporated into this FPEIS by reference.

Should TES species distributions change, impacts to TES species could result from on-road and off-road vehicle use, dismounted maneuvers, and test operations (including the set-up for test operations).

Direct impacts to Sonoran pronghorn on YPG could include injury or direct mortality as a result of firing into munitions impact areas. The same impacts could also occur outside of designated munitions impact areas as a result of overshoots and stray rounds, vehicle collisions, animals becoming tangled in communication wire or fencing, or animals being injured by running into infrastructure such as buildings, towers, trenches, or any other man-made structures.

Historically, YPG has fired long-range munitions over the Kofa NWR. The recently established long-range munitions impact areas in the Cibola Region (YPG, 2013a) allow some testing of these munitions types to be relocated from the Kofa Region to the Cibola Region and have reduced the need for firing over the Kofa NWR. However, mission requirements will continue to result in firing over the artillery buffer in Kofa NWR into munitions impact areas on YPG. YPG will coordinate appropriately with USFWS in advance of any such activities. Any impacts from these testing activities would be expected to be minor and related to startle from the noise of the rounds in flight.

There would be potential for overshoots and stray rounds fired on KFR to enter the artillery buffer area of the Kofa NWR and there would be a remote possibility for impacts to the threatened Sonoran pronghorn on the refuge. While military munitions may enhance pronghorn habitat by creating depressions that retain water and have greater vegetation growth, there is the potential for direct injury and mortality from munitions overshoots (Krausman et al., 2007).

There is potential for recreational users on the southern portion of Kofa NWR to be within YPG Airspace R-2307. Prior to conducting operations with a safety fan that extends into the Kofa NWR, YPG will verify there are no people in the portion of an SDZ extending into the Kofa NWR. Helicopters will be used to locate people where large portions of an SDZ overlap Kofa NWR, primarily in R-2307. Helicopters have higher potential to disturb pronghorn due to their rotor noise and hovering during low-altitude flight. Helicopter

safety sweeps of the refuge in R-2307 would occur mostly over mountainous terrain where habitat is less suitable for Sonoran pronghorn. Such overflights would occur only as needed and any disturbance to Sonoran pronghorn would be expected to be limited to temporary displacement, should animals be in the area of the sweep.

Current YPG military activities on Kofa NWR include over flights and safety fans for munitions testing. Depending on conditions at the time of testing and test-specific parameters, military activities, including UAS operation, occur over the refuge daily within Airspaces R-2307, R-2308A, R-2308b, and R-2308C (refer to Figure 2-3). Most military use of this airspace occurs between 8,000 and 32,000 ft AGL (Franklin, 2013b, personal communication). The IONMP identifies Kofa NWR and Imperial NWR as areas where pilots should remain at least 2,000 ft AGL, and this noise recommendation also is recognized in the LAAF Operations Manual. Studies conducted on the Barry M. Goldwater Range, where a natural population of Sonoran pronghorn occurs, for MCAS Yuma determined that the animals did not respond negatively to military aircraft over flights, exhibiting neither behavioral changes nor increased energy expenditures, relative to control populations, when subjected to military aircraft over flights (Krausman et al., 2005). Because of the altitude maintained by military aircraft when over Kofa NWR, military aircraft over flights on Kofa NWR would not be expected to have behavioral impacts to Sonoran pronghorn.

YPG would continue to implement the portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008; Appendix I) that are consistent with the military mission to develop appropriate avoidance and mitigation strategies for proposed activities that would occur in Sonoran desert tortoise habitat.

Under the No Action Alternative, YPG would continue to coordinate with AZGFD to rehabilitate injured animals, including TES species, where recovery is practicable. YPG would continue to maintain movement corridors and migratory pathways that would allow seasonal movements of the experimental population of Sonoran pronghorn, should they begin utilizing YPG. YPG would coordinate law enforcement efforts with AZGFD and USFWS to address illegal hunting and habitat degradation associated with unauthorized recreation and illegal hunting, and YPG would patrol remote areas and maintain boundary and access signs to deter illegal and unauthorized activities that could negatively affect TES species. These actions would benefit TES species.

The NRC-licensed DU impact area has a DU Catchment Structure, and spent DU rounds are regularly collected by Ammunition Recovery personnel and stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. There is an evaporative lagoon that collects runoff from the DU Catchment Structure and is sized to accommodate a 100-year storm event to minimize the potential for stormwater transport of DU off-post or to other areas on-post. Studies have shown (Obregon, 2013c, personal communication) that DU is contained within the DU licensed area and does not migrate. Because the DU is contained within the NRC-licensed DU impact area, DU would not directly affect any TES species. The greatest potential for impacts would be to small herbivores (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.16.2.3 Impacts of the Proposed Action/Preferred Alternative

This section addresses potential impacts to TES species on YPG; common wildlife species are addressed in Section 3.21. Impacts to TES species that could occur under the No Action Alternative, if species distributions change, also would occur under the Proposed Action. In addition, there would be potential for direct and indirect impacts from construction and use of new or expanded testing and training areas. Direct impacts to TES species would result from displacement or incidental mortality. Indirect impacts to TES species could result from disturbance that leads to nest/den abandonment, loss of habitat, or disruption of migratory pathways. The majority of habitat for TES species on YPG would remain intact. Additional indirect impacts to TES species could result from introduction or spread of exotic invasive plant species, which would result in habitat degradation. Disruption of normal activity patterns and loss of habitat would be the primary impacts to wildlife. Limited incidental mortality would likely occur, but would be less than significant at the population level. YPG would continue to maintain movement corridors and migratory pathways for wildlife.

Areas with water tanks (discussed in Section 3.20) that may be used by protected species would be avoided to the extent such action is consistent with the military mission. Excluding new or expanded LTAs, which would not affect wildlife water tanks, only eight proposed activities would occur in proximity to established water tanks. Current plans would not result in removal or relocation of any wildlife water tanks, but should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location. Disruption of normal animal activity patterns would likely result from removal and replacement of water tanks, but these impacts would be short-term and minor with regard to TES species. No population level impacts would be expected.

Exotic invasive plant species can become established in areas where soils are disturbed, such as construction sites and areas used for testing and training. Exotic invasive plant species displace native vegetation and offer less habitat value than native plants. Encroachment by exotic invasive plants can eliminate food resources and structural habitat used by TES species. Native TES species are not adapted to these non-native plants and may not be capable of using them for food or habitat. Exotic invasive plant species consume more water than native vegetation and can reduce available surface water or shallow groundwater. The reduction in available water can lead to water stress in TES species and ultimately to mortality and reduction of population viability. Because exotic invasive plants can affect TES species through alteration of habitat, increased potential for wildfire, and loss of available water, it is desirable to control these species on YPG. A program to establish exclusion, monitoring, and eradication of exotic invasive plants on YPG is being developed as part of the ongoing INRMP implementation (YPG, 2012b). Control of exotic invasive plant species would be beneficial to TES species and their habitat.

Wildfire could impact TES species on YPG through direct mortality, disruption of reproduction, or loss of habitat. Desert plants are not adapted to fire, and wildfire impacts to TES plant species would be greater than those to TES animal species. Exotic invasive plant species have the greatest potential to affect wildfire size and intensity through creation of extensive stands with high fuel loads (see Sections 3.7 and 3.18). Areas where native vegetation is cleared or where soils are disturbed are more susceptible to colonization by

exotic invasive plant species. Because desert vegetation recovers slowly, wildfire impacts to TES plant species and habitat for TES species are long-term. Depending on the size and intensity, impacts from a particular wildfire could range from minor to severe. Measures that would be implemented to minimize the potential for colonization and growth of exotic invasive plant species are discussed in Sections 3.7 and 3.18. Implementation of these measures would minimize the potential for severe impacts to TES species from wildfire. Control of exotic invasive plant species would reduce wildfire risk to TES species.

Noise and the physical activity associated with the presence of humans during construction and during testing and training events can cause TES animals to relocate. TES animals may abandon nests or dens in the immediate area of human activities, including abandonment of young. These types of impacts can be minimized during construction by conducting work outside of the reproductive period, but avoidance of this type would not be practicable for testing and training activities. The nearly constant level of testing and training conducted on YPG makes it unlikely that TES animals would nest or den in proximity to areas used for these purposes, unless the TES animals were already acclimatized to increased human activity. Because most construction would occur in areas where high levels of human activity already occur and because testing and training are ongoing at or near most locations where new or expanded testing and training areas are proposed, it is expected that the potential for nest/den abandonment would be minor. Where feasible, activities would be scheduled to minimize potential conflict with TES animal reproduction and rearing of young. There would be yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically.

Incidental mortality of TES species could occur during construction or during testing and training activities. The potential for incidental mortality of TES plant and animal species was minimized through site selection. Where practicable, proposed activities would be implemented in areas where TES species do not occur. No TES species would be expected to become locally extinct as a result of increased incidental mortality caused by the Proposed Action. Where practicable, TES animals or plants would be relocated from proposed activity areas in accordance with procedures established in the INRMP. Any impacts from incidental mortality associated with construction would be minor and short-term. Incidental mortality from testing and training activities would be minor and long-term.

The following sections provide a discussion of the potential for species-impacts to TES species that could occur on YPG.

Transient Species. One protected bird species, the delisted American peregrine falcon, may occur as a transient or migrant on YPG. Because these species would not be expected to roost on YPG and because they are highly mobile, these animals would be able to relocate from areas of disturbance. Impacts to these species would likely be limited to displacement. Any such impacts would be negligible to minor.

Federally Listed Species. This section addresses potential impact to the Sonoran desert tortoise and the experimental population of Sonoran pronghorn. No other species listed or candidate species for listing under the ESA have the potential to be impacted by the Proposed Action on YPG.

Sonoran Desert Tortoise. YPG would continue to implement the portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008 Appendix I) that are consistent with the military mission to develop appropriate avoidance and mitigation strategies for proposed activities that would occur in Sonoran desert tortoise habitat. Most components of the Proposed Action would be implemented in portions of YPG with low Sonoran desert tortoise populations or in areas unoccupied by Sonoran desert tortoise at present. Therefore, indirect impacts resulting from habitat alteration would be the most likely impacts to the species. There would be potential for direct mortality in areas where tortoises occur and the potential for direct impacts is discussed following the discussion of indirect impacts.

Proposed construction sites for a fire station, runway, C-130 parking area, re-fueling area, and aircraft hangar in the northern portion of the Laguna Region (L105, L107a-d) are in proximity to a desert tortoise sighting and the 1-mile buffer associated with that sighting (Figure 3-5). Although there has been a desert tortoise identified near the proposed construction activity, there are no areas classified as primary desert tortoise habitat within the boundaries of the Laguna Region. Additional environmental analysis would be required before the implementation of these long-term projects, as conditions would be subject to change in the intervening period. YPG will follow the portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008 Appendix I) that are consistent with the military mission in potential desert tortoise areas.

Habitat alteration in areas that have been identified as primary desert tortoise habitat, which could indirectly impact the Sonoran desert tortoise in the Cibola Region, would result from the construction/establishment of runways-helipads, buildings, dismounted maneuver areas, DZs, UAS launch/recovery areas, utility lines, test courses, LTAs, munitions impact areas, and TGP.s.

In the Cibola Region, up to 980 ac would be used for six proposed DZs (C002-a through C002-f), up to 1,220 ac would be used as impact areas (C003-a through C003-c, C006, C009, C011), and up to 45,260 ac would be used as LTAs for dismounted maneuvers (C060, C061, C062, and C063). No vegetation clearing would occur in the impact areas or LTAs and only minimal clearing would occur in DZs. Habitat impacts would be minor from proposed testing and training activities in DZs, which would be spread in space and time.

Up to 17 ac within areas that have been identified as primary desert tortoise habitat in the Cibola Region could be removed or cleared for proposed construction activities (buildings, graded parking areas, and access trails (C004a, C005a, C008a, C010, C033a, C046a) (Figure 3-6). Proposed activities C066a and C066-b would alter approximately 5.5 ac of land within the area classified as primary desert tortoise habitat. However, under the Preferred Alternative, the cable drop site in the Kofa Region (K024), which is not within an area identified as primary desert tortoise habitat, would be implemented rather than C066. Incidental mortality of Sonoran desert tortoise could occur during clearing of vegetation and during testing and training activities. Any such losses would likely be very rare as a result of implementation of appropriate mitigation measures consistent with the portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008 Appendix I) that are consistent with the military mission. Impacts to areas classified as primary tortoise habitat resulting from

vegetation clearing and construction activities in the Cibola Region would be long-term and moderate.

Infrastructure improvement activities (C004-b, C005-b, C007-b, C012-b, C013, C033-b, and C040-b) are proposed within areas identified as primary desert tortoise habitat in the northern Cibola Region (Figure 3-6). Construction-related soil and vegetation disturbance along utility lines on up to 8.2 ac could occur. Impacts to tortoise habitat from infrastructure improvements would be temporary and minor because improvements would be spread out through time and the habitat would be expected to gradually recover following infrastructure improvements.

In the Cibola Region, there are five activities under the Proposed Action that would occur in proximity to the documented Sonoran desert tortoise sighting or the 1-mile buffer associated with the sighting (Figure 3-6). The activities include a DZ (C002-b), building construction (C005-a), an LRA impact area (C065), and two proposed LTAs (C060, C062). Additionally, portions of a proposed LTA (C001) in the southern part of the Cibola Region are within the 1-mile buffer area of the documented Sonoran desert tortoise sighting (Figure 3-6). However, this LTA would not be in the area classified as primary desert tortoise habitat, and impacts to desert tortoise from dismantled maneuvers would be minor.

Alteration of habitat in the area designated as primary Sonoran desert tortoise habitat could result from activities in the East Arm of the Kofa Region and any habitat alteration could indirectly impact the Sonoran desert tortoise. Habitat alteration would result from establishment and operation of a DZ (K001), the East Kofa Ops Center (K030), a testing/training complex in the northern portion of the East Arm (K030), and training activities at the East Arm LTA (K021) (Figure 3-7). Under the Proposed Action, approximately 36.1 ac of desert scrub habitat in the Kofa Region would be removed or cleared for the training complexes, approximately 194 ac would be converted to a DZ, and approximately 28,233 ac could be converted to an LTA. No vegetation clearing would occur in the proposed DZs or the proposed dismantled maneuver area. These proposed activities could impact land classified as primary Sonoran desert tortoise habitat, but the large amount of acreage associated with K021 (an LTA) would not experience substantial disturbance as activities would be limited to dismantled maneuvers. Impacts to areas identified as primary tortoise habitat resulting from vegetation clearing and construction activities in the Kofa Region would be long-term and moderate. YPG will follow the portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008 Appendix I) consistent with the military mission in potential desert tortoise areas.

Because Sonoran desert tortoise exhibit high site fidelity, it is unlikely the species would avoid areas of high human activity. In areas of high quality habitat for the Sonoran desert tortoise, surveys would be conducted to determine whether the species occurs and animals would be relocated to other suitable habitat to minimize impacts. If active nests are found in an area that would be disturbed, activities would be delayed until after the eggs have hatched and the young could be relocated into other suitable habitat. Any relocation of Sonoran desert tortoise would be done following procedures in the INRMP and in coordination with USFWS.

Should the Sonoran desert tortoise be listed as threatened or endangered under the ESA, either additional coordination or ESA Section 7 consultation with USFWS would be

required prior to any land-disturbing activities in areas where Sonoran desert tortoise are known to occur on YPG. Depending on the activity, either a Biological Assessment or Biological Evaluation would be prepared to support consultation.

If adjacent habitats are likely to support the Sonoran desert tortoise, simple barriers, such as exclusion fencing, may be erected around construction areas to deter entry into the area. If denied access to the proposed work area, it is expected that the tortoise would shift activity to other nearby suitable habitat.

Incidental mortality of Sonoran desert tortoise could occur during clearing of vegetation and during testing and training activities. Any such losses would likely be very rare as a result of relocation and exclusion measures that will be implemented in areas where the species is likely to occur and because most components of the Proposed Action would be implemented in areas where Sonoran desert tortoise are not known to occur. No local populations would likely be extirpated due to the Proposed Action (YPG DPW, 2010b). Impacts would be long-term and moderate.

No TGP's are proposed for areas where the Sonoran desert tortoise is known to occur. Each proposed TGP site would be assessed prior to implementation for presence of Sonoran desert tortoise or their nests. Should use of a proposed TGP site by Sonoran desert tortoise be documented, YPG could choose to relocate a proposed TGP, if practicable, to avoid potential impacts to this species or measures would be taken to relocate tortoises from an area prior to establishment of the TGP. If active nests are found in an area, activities could be delayed until after the eggs have hatched and the young could be relocated as discussed above or the nest could be sheltered in place using the appropriate protocols through coordination with AZGFD, with the young relocated if hatching occurs prior to the end of the work. Impacts would be minor and long-term.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a solar electrical energy generation facility would not result in loss of land designated as primary desert tortoise habitat, depending on the site selected. This could incrementally combine with other projects in the region to produce cumulative impacts to Sonoran desert tortoise.

Should the Sonoran desert tortoise be listed under the ESA, YPG would re-evaluate any projects proposed for implementation in portions of the installation where the Sonoran desert tortoise might occur and would consult with USFWS, as necessary prior to any ground-disturbing activities.

Sonoran Pronghorn. Three of the pronghorn released on Kofa NWR have been regularly observed by camera traps using a man-made pond in the eastern part of the Kofa Region near the southern end of King Valley (Steward, 2013, personal communication). This pond is maintained for dust suppression and for construction and maintenance activities on YPG. The pond is not fenced and is frequented by deer, horses, coyotes, and other wildlife. The animals have not been observed west of US 95 in the Cibola Region (USFWS, 2013). It is

likely that, as the released Sonoran pronghorn population grows, the occurrence of these animals on YPG will increase.

The experimental population of Sonoran pronghorn would likely continue to periodically move onto YPG concurrent with activities implemented under the Proposed Action. Testing and training activities would be ongoing and the experimental population of Sonoran pronghorn could be impacted directly or indirectly by human presence on the range, vehicle traffic, noise from munitions firing and impact, and aircraft noise (YPG DPW, 2014).

Explosions from munitions testing and training on YPG in the Castle Dome Mountains along the western boundary of Kofa NWR would be audible for several miles onto the Kofa NWR, including in areas where Sonoran pronghorn may occur. However, it is unlikely that this noise would be heard in the vicinity of the captive breeding pens (USFWS, 2009c).

Response to explosive noise could alter habitat utilization by causing pronghorn to move away from food or water sources, and behavioral impacts could impact nutrition and health of the animals, particularly in times of drought. However, because munitions testing and training occur throughout the year in this area, the noise from these events would likely be perceived as part of the background noise and would not affect pronghorn unless the animals were in immediate proximity to a detonation.

Wildfire, either naturally occurring or resulting from human activities, could result in loss or alteration of Sonoran pronghorn habitat. A portion of wildfires that result from human activities may be ignited as a result of testing and training activities on YPG. Wildfires that ignite from activities on YPG could create short-term indirect impacts to Sonoran pronghorn from loss of foraging habitat or loss of vegetative cover that leads to increased predation. Wildfire also may result in long-term indirect beneficial impacts to Sonoran pronghorn because forage quality may be enhanced by increased growth of plants following fire. A reduction in density of large perennial plants (such as shrubs and large cacti) following wildfire may be favorable by pronghorn; however, the reduction in cover may result in increased fawn mortality from predation.

Direct impacts to Pronghorn on YPG could result from vehicle strikes, tangling in communication wire or fencing, or injury by running into infrastructure such as buildings, towers, or trenches. Detonations from military munitions may create depressions that retain water and have greater vegetation growth, which can improve forage quality or quantity for Sonoran pronghorn. However, there also is potential for direct injury or mortality from detonations. The potential for such injury on YPG is very low due to the low numbers of Sonoran pronghorn that cross YPG and the low likelihood of an animal actually being at a detonation point at the time of the explosion. Munitions overshoots or errant rounds have a very low probability of landing on the Kofa NWR and most historical rounds that strayed onto the refuge landed in a mountainous area where Sonoran pronghorn would be unlikely to occur. The potential for direct impacts to Sonoran pronghorn on the Kofa NWR as a result of errant rounds or overshoots would be negligible.

Current YPG military activities on Kofa NWR include over flights and safety fans for munitions testing. Depending on conditions at the time of testing and test-specific parameters, military activities, including UAS operation, occur over the refuge daily within Restricted Airspaces R-2307, R-2308A, R-2308b, and R-2308C (refer to Figure 2-3). Most military use of this airspace occurs between 8,000 and 32,000 ft AGL (Franklin, 2013b, personal communication). The IONMP identifies Kofa NWR and Imperial NWR as areas

where pilots should remain at least 2,000 ft AGL, and this noise recommendation also is recognized in the LAAF Operations Manual. Studies conducted on the Barry M. Goldwater Range, where a natural population of Sonoran pronghorn occurs, for MCAS Yuma determined that the animals did not respond negatively to military aircraft over flights, exhibiting neither behavioral changes nor increased energy expenditures, relative to control populations, when subjected to military aircraft over flights (Krausman et al., 2005). Because of the altitude maintained by military aircraft when over Kofa NWR, military aircraft over flights on Kofa NWR would not be expected to cause behavioral impacts on Sonoran pronghorn. No low level flights over Kofa NWR would occur under the Proposed Action.

Implementation of proposed new UAS launch/recovery areas in the Cibola Region would reduce the number of UAS flights over the southern portion of the Kofa NWR because there would be more options for conducting testing activities and tests would be spread over more of YPG.

Proposed Activities K003 and K030 would occur in the portion of the Kofa Region where Sonoran pronghorn have been documented (Figure 3-8). After considering concerns raised by USFWS, YPG has selected a reduced version of these activities under the Preferred Alternative, reducing the size of the proposed munitions impact area and LTA. The boundaries would stop 1 kilometer (0.62 mile) south of the installation boundary at the Kofa NWR on the north and 500 m (0.31 mile) east of the installation boundary with the Kofa NWR on the west (Figure 2-18).

YPG initiated consultation with USFWS under Section 7 of the ESA regarding activities with potential to impact Sonoran pronghorn on the Kofa NWR on March 25, 2014 (YPG, 2014a; YPG, 2014b; Appendix A). Consultation was concluded with issuance of a BO by the USFWS on September 9, 2014. The BO included three Reasonable and Prudent Measures with implementing Terms and Conditions that YPG will comply with:

1. To comply with Reasonable and Prudent Measure Number 1: YPG shall monitor environmental conditions on the Kofa Range, including weather patterns (e.g., temperature, precipitation, humidity) and status of fuels (e.g., distribution and density of annual vegetation or any other vegetation that is capable of carrying fire across the landscape).
2. To comply with Reasonable and Prudent Measure Number 2: YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire department with wildland firefighting capabilities. Additionally, YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire station on the KFR to provide rapid response on the Kofa Range in the event of fire. If the fire department and/or fire station are discontinued at any time in the future, YPG shall notify USFWS-AESO and Kofa NWR, and this Term and Condition may need to be re-evaluated.

Should YPG detect exceptional fuel conditions that are conducive to carrying fire, then YPG shall increase fire readiness by (1) providing additional fire briefings to test officers to stress the importance of initial fire spotting and early notification, and (2) subject to availability of funds, maintaining fire break infrastructure where such infrastructure is compatible with the military mission (as determined by the Senior Commander) and pronghorn conservation (as determined through coordination with Kofa NWR and

USFWS-AESO) and is anticipated to reduce the risk of fire spreading to Kofa NWR (as determined by local firefighting agencies).

3. YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to USFWS-AESO and Kofa NWR as soon as possible. The report (can be in the form of an email) will, at a minimum, include the date(s), acreage, and location(s) of the fire(s), as well as the number of pronghorn in the vicinity of the fire, if known. YPG shall also immediately notify Kofa NWR once aware that a fire has encroached or may encroach onto the refuge.

Conservation measures that are included in the Proposed Action that would be implemented by YPG include:

1. Implement the 2014 Final Incident Response Protocol for Sonoran Pronghorn, which includes: (a) notifying USFWS and other appropriate parties as outlined in the protocol as soon as possible if Sonoran pronghorn are observed on YPG that are injured, sick, or dead; and (b) coordinating range access for USFWS and AZGFD as appropriate for capture of sick or injured pronghorn as well as recovery of dead individuals if necessary. Coordination will involve adherence to range safety and security procedures.
2. Avoid placing activities in proximity to artificial water sources (suitable for Sonoran pronghorn) to the extent that such action is consistent with the military mission.
3. YPG will adhere to the terms of the MOU between the Kofa NWR, Imperial NWR, BLM, and YPG, which provides procedures and guidance for cooperation and collaboration on wildland fire issues. This includes notifying interagency dispatch of any wildfire on YPG lands.

Should the status of Sonoran pronghorn released in the Kofa NWR be reclassified under the ESA with regard to activities on YPG, YPG would re-evaluate any projects proposed for implementation in portions of the installation where the Sonoran pronghorn might occur and would consult appropriately with USFWS prior to any activities that could impact the species.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Sites under consideration for the development of the proposed solar facility are not within areas used by Sonoran pronghorn. However, the habitat loss and displacement of animals from the up to approximately 8,900-ac area could incrementally negatively affect Sonoran pronghorn through increased competition for resources in areas used by pronghorn. This could contribute to minor cumulative impacts to the species.

Other Native Species of Concern. This section discusses the potential for impacts to other species of concern that are not listed or candidate species for listing under the ESA. These species include USFS and BLM Sensitive species with potential to occur on YPG.

Banded Gila Monster. It is unlikely that construction in cantonment areas would have potential to impact the banded Gila monster, as the species would not be expected to occur in these areas. Down-range construction and vegetation clearing could negatively impact

this species through loss of habitat. Because this species is slow-moving, and would tend to hide from rather than flee human disturbance, direct impacts also could result from earth-moving activities. In areas of high quality habitat for the banded Gila monster, surveys would be conducted to determine whether the species occurs and animals would be relocated to other suitable habitat to minimize impacts. If adjacent habitats are likely to support the banded Gila monster, simple barriers, such as silt fencing, may be erected around construction areas to deter entry into the area. Impacts would be minor and long-term.

It is possible that TGP's could be placed in areas where the banded Gila monster would occur. Each proposed TGP site would be assessed prior to implementation for presence of banded Gila monster or their nests. Should use of a proposed TGP site by banded Gila monster be documented, YPG could choose to relocate a proposed TGP, if practicable, to avoid potential impacts to this species or measures would be taken to relocate the lizards from an area prior to establishment of the TGP. Impacts would be minor and long-term.

Bat Species of Concern. The California leaf-nosed bat and cave myotis both forage and roost on YPG and it is likely that the pocketed free-tailed bat also forages and roosts on YPG. Caves and mines that provide roosting habitat for these bats would not be impacted by the Proposed Action. As a result, there would be no impacts to roosting habitat. Potential foraging habitat would be reduced through clearing associated with construction and establishment of TGP and UAS launch/recovery areas and land disturbance associated with DZs. Because these species forage primarily at night, no direct impacts would be expected from clearing activities. Night testing and training activities could cause direct impacts, but such occurrences would be rare. Impacts to these species would be negligible to minor and long-term.

The western yellow bat and the spotted bat may occur as transients or migrants on YPG. Because these species would not be expected to roost on YPG and because they are highly mobile, these animals would be able to relocate from areas of disturbance. Impacts to these species would likely be limited to displacement. Any such impacts would be negligible to minor.

Loggerhead Shrike. Potential foraging and nesting habitat for the loggerhead shrike would be reduced through clearing associated with construction activities, establishment of TGP and UAS launch/recovery areas, and land disturbance associated with DZs. Due to the mobility of the species, incidental mortality would be unlikely if nests are avoided. Shrikes would likely relocate away from disturbance-causing activities unless already nesting in an area. In areas of high quality nesting habitat for the loggerhead shrike, surveys would be conducted to determine whether the species is nesting. If an activity could not be relocated from the nesting area, it would be delayed until after young have fledged to avoid impacts to the species. Impacts would be long-term and moderate.

Western Burrowing Owl. Construction and expansion of testing and training could impact the western burrowing owl through loss of habitat. The grasslands around the lower Colorado and Gila Rivers provide large amounts of preferred habitat for this species and it is likely that the western burrowing owl would relocate away from areas of human use unless already nesting in an area. In areas of high quality nesting habitat for the western burrowing owl, surveys would be conducted to determine whether the species is nesting. If an activity could not be relocated from a nesting area, it would be delayed until after young have

fledged to avoid impacts to the species. The Proposed Action would have a minor to moderate long-term negative impact on western burrowing owls.

It is possible that TGPs could be placed in areas where the western burrowing owl would occur. Each proposed TGP site would be assessed prior to implementation for presence of western burrowing owl or their nests. Should use of a proposed TGP site by western burrowing owl be documented, YPG could choose to relocate a proposed TGP, if practicable, to avoid potential impacts to this species or measures would be taken to relocate western burrowing owls from an area prior to establishment of the TGP. If a TGP could not be relocated from a nesting area, it would be delayed until after young have fledged to avoid impacts. Establishment of new TGPs would have a minor long-term negative impact on western burrowing owls.

Desert Rosy Boa. The areas on YPG where the Proposed Action would be implemented do not contain potentially suitable habitat for the desert rosy boa. No impacts to this species would be expected.

No TGPs are proposed for areas where the desert rosy boa could occur. Each proposed TGP site would be assessed prior to implementation for presence of desert rosy boa or their nests. Should use of a proposed TGP site by desert rosy boa be documented, YPG could choose to relocate a proposed TGP, if practicable, to avoid potential impacts to this species or relocate the desert rosy boa from an area proposed as a TGP.

Mohave Fringe-toed Lizard. The Mohave fringe-toed lizard is known to occur on YPG only in a sand dune area in the northern Cibola Region. This area would not be impacted by any activities under the Proposed Action, including placement of TGPs. While potentially suitable habitat for the species does occur in parts of the Laguna Region, the species has not been found in the Laguna Region. The Proposed Action would not affect the Mohave fringe-toed lizard or its habitat.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Depending on the site selected, development of a solar electrical generation facility could contribute to cumulative impacts to this species.

Parish's Onion. Parish's onion occurs in the Kofa NWR near the boundary of YPG and could occur on YPG in areas near the refuge. No impacts from activities under the Proposed Action are likely to occur near the boundary with the Kofa NWR. Expansion of munitions impact areas to or near the boundary with the Kofa NWR would not likely result in munitions being fired into these peripheral areas. Any impacts would likely be from overshoots or errant rounds, which would be very infrequent. While incidental mortality could occur, such events would be rare and would not be expected to have population-level effects. Any impacts would be negligible to minor, but individual impacts would be long-term due to the slow growth rate of these species.

Other Plant Species of Concern. The desert barrel cactus, and straw-top cholla, saguaro cactus, and ocotillo occur scattered throughout YPG and these species would likely be impacted by vegetation clearing associated with creation of TGPs and UAS launch/recovery

areas and land disturbance associated with DZs. These other plant species of concern also could be impacted by other construction activities. Plants would be salvaged where practicable and relocated to other suitable habitat on YPG. There would be minor long-term impacts to these species as a result of the Proposed Action.

It is possible that TGP sites could be placed in areas where these plant species occur. Each proposed TGP site would be assessed for the presence of sensitive plant species prior to implementation. Should sensitive plant species be documented at a proposed TGP site, YPG could choose to relocate a proposed TGP, if practicable, to avoid potential impacts or YPG could salvage plants that would be affected and relocate them to other suitable habitat to minimize impacts.

Wild Horses and Burros. Past and ongoing testing and training on YPG do not appear to have negatively impacted wild horse and burro populations. These animals are very mobile and able to relocate from areas where disturbance occurs. These animals would be expected to leave areas where construction is occurring and resume use of any suitable habitat in proximity to construction sites once construction is complete. Any impacts from construction would be temporary and minor. These species use habitat throughout YPG and it is unlikely that use of new or expanded testing and training areas would have no more than minor impacts to wild horses and burros. Testing and training impacts would be long-term.

No TGP sites are proposed at locations where wild horses or burros are known to congregate. It is possible that wild horses and burros could be transient visitors at proposed TGP sites. Vegetation clearing to establish a TGP would not be done if wild horses or burros were present. Work would be delayed until the animals had left the area. Any impacts would be minor and temporary.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a solar renewable energy facility would result in the loss of up to approximately 8,900 ac of desert scrub habitat that may be used by wild horses and burros. This habitat loss, when combined with other incremental habitat loss from activities implemented under the Proposed Action, could result in indirect cumulative impacts to wild horses and burros.

Proposed Action Impacts Summary. TES animal species would be temporarily disturbed by construction activities and associated noise. It is likely that mobile TES species would relocate to similar habitat nearby. After construction is complete, TES animal species could resume use of areas adjacent to the construction or acclimatize to the new habitat occupied at the time of displacement. Most proposed construction would occur in cantonment areas or other previously developed locations where potential TES animal species habitat is limited and human activity is common. Impacts from construction of the Proposed Action would likely be minor and short-term.

Wildfire could impact TES species on YPG through direct mortality, disruption of reproduction, or loss of habitat. Wildfire would likely have a greater impact on TES plant species than on animal species. Exotic invasive plant species can affect wildfire size and

intensity in areas where native vegetation is cleared or where soils are disturbed during activities. Depending on size and intensity, impacts from a particular wildfire could range from minor to severe. Measures that would be implemented to minimize the potential for colonization and growth of exotic invasive plant species are discussed in Sections 3.7 and 3.18.

New TGP could result in disturbance, including clearing, of up to 50.6 ac of desert scrub habitat in the Cibola Region, but only within isolated areas of up to 2.2 ac each. Clearing would be spread through both space and time, but the slow recovery of desert vegetation would result in vegetation and habitat impacts being long-term. Each proposed TGP site would be assessed for the presence of TES species prior to implementation. Should TES species be documented at a proposed TGP site, YPG could choose to relocate a proposed TGP, if practicable, to avoid potential impacts or YPG could choose to relocate TES species from the area of disturbance. TES plant species would be salvaged and relocated to other suitable habitat to minimize impacts. TES animal species that are not very mobile could be relocated from these areas. If nests or dens are present in a proposed TGP area and the TGP could not be relocated, it would be delayed until after young have fledged/departed to avoid impacts.

Current plans would not result in removal or relocation of water tanks, but should changes occur that would result in water tank removal to implement an activity, any water tanks that would be removed would be replaced by a comparable water tank as close as feasible to the original location.

No low level military aircraft over flights over Kofa NWR are proposed, and the number of UAS flights over Kofa NWR would likely be reduced with implementation of new UAS launch/recovery sites in the Cibola Region.

The cumulative effect of incremental vegetation and habitat loss within YPG from all proposed activities would be moderate. No significant incremental impacts to TES species from vegetation clearing or habitat loss would be expected. Past and reasonably foreseeable future activities also could interact with the effects of the Proposed Action concerning impacts to TES species. Because all impacts to TES species resulting from the Proposed Action would be confined within the boundary of YPG and because there would be no loss of species, it is not expected that TES species impacts of the Proposed Action would interact with off-post actions to affect regional TES species populations.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. Should the project be constructed approximately 51.5 ac of moderately suitable habitat for the Mojave fringe-toed lizard would be lost, but no other impacts to TES species or their habitats would result. There could be minor contributions to cumulative impacts on TES species and their habitats.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to TES species and their habitats through land clearing and site preparation activities associated with construction. The magnitude of disturbance, the occurrence of particular TES species, and the occurrence of potentially suitable habitats for TES species within and near the proposed projects is not known at this time and the potential for cumulative impacts cannot be assessed accurately. However, it is likely that

BLM will require appropriate coordination or consultation with USFWS and AZGFD with regard to the potential to impact TES species. Through this process and subsequent implementation of any conservation measures identified by the regulatory agencies, it is expected that any contribution to cumulative impacts to TES species and their habitats would be minimal.

At present, white-nose syndrome is not known to affect bat populations in the Yuma area (USFWS, 2011d). Should this disease spread to the Southwest, there would be potential for cumulative impacts to cave-dwelling or cave-hibernating bats in the region. Because of the uncertainty associated with the potential spread of this disease, the potential for cumulative impacts associated with white-nose syndrome cannot be evaluated at this time.

3.16.2.4 Mitigation

YPG considered potential impacts to TES species in selecting locations for proposed activities. By avoiding known TES species locations, YPG minimized the potential for impacts to TES species. When implementing construction projects in areas where TES animal species are likely to nest or den, YPG would schedule construction to occur outside the nesting or denning period where practicable.

To minimize the potential for impacts from activities proposed within or adjacent to high quality TES species habitat, surveys would be conducted. If TES species are found in the proposed construction/testing/training area, YPG would first determine whether the proposed activity could be relocated. If relocation of the activity is not practicable, YPG would relocate TES species to nearby suitable habitat if practicable.

If proposed work or activities could not be done outside the nesting/denning periods for TES species, work could be delayed until after young had fledged or departed the area when practicable, or the nest could be sheltered in place using the appropriate protocols through coordination with AZGFD.

YPG would continue to implement the portions of the *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Arizona Interagency Desert Tortoise Team, 2008 Appendix I) consistent with the military mission to develop appropriate avoidance and mitigation strategies for proposed activities that would occur in Sonoran desert tortoise habitat. Where earth moving or vegetation clearing would occur adjacent to suitable habitat for the banded Gila monster or Sonoran desert tortoise, simple barriers, such as silt fencing, would be placed to deter entry by these species.

To minimize the potential for impacts to TES species, YPG would limit surface-disturbing activities to the smallest area practicable and would avoid vegetation where feasible.

The USFWS issued a BO regarding activities that may affect the Sonoran pronghorn on Kofa NWR that included three Reasonable and Prudent Measures with implementing Terms and Conditions that YPG will comply with:

1. To comply with Reasonable and Prudent Measure Number 1: YPG shall monitor environmental conditions on the Kofa Range, including weather patterns (e.g., temperature, precipitation, humidity) and status of fuels (e.g., distribution and density of annual vegetation or any other vegetation that is capable of carrying fire across the landscape).

2. To comply with Reasonable and Prudent Measure Number 2a and 2b: YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire department with wildland firefighting capabilities. Additionally, YPG shall, subject to availability of funds and where compatible with the military mission (as determined by the Senior Commander), continue to maintain a fire station on the KFR to provide rapid response on the Kofa Range in the event of fire. If the fire department and/or fire station are discontinued at any time in the future, YPG shall notify USFWS-AESO and Kofa NWR, and this Term and Condition may need to be re-evaluated.

Should YPG detect exceptional fuel conditions that are conducive to carrying fire, then YPG shall increase fire readiness by (1) providing additional fire briefings to test officers to stress the importance of initial fire spotting and early notification, and (2) subject to availability of funds, maintaining fire break infrastructure where such infrastructure is compatible with the military mission (as determined by the Senior Commander) and pronghorn conservation (as determined through coordination with Kofa NWR and USFWS-AESO) and is anticipated to reduce the risk of fire spreading to Kofa NWR (as determined by local firefighting agencies).

3. YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to USFWS-AESO and Kofa NWR as soon as possible. The report (can be in the form of an email) will, at a minimum, include the date(s), acreage, and location(s) of the fire(s), as well as the number of pronghorn in the vicinity of the fire, if known. YPG shall also immediately notify Kofa NWR once aware that a fire has encroached or may encroach onto the refuge.

Conservation measures that are included in the Proposed Action that would be implemented by YPG include:

- Implement the 2014 Final Incident Response Protocol for Sonoran Pronghorn, which includes: (a) notifying USFWS and other appropriate parties as outlined in the protocol as soon as possible if Sonoran pronghorn are observed on YPG that are injured, sick or dead; and (b) coordinating range access for USFWS and AZGFD as appropriate for capture of sick or injured pronghorn as well as recovery of dead individuals if necessary. Coordination will involve adherence to range safety and security procedures.
- Avoid placing activities in proximity to artificial water sources (suitable for Sonoran pronghorn) to the extent that such action is consistent with the military mission.
- YPG will adhere to the terms of the MOU between the Kofa NWR, Imperial NWR, BLM, and YPG which provides procedures and guidance for cooperation and collaboration on wildland fire issues. This includes notifying interagency dispatch of any wildfire on YPG lands.

Areas with wildlife water tanks (discussed in Section 3.20) that may be used by protected species would be avoided to the extent such action is consistent with the military mission. Excluding new or expanded LTAs, which would not affect wildlife water tanks, only eight proposed activities would occur in areas where wildlife water tanks are located. Any wildlife water tanks that would be removed to implement an activity would be replaced by a comparable new water tank prior to removal to maintain the resource in the area. If

removal of a water tank used by wildlife is necessary, a new water tank would be established as close as feasible to the removed water tank.

The INRMP (YPG, 2012b) directs the management of natural resources, including TES species, within YPG. Through continued implementation of the INRMP, YPG uses the best available scientific knowledge and techniques to manage its resources. YPG would update its INRMP, as appropriate, and continue to implement the INRMP, which would benefit TES species.

Management of exotic invasive plants on YPG (see Section 3.18) would benefit wildlife through improved habitat conditions. Measures that would be implemented to avoid or minimize impacts to soils (see Section 3.15), vegetation (see Section 3.18), and water resources (see Section 3.20) would provide indirect benefits to wildlife through improved habitat conditions.

Should the Sonoran desert tortoise be listed under the ESA, consultation with USFWS regarding potential impacts to this species may result in additional mitigation measures that would be implemented to meet requirements established through the ESA Section 7 consultation process. Any such mitigation measures are unknowable at this time, but YPG would comply with requirements established through the ESA consultation process.

YPG will consult with USFWS under Section 7 of the ESA regarding activities with potential to impact Sonoran pronghorn on the Kofa NWR. Should the status of Sonoran pronghorn released in the Kofa NWR be reclassified under the ESA with regard to activities on YPG, YPG would re-evaluate any projects proposed for implementation in portions of the installation where the Sonoran pronghorn might occur and would consult appropriately with USFWS prior to any activities that could impact the species.

3.17 Traffic/Transportation

3.17.1 Existing Conditions

YPG contains approximately 180 miles of paved roads, 820 miles of improved roads (gravel/graded), and numerous unimproved roads (dirt only). There are six airfields and the installation has approximately 2,000 square miles of designated restricted airspace. Installation airspace management is discussed in Section 3.3. This section discusses the YPG transportation system, including a description of routes to the installation, the internal road system, air services, rail transport, and transportation of ordnance.

3.17.1.1 External Transportation Network

YPG is located near the Arizona-California border, 25 miles north of Yuma. It is approximately 180 miles east of San Diego and approximately 185 miles southwest of Phoenix. U.S. Interstate 10 (I-10), which extends between Los Angeles and Phoenix, is just north of the northern boundary of the Cibola Region. I-8, another east/west travel route south of YPG, passes through Yuma and connects San Diego with Tucson.

US 95 is a two-lane paved road designated as a rural principal arterial (YMPO, 2010). US 95 is the principal access route to YPG and runs generally north/south between I-8 and I-10, and US 95 bisects the Laguna Region of YPG and generally lies between the Cibola Region and the Kofa NWR.

Another paved road, County Highway S24/Imperial Dam Road, provides access to the installation from the California Imperial Valley area.

General traffic volume in the region typically is greater during the winter months, coinciding with the influx of a high seasonal visitor population. The Yuma County population typically increases by 80,000 to 100,000 residents during the winter. Traffic volume decreased by about 1 percent during the 2007-2008 time period (YMPO, 2010).

3.17.1.2 Installation Road System

Facilities on YPG are linked by an internal network of maintained paved and gravel roads. Numerous unimproved roads and trails occur throughout more remote areas of the installation. YPG maintains approximately 180 miles of paved roads, 820 miles of improved roads (gravel/graded), and numerous unimproved roads (dirt only). Road access within YPG is limited because of security constraints and potentially hazardous conditions resulting from the test mission. Personnel access is controlled using security registration, checkpoints, Range Control monitoring, guard posting, signs, and fences. Public access restriction signs are placed along public thoroughfares (YPG, 2012b).

The majority of paved roads are in the Laguna Region, serving the MAA, the Yuma Test Area, and LAAF. Roads in the Cibola and Kofa Regions are mostly gravel or unimproved. In 1984, the gravel road system was upgraded with a 6-inch subsurface layer of compacted clay/gravel. The main roadways and well-traveled secondary roads are maintained by private contractors, and maintenance includes grading, watering, and repair from storm damage (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The description of the road system that follows is organized by geographic region.

Kofa Region. Aberdeen Road, Third Avenue, and Firing Front Road are the primary roads in the Kofa cantonment. All other roads in the Kofa Region are considered secondary. The ACP is on Aberdeen Road, which serves the main cantonment and continues to Firing Front Road. Third Avenue and Firing Front Road provide access to most facilities within the developed part of the Kofa Region.

There are six major gravel roads and two major paved roads within the Kofa Firing Range. All are closed to public access due to the nature of the test area. Gravel roads in this region include Growl, Kofa-Mohawk, Kofa-Wellton, Mortar Range, and Firing Front/Extension Roads. Pole Line Road is paved for approximately 20 miles extending from the Kofa cantonment and is gravel surfaced beyond that. The gravel portion of Pole Line Road is Growl Road and is maintained as necessary, generally following heavy storms that damage the surface. Secondary roads are routinely maintained (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

East Arm is mostly undeveloped and lacks an extensive road system. Some roads near the eastern portion of KFR provide access to munitions impact areas and other installation sites. East Arm is closed to public access.

YPG maintains a designated area, referred to as Safe Haven, for after-hours deliveries of sensitive cargo. Semi-trailers that arrive on YPG outside of normal business hours park at Safe Haven until they can enter YPG and make their delivery.

Cibola Region. The north and south Cibola Ranges consist of large plains surrounded by mountains and are used predominantly for aircraft armament firing and UAS testing. An

extensive network of gravel and unimproved roads allows personnel to reach testing and sensor locations. These roads also are used for range maintenance and to retrieve cargo from DZs. The main roads, all of which are gravel and maintained as required, consist of Middle Mountain, West Cibola Access, Water Tank, Cibola Front, Cheyenne Base, CM 1, Redhill, East Target, West Target, Rocket Alley, MTI (Moving Target Indicator), Target Boundary, Hogan's Highway, Rick Douglas Trail, and Bob Davis Highway. Several other small connecting roads also are maintained according to their use. Cibola Lake Road and Corral Road cross the north Cibola Region in a generally east-west direction. Cibola Lake Road is open to public access, but surrounding land is closed. The remainder of the Cibola Region road system is closed to public access (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

Laguna Region. The Laguna Region includes the MAA, the Yuma Test Area, LAAF, CDH, and the Air Cargo Complex. The eastern edge of the Laguna Region is Firing Front Road, which also defines the western boundary of the Kofa Region. Imperial Dam Road, which transects the Laguna Region, is a public road and provides the primary access to the MAA. Martinez Lake Road is a public road maintained by Yuma County that crosses YPG between Cibola and Laguna Regions (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

After entering the Main Gate ACP at the Laguna Region from Imperial Dam Road, Third Street provides access to most Garrison offices. B Street and Halo Street are the primary access roads to the residential areas, and F Street runs through the center of the support function facilities (such as the Commissary and Gymnasium). First Street, Second Street, and Zavala Avenue provide additional connections to F Street and the support function facilities. Barranca Road connects the MAA with YTC and LAAF and is access-controlled with a card reader gate.

Most of the vehicle mobility courses are in the Laguna Region. Mobility courses are not maintained as part of the transportation system, but are maintained as test areas. Unpaved roads in the Laguna Region are used to transport vehicles to mobility courses for testing (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.17.1.3 Air Transportation

The Yuma International Airport is approximately 26 miles south of YPG and offers air service via commercial carriers. This airport, which shares facilities with MCAS Yuma, is capable of accommodating most commercial and military aircraft. Air access into YPG is restricted to military and government use. Airspace over YPG and surrounding areas is restricted, as discussed in Section 3.3.1.

Within the installation, YPG operates LAAF and the CDH in support of military flight operations and aircraft test projects. LAAF has two 6,000-ft runways (150-ft wide N-S runway and adjacent 100-ft wide E-W runway) serving rotary-wing and fixed-wing aircraft, including C-130, C-5, and C-17 cargo aircraft. LAAF provides 24-hour mission support on an as-needed basis. During peak summer temperatures, aircraft are restricted to 40 percent of their gross maximum weight. LAAF also would support UAS testing once the Federal Aviation Administration finalizes the request for restricted airspace for R-2306-F.

The CDH, located in the Laguna Region, has a 4,400-ft runway and supports rotary-wing aircraft and UAS testing. CDH has four helipads to accommodate aircraft parking. The

facility also includes a taxiway and support facilities. UAVs also are supported at several test runways located in the Cibola Region.

There are no helipads within the Yuma Test Area or KFR. There is a helipad at CDA, two within the Indian Wash Test Area, one near DET/REC targets, one at CM-1, three at IRCC, three at Comanche Flats, one at 4K pad, and one at Cobra Flats Aviation Test Facility. There are three steel-mat helipads within the Cibola Range Complex. In addition, there is one serviceable emergency helipad at the MAA.

3.17.1.4 Railroads

Union Pacific Railroad operates a primary east-west freight corridor known as the Sunset Route just south of YPG. The Sunset Route links the Ports of Los Angeles and Houston and accommodates up to 70 freight trains per day. Passenger rail service is provided by Amtrak (the Sunset Limited combined with the Texas Eagle), with service offered three days each week in each direction. YPG utilizes an off-post location, Blaisdell Siding, for railway transport and evaluation of equipment loads under various railway transport conditions.

3.17.1.5 Transportation of Ordnance and Hazardous Substances

On YPG, industrial processes, routine maintenance activities, testing, and support activities are the primary operations using hazardous substances and generating wastes. Additional hazardous substances present on YPG are lead and asbestos. Munitions and explosive components are transported and stored on YPG and used in testing and training activities.

In accordance with the Hazardous Material Transportation Act (HMTA), tests that require transport and storage of hazardous materials are coordinated with Materiel Test Directorate, Range Safety, and environmental programs prior to transport. YPG has a Hazardous Waste Tracking System for all hazardous wastes generated through industrial activities.

Hazardous wastes generated on YPG are managed using the Less Than 90 Day Hazardous Waste Storage Yard, located in the YTC area. Hazardous wastes and expired hazardous substances accumulate at this location until disposal. No wastes from outside YPG are accepted and no treatment or hazardous wastes disposal occurs on YPG (YPG, 2012b).

3.17.2 Environmental Consequences

The following were evaluated to determine potential impacts to traffic and transportation:

- Disruption or improvement of current road, air, and rail transportation patterns and systems.
- Change in the volume or timing of use of road, air, and rail transportation systems.
- Change in the type of vehicles and aircraft utilizing transportation systems.

Traffic impacts could result in indirect impacts to airspace when the use of airspace increases or decreases, and to hazardous materials when transportation of these substances to and on YPG changes. See Section 3.3 for a discussion of potential airspace impacts and Section 3.9 for a discussion of hazardous materials.

3.17.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to traffic and transportation include:

- Minor to Moderate (less than significant) – Activities that would cause short-term interruptions to traffic flow (e.g., closing, rerouting, or constructing roads, changes in daily or peak-hour traffic volume), but would not substantially negatively affect the YPG mission.
- Minor to Moderate (less than significant) – Activities that would permanently alter or increase use of roads or other transportation system(s) within their current capacity or temporarily exceed the capacity of a transportation system.
- Severe (significant) – Activities that would permanently alter traffic or transportation network(s) and activities that would exceed the capacity of a transportation system long-term. Activities that would substantially negatively affect the YPG mission.

3.17.2.2 Impacts of the No Action Alternative

Under the No Action Alternative there would be no change from existing traffic/transportation conditions on YPG. The Kofa cantonment area and KFR would continue to be inaccessible during and following periods of heavy precipitation due to flooding in Castle Dome Wash. ACPs would not be improved and there could be delays associated with entry to various areas on YPG as a result of inadequate facilities. Improvements to range roads in the Kofa Region would not be made and these roads would continue to deteriorate.

3.17.2.3 Impacts of the Proposed Action/Preferred Alternative

External Roads and Installation Roads. Construction projects would generate additional construction-related vehicle use during working hours on roads on and leading to YPG. Temporary road closures and short-term minor increases in traffic on roads leading to or adjacent to project locations could occur.

There would be yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically. Because there would be no change in traffic volume on YPG as a result of the Proposed Action, no impacts to traffic/transportation would be expected from the increase in testing and training capabilities.

Implementation of multiple projects would result in additional direct impacts to roads on YPG.

- Realignment of Barranca Road in LAAF would result in the temporary disruption of on-post traffic on this road during the realignment.
- Installation of new security gates along Campo Avion Road would result in temporary disruption of on-post traffic during gate installation.
- Construction of ACP improvements would cause temporary disruptions to traffic at CDH, YTC, MAA, and the Kofa cantonment. Upon completion, traffic flow into these areas would be improved.
- Construction of Aberdeen Road flood upgrades would result in temporary disruptions to traffic entering or leaving the Kofa Region. Safety and accessibility of the road during high flow events would be improved following completion of the upgrades.
- Relocation of Safe Haven would involve temporary disruptions from construction of a new road from Aberdeen Road near the ACP. Upon completion, this road would

provide access to the relocated Safe Haven. This project would improve traffic flow into the Kofa Region by improving the process for overnight holding of trucks/cargo that arrive after hours.

- Conversion of Street D near Cox Field into a pedestrian walkway would permanently alter traffic flow in the vicinity. Pedestrian safety would be enhanced by the removal of traffic from the road.
- Improvements to the truck ACP at the Kofa cantonment would cause a temporary disruption of truck traffic during construction and would improve truck traffic flow following construction.

Sections of roads within the YPG cantonment and range areas may have to be temporarily closed during construction and as part of road and ACP improvement activities. During road closures traffic control procedures, including flaggers and posted detours, would minimize any impact on traffic flow. Any impacts would be temporary and minor.

The East Kofa Operations Center (K025) would be staffed and there would be an increase in vehicle traffic on KFR roads. All movement to and from the East Kofa Operations Center would be coordinated through Range Control. This increase in traffic would be minor and would not be expected to adversely affect traffic flow within KFR.

Testing at the DZ that would be created by Project K001, operation of the testing/training complex in the northern portion of the East Arm (K030), and training activities at the East Arm LTA (K021) would result in personnel operating in very remote areas. All movement to and from these locations would be coordinated through Range Control. This increase in traffic would be minor and would not be expected to adversely affect traffic flow within KFR.

Similarly, traffic flow along Aberdeen Road would be disrupted by construction of the flood upgrades. Appropriate traffic control measures would be implemented during construction to minimize the disruption of traffic flow, and may include detours, a temporary crossing of Castle Dome Wash, timing construction to avoid peak traffic volume times, and flaggers. Any impacts would be temporary and minor. Once the flood upgrades are complete, traffic flow to and from the Kofa cantonment and KFR would improve.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Construction-related traffic associated with development of a solar renewable energy facility would travel on US 95. If construction were to coincide with other construction projects in the area, there could be incremental increases in traffic that would create minor temporary cumulative impacts to civilian and military traffic on US 95. No potential for cumulative impacts to traffic would be expected from operation of a solar facility at either site.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. If construction were to coincide with other construction projects in the area, there could be incremental increases in traffic that would create minor temporary cumulative impacts to

regional traffic on US 95. The facility will be operational in 2015 and construction-related traffic impacts would end at that time. No potential for cumulative impacts to traffic would be expected from operation of the project.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to regional traffic. Three of the proposed projects are located on the US 95 corridor and would cause increases in traffic along this corridor during construction, which would negatively contribute to cumulative traffic impacts during the construction period. Because of the interface with a major US highway (US 95), contractors for these projects would be required to use appropriate traffic control procedures to minimize traffic impacts. However, even brief delays associated with construction traffic could incrementally interact with military traffic to create more substantial traffic impediments. However, any such incremental impacts would be temporary and would end when construction was complete.

ADOT has five current or reasonably foreseeable projects in the vicinity of YPG. ADOT would widen and improve the Avenue 3E Bridge in Yuma. In addition, repave a section of Business Route 8 (4th Avenue) from near the California state line to Catalina Drive in Yuma. There are also plans with the Federal Highway Administration, to implement transportation improvements on US 95 from approximately mile marker 42 to mile marker 66, an area that is within or adjacent to the eastern side of the Cibola Region as well as a traffic interchange improvement project at I-8/Araby Road (ADOT, 2013). In addition, a bridge on US 95 over Fortuna Wash is scheduled to be constructed in 2015-2016. No other transportation projects are known or planned that would have potential to interact with the Proposed Action.

The Business Route 8 repaving, Avenue 3E Bridge improvements, I-8/Araby Road traffic interchange improvements, and improvements to SR 195 and US 95 could interact with traffic associated with the Proposed Action. The Proposed Action activities would not affect the overall capacity of the road system to accommodate traffic. Short-term construction projects would result in an increase in traffic volume on off-post roads or YPG roads, but would not generate traffic beyond the capacities of those roads. The impacts would cease upon completion. Road improvements are expected to reduce congestion and improve flow; therefore, they would result in beneficial cumulative impacts once construction is complete.

Air Transportation. Implementation of components of the Proposed Action would result in more efficient air operations on YPG. Expanding the size and location of runways, aircraft parking and shelters, hangars, taxiways, and similar facilities would reduce travel times and allow for greater use of both the diversity and volume of air assets tested.

During construction, activities could be restricted or curtailed and temporary impacts from congestion and delays could occur at locations associated with aircraft launching, landing, fueling, and storage. Upon completion, this work would facilitate the use of aircraft and reduce the potential for conflicts over airspace uses, resulting in a beneficial impact to the testing mission. Impacts would primarily be associated with the following components of the Proposed Action:

- Construct Runway 18/36 extension at LAAF (L002-a).
- Construct helicopter and UAS parking, UAS storage facility, and UAS maintenance hangar, and relocate C-130 CALA at CDH (L007-a-d).

- Construct an aircraft shelter and other infrastructure. Clear a UAS launch/recovery area at Comanche Flats (L014-a).
- Repair landing pad at K-9 Village (L015-a).
- Construct buildings, including two FCS Rotary Class IV hangars, large transient UAS hangar with pad access, and FCS large Class IV hangar and aviation growth hangar to the west of LAAF (L100-b-e).
- Construct USASOC Tactical Hangar at LAAR (L100-f)
- Construct new UAV airfield and hangars, taxiways, UAS flight test area, and other supporting infrastructure at LAAF/MAA (L102-c).
- Construct CASA hangar (L102-d)
- Construct C-130 parking, hot cargo refueling area, and airship hangar at CDH (L103-c-d, L103-f).
- Construct crosswind runway at CDH (L105).
- Construct runway extension, aircraft shelter, and POL storage area, and install hard power/fiber, and communication service, at Phoenix UAS site (C007-a).
- Construct aircraft shelter, aircraft pad, taxiway, graded parking lot, and POL storage area at North UAV Complex (C010 and C046).
- Construct landing pad at CM 1 (C018).
- Construct landing pad at Site 10 Missile Test Facility (C026-b).
- Construct aircraft shelter and infrastructure, including secure building with a ramp, additional buildings, and POL storage area, and clear a launch/recovery area, centered at (-114.356, 33.077) (C021-a-d).
- Construct runway expansion, taxiway, aircraft shelter, building, concrete slab, and infrastructure, and relocate meteorological tower centered at (-114.36, 33.074) (C022-a-e).
- Construct aircraft shelter and infrastructure, including a POL storage area, and clear a launch/recovery area, centered at (-114.363, 33.051) (C023-a-d).
- Construct runway, taxiway, aircraft shelter, and building, and install hard power/fiber, adjacent to existing helicopter pad at IRCC (C025-a-b).
- Construct aircraft shelter and infrastructure, including a POL storage area, and clear a launch/recovery area east of Rocket Alley (C030-a).
- Construct aircraft shelter and infrastructure, including a POL storage area, and clear a launch/recovery area at C-17 (C033-a).
- Construct aircraft shelter and infrastructure, including a POL storage area, and clear a launch/recovery area at SWTR (K004-a).
- Install launch/recovery systems and a GCS trailer at Tower 48 (K006).
- Construct runway and infrastructure west of S-15 Command and Control Shelter (K007-a-b).

- Construct runway, taxiway, aircraft shelter, multiple buildings, POL storage area, and infrastructure, and clear a launch/recovery area at the East Arm (K030).

Demands for use of restricted airspace throughout the Cibola Region for manned and unmanned flight operations would fluctuate depending on annual needs, but the levels of use would be expected to be within the historical use of this airspace. Airspace management is discussed in Section 3.3. The amount of restricted airspace would not increase. No changes to airspace management, beyond those previously analyzed under NEPA, would occur under the Proposed Action. There would be no potential for direct or indirect impacts to private air transportation.

No significant cumulative impacts would be expected from construction and repair of aircraft facilities on YPG. Expansion of testing would result in a greater use of airspace, which could limit the timing and availability of airspace for future use.

Railroads. The Proposed Action does not involve railroads. No direct or indirect impacts would occur.

Ordnance and Hazardous Substances. The Proposed Action would increase transport of ordnance and hazardous substances to and within YPG to reach new testing and training areas. Impacts associated with the transport, storage, and use of ordnance and hazardous substances are discussed in Section 3.9.

3.17.2.4 Mitigation

YPG would implement mitigation to minimize the potential adverse impacts to traffic from temporary road closures. During road closures in the Cibola Region, traffic control procedures, including flaggers and posted detours, would be implemented. During construction of the Aberdeen Road flood upgrades, appropriate traffic control measures would be implemented during construction to minimize the disruption of traffic flow, and may include detours, a temporary crossing of Castle Dome Wash, timing construction to avoid peak traffic volume times, and flaggers.

3.18 Vegetation

3.18.1 Existing Conditions

North of Mexico, the Sonoran Desert consists of two subregions: the Arizona Upland and the Lower Colorado River Valley (Colorado Desert). Each of these subregions extends southward into Mexico, where four additional subregions of the Sonoran Desert occur. The Sonoran Desert is characterized by two wet seasons, with most precipitation typically occurring in winter (December and January) and a second wet period in the summer monsoon period (July through mid-September). Rainfall in the Sonoran Desert typically ranges from 3 to 15 inches per year, but there can be drier years or localities. The Arizona Upland is the eastern part of the U.S. Sonoran Desert and it receives more precipitation than the Colorado Desert subregion. In the Arizona Upland, precipitation totals are nearly equal between winter and summer. The Colorado Desert is the western part of the Sonoran Desert in the U.S. and typically is drier and hotter than the Arizona Upland, with a greater disparity between summer and winter precipitation (Spellenberg, 2003; Phillips and Comus, 2000). YPG is in the Colorado Desert.

In the Colorado Desert of Arizona, trees are uncommon and limited to areas where water flows. Columnar cacti, such as saguaro, are less common than in the Arizona Upland due to less moisture availability, and grow more widely scattered and smaller than in the Arizona Upland subregion. Ironwood (*Olneya tesota*), smoketree (*Psoralea arguta*), palo verdes (*Parkinsonia* spp.), and desert willow (*Chilopsis linearis*) are relatively common along washes (Spellenberg, 2003). Bajadas are dominated by creosote bush (*Larrea tridentata*), which also may occur in washes, and white bursage (*Ambrosia dumosa*) or big galleta (*Pleuraphis rigida*) where grasses are a dominant component. Ocotillo (*Fouquieria splendens*), cholla (*Cylindropuntia* spp.), prickly pear (*Opuntia* spp.), and barrel cacti (*Ferrocactus* spp.) also are obvious components of the vegetation (Spellenberg, 2003).

Mesquite bosques, or woodlands, consist of mainly mesquite trees and a diverse understory, which provides habitat for many species. Bosques in the Southwest typically occur as narrow strips along riparian zones, however on YPG they occur in isolated patches varying in size and are mostly not associated with defined drainages. A survey of bosques on YPG was completed in 2009 (AZGFD, 2011e) and determined that bosques may vary in size from 0.5 ac to over 40 ac in size on YPG.

Vegetation on YPG is adapted to the hot, arid environment, where summer daytime temperatures can exceed 120 degrees Fahrenheit (Spellenberg, 2003). Open plains are sparsely covered with drought-tolerant shrubs, grasses, and cacti. The most common plant species on YPG is creosote bush, which occurs over large areas or mixed with combinations of ocotillo, bursage (*Ambrosia deltoidea*), teddy bear cholla cactus (*Cylindropuntia bigelovii*), and foothills palo verde trees (*Parkinsonia microphylla*) depending on landscape position.

Areas of sandy soil support big galleta communities that include foothills palo verde, honey mesquite (*Prosopis glandulosa*), or bursage. The hillsides of YPG typically support brittlebush (*Encelia farinosa*) and other plants including various cacti (such as saguaro, cholla, and prickly pear). Saguaro cacti on YPG are less numerous and more scattered than in the eastern Sonoran Desert. The foothills and mountainous areas typically support a mixed shrub community. The desert washes typically support a variety of woody plants, including palo verde, ironwood, smoketree, mesquite, and catclaw acacia (*Senegalia greggii*). Larger washes support bosques of smoketree, mesquite, ironwood, and palo verde. The vegetation characteristics of the highest mountain slopes of YPG are similar to those of the Arizona Upland Subdivision of the Sonoran Desert; these YPG slopes sustain sparse populations of saguaro and other cacti, agaves (*Agave deserti*), beargrass (*Nolina microcarpa*), and palo verde (YPG, 2012b).

At YPG, vegetation density noticeably decreases downstream of bajadas heavily impacted by military training, testing, and infrastructure. Bajadas are typically covered with well-developed desert pavement (see Section 3.15 for a discussion of desert pavement). Vegetation densities on YPG are also decreasing in first order rills downstream from unimpacted areas, indicating that natural desert conditions may be changing. Therefore, changes in desert vegetation are likely due to natural and anthropogenic forces (McDonald et al., 2004).

On YPG precipitation rarely exceeds the amount required to infiltrate below surface horizons, and runoff from adjacent piedmonts, especially along channels, is needed to augment the moisture plants receive from other sources. The Av horizon of desert pavement is fine-textured with high clay content, which results in surface water runoff rather than

infiltration. However, the underlying Bw horizon is gravel-rich and, when the Av horizon is disturbed, surface water infiltrates through the lower horizons. Therefore, military land use activities that disrupt the Av horizon of desert pavement can change the frequency or amount of surface flow along low-order channels and directly impact the ecological condition of vegetation along channels (McDonald et al., 2004).

Non-native and invasive species occur on YPG. The main non-native plants of concern are considered exotic invasive plants and include buffelgrass, Athel tamarisk (*Tamarix aphylla*), salt cedar (*Tamarix* spp. and hybrids), Arabian grass (*Schismus arabicus*), Mediterranean grass, and Sahara mustard. Although buffelgrass only occurs in a few scattered locations, its potential for spread in favorable rainfall years and for carrying ecosystem-changing fires make it YPG's current weed of greatest concern (Merrill, 2012, personal communication). These invasive grasses and Sahara mustard increase fuel loads and carry fire well, resulting in larger and more intense wildfires. Sahara mustard skeletons blow in the wind and may pile up along fence lines in masses up to 10 ft high. Sahara mustard is considered the most detrimental non-native species on YPG due to its impact on wildlife, native plants, and potentially the mission of YPG (YPG, 2012b). Many native vegetation species are poorly adapted to fire and the intense wildfires can result in drastic changes to the vegetation. Puncturevine (*Tribulus terrestris*) is actively controlled in cantonment areas, but this species has not spread outside of developed portions of YPG.

At present, YPG implements an invasive species management program. A Draft Invasive Species Management Plan has been developed and is expected to be finalized in 2013. A program to establish exclusion, monitoring, and eradication of all exotic invasive plants on YPG is in the beginning stages by the Environmental Sciences/Natural Resource Management Department as part of the ongoing INRMP implementation (YPG, 2012b).

3.18.2 Environmental Consequences

The following were evaluated to determine potential impacts to vegetation:

- Permanent loss of vegetation cover due to direct impacts from construction clearing and creation of impervious surfaces such as buildings, roads, or parking areas.
- Temporary direct disturbance to vegetation such as removal of vegetation to accommodate construction staging areas where vegetation is capable of becoming restored to a natural community.
- Direct disturbance of vegetation for testing or test support actions.
- Direct disturbance of vegetation as a result of trampling during dismounted maneuvers, off-road vehicle operation, or operation of test equipment.
- Indirect displacement of native vegetation through invasion by exotic invasive plant species following soil or vegetation-disturbing activities.
- Indirect impacts from accelerated soil erosion as a result of exposed or compacted soils.
- Beneficial impacts that control exotic species or eliminate or reduce the potential for vegetation disturbance during test operations.

Indirect impacts to GHGs (Section 3.2), fire management (Section 3.7), soils (Section 3.15), surface water quality (Section 3.20), and wildlife (Section 3.21) can result when vegetation is disturbed. These are discussed in their respective sections.

3.18.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to vegetation include:

- Minor to Moderate (less than significant) – Activities that would alter the local or regional vegetation patterns; includes consideration of vegetation as wildlife habitat.
- Severe (significant) – Activities that would allow the propagation of non-native plant species.
- Severe (significant) – Activities that would eliminate regional native plant species.
- Severe (significant) – Activities that would segment vegetation such that regional wildlife species are jeopardized.
- Severe (significant) – Activities that would eliminate a vegetation type from YPG or the region.

3.18.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, continuing mission operations would result in impacts to vegetation, as testing and training activities continue in currently authorized areas at currently authorized levels. Vegetation impacts could result from off-road vehicle and equipment activity and maneuvers, dismounted maneuvers, set-up for test operations, and live-fire exercises. Impacts of these activities have been previously evaluated under NEPA in the assessments listed in Section 2.3.2.

The evaluations and analyses presented in the NEPA documents listed in Section 2.3.2 provide an assessment of the potential impacts to vegetation that would result from the No Action Alternative, with testing and training continued at current levels and no new construction. The analyses presented in the NEPA documents listed above are incorporated into this FPEIS by reference.

YPG has prioritized detection and eradication of buffelgrass through its INRMP. This exotic invasive annual grass has been specifically targeted because of its role in carrying wildfire through arid environments. Known occurrences are treated and monitored for regrowth and new occurrences are sought through various detection means. These efforts will benefit native grasses and forbs through elimination of an exotic species that is a superior competitor and will benefit native cacti and woody vegetation through removal of this potential fuel load source.

Range sustainability on YPG is managed through the ITAM program, which is implemented to maintain conditions that realistically simulate conditions in other desert regions for operational testing and training activities. Range management and rehabilitation prevent deterioration of conditions that could adversely affect operational testing and training if allowed to proceed unchecked.

Beneficial impacts associated with replacement of turf with xeriscaping would not occur under the No Action Alternative.

3.18.2.3 Impacts of the Proposed Action/Preferred Alternative

The analysis of potential impacts to vegetation as a result of implementing the Proposed Action is based on the difference in impacts that would occur under the Proposed Action compared to those that would occur under the No Action Alternative. Where there would be a difference in impacts between the Proposed Action and the Preferred Alternative, the difference is discussed. Potential impacts to vegetation could occur from the following activities:

- Building/facility construction
- Utility infrastructure installation (electrical transmission/telecommunications lines)
- Off-road vehicle and equipment testing
- Dismounted maneuver activities
- Munitions testing
- Live-fire training and operational testing
- DZ establishment
- TGP establishment
- Wildfire

Exotic invasive plant species typically consume more water than native species. The potential for exotic invasive plant species to depress shallow groundwater tables is discussed in Section 3.20. The following sections discuss the potential impacts to vegetation that may result in each of the three areas on YPG.

There would be yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8), but these fluctuations would be within the maximum and minimum levels observed historically. Because there would be no increase in the amount of testing and training conducted on YPG, no impacts to vegetation would be expected under the Proposed Action as a result of frequency, intensity, or duration of testing and training events. Impacts to vegetation would result from the establishment of new testing and training activities, as discussed below.

Laguna Region. Within the Laguna Region, new building/facility construction, airfield runway/taxiway construction/improvement, roadway improvements, and ACP improvements would be the primary activities that would cause impacts to vegetation. Limited additions to utility infrastructure would occur in the Laguna Region and these would have minor impacts to vegetation. Expanded dismounted maneuver areas and new vehicle test courses are proposed for parts of the Laguna Region, and the subsequent use of these areas could impact vegetation. A new DZ is proposed for the Laguna Region and would result in vegetation clearing.

Most proposed new building and facility construction would occur in the Laguna Region. Site preparation for construction of buildings would eliminate all vegetation from the area of construction. Additional impervious areas would be created through construction, with the potential for increased stormwater runoff. Scour from erosion as a result of increased runoff could result in loss of vegetation along flow paths.

Proposed construction activities would result in clearing of approximately 350 ac of desert habitat in the Laguna Region, with all vegetation removed from this acreage as a result. These activities would not result in elimination of any native species or specific habitat types from YPG because, although the impacts would be permanent and moderate due to

the area of lost vegetation relative to the size of YPG. Approximately 125 ac of new impervious area would be created. Cleared areas converted to impervious area would have no potential for contributing to the spread of exotic invasive plants on YPG. The remaining approximately 225 ac of cleared desert would have the potential for colonization by exotic invasive species. Most of this area would be within a proposed UAS launch/recovery area (approximately 160 ac) and the remainder would be primarily associated with various range road improvements. This acreage would not be managed through the ITAM program because it is not associated with training areas. Cleared areas converted to impervious area would have no potential for contributing to the spread of exotic invasive plants on YPG. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

There would be potential for increased runoff from the approximately 125 ac of new impervious area. Stormwater controls are discussed in Section 3.20. Without appropriate control measures, increased runoff could result in increased erosion, which could then remove native vegetation through scour. The potential loss of vegetation through scour from erosive water flow could extend off-post and affect vegetation on adjacent downstream properties. During construction, BMPs would be used to stabilize disturbed soils, which would minimize the potential for indirect impacts to vegetation as a result of erosion of exposed disturbed soils from stormwater runoff. See Section 3.15 for a detailed discussion of construction BMPs for soil stability.

Electrical transmission/telecommunications lines would be installed at seven locations in the Laguna Region, with the potential for minor vegetation impacts along the length of new utility line at each of the sites. For analysis purposes, it is assumed that utility line extensions would be an equal mix of above-ground and below-ground infrastructure, with vegetation impacts primarily limited to areas where below-ground installation would occur. Vegetation impacts from aerial lines would be limited to the footprint of the support poles. Below-ground infrastructure would result in complete disturbance to vegetation within the utility corridor. Approximately 0.6 ac would be disturbed from installation of utility lines in the Laguna Region. While the disturbed area would be stabilized to minimize the potential for erosion or spread of exotic invasive plant species, the impacts would be long-term because desert vegetation recovers slowly following disturbance, due to the harsh environment and the limited availability of water. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas. Installation of utility lines would not result in any species being eliminated from YPG and no identified habitat types would be lost. Impacts from installation of utility lines would be minor.

Dismounted maneuver activities would occur over a larger area near West LA and K-9 Village. The LTA at West LA would be expanded by 6,520 ac to connect with K-9 Village. Battalion-level dismounted maneuvers simulating deployment in open desert to achieve an urban target in either the West LA or K-9 Village MOUT areas would be conducted. The LTA at Muggins/Middle Mountain (L030) would be expanded up to approximately 6,331 ac under the Preferred Alternative (reduced from 16,640 ac as originally proposed). Additional expanded dismounted maneuver areas would be established in the Laguna Region, which would cover approximately 1,970 ac. No direct impacts to vegetation would result from this

activity. Subsequent use of the area for dismounted maneuvers during operational testing and training activities would have the potential to impact vegetation from trampling by Soldiers. In addition, new vehicle test courses would be established within approximately 9,040 ac in the Laguna Region. Discernible trails would be established, minimizing the potential for soil compaction and for exposing soils outside the boundary of the vehicle test courses. However, when active vehicle testing is not ongoing, these test courses may be used to conduct blended testing or dismounted maneuver training. Trampling of vegetation could occur, but most troop movement would be dispersed to avoid inadvertent creation of discernible trails and would avoid woody desert plants. This would minimize soil compaction and the potential for damage to vegetation. Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and initial troop deployment. Any impact from off-road vehicle operation would be localized and minor. Impacts to vegetation from dismounted maneuver training activities would be expected to be negligible with continued implementation of the ITAM program.

Wildfire adversely affects desert vegetation. Within the Laguna Region, wildfires are suppressed and do not substantially alter desert vegetation. Because no change to the wildfire management program would occur under the Proposed Action, no impacts to vegetation would be expected as a result of wildfire in the Laguna Region. There is potential for increased colonization by exotic invasive plant species if disturbed areas are not managed, which could result in increased fuel loads and greater potential for severe wildfire. This is discussed further in Section 3.7. In addition, implementation of INRMP measures that guide detection and control of exotic invasive plant species would reduce the potential for increased fuel loads and associated increased wildfire risk from these species.

Creation of a DZ would result in disturbance to approximately 45 ac in the Laguna Region. The DZ would not be entirely cleared of vegetation, but disturbance would occur during testing and training activities. Disturbance to vegetation would generally be caused from the dropping of objects directly onto the ground by parachute and from payload retrieval by vehicles. Due to the slow growth of desert vegetation, impacts would be long-term. No species would be lost from YPG and no specific habitat type would be eliminated. The long-term impacts to vegetation from testing and training activities in the DZ would be moderate. There would be increased potential for invasion by herbaceous exotic invasive species as a result of repeated testing and training activities. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

No munitions testing occurs in the Laguna Region and no TGPs would be established in this region. No new off-road vehicle testing in the Laguna Region would occur under the Proposed Action. These activities would not affect vegetation in the Laguna Region.

There would be potential for interaction of activities conducted in the Laguna Region under the Proposed Action and activities proposed in other areas of YPG with regard to vegetation. Because no loss of species or habitat types would result, any incremental contribution to loss of native desert vegetation that would result from implementation of the Proposed Action in the Laguna Region would not be significant. The YPG INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects.

The proposed Cox Field improvements would have a minor beneficial impact on native vegetation. Approximately 8 ac of irrigated turf grass would be replaced with xeriscaping, which would feature native desert vegetation.

Cibola Region. The amount of proposed new building/facility construction in the Cibola Region is much less than that proposed for the Laguna Region. Most of the proposed building/facility construction for the Cibola Region is new construction rather than replacement of existing structures and there would be potential for disturbance to vegetation from construction activities. Numerous airfields across the Cibola Region are proposed for runway expansion and new supporting infrastructure, with the potential for impacts to vegetation at each site. Multiple areas are proposed for use as munitions impact areas, either new areas or expansions of existing munitions impact areas with potential for long-term impacts to vegetation in these areas. Utility infrastructure extensions would occur throughout the Cibola Region and could have moderate impacts to vegetation. New dismantled maneuver areas are proposed for parts of the Cibola Region, and the subsequent use of these areas could impact vegetation. New DZs are proposed for the Cibola Region, and 23 new TGPs would be established in the Cibola Region to support testing activities. Both of these activities would affect vegetation.

Proposed construction activities would result in clearing of approximately 740 ac of desert habitat in the Cibola Region, with all vegetation removed from this acreage as a result. These activities would not result in elimination of any native species or specific habitat types from YPG because, although the impacts would be permanent and moderate due to the area of lost vegetation relative to the size of YPG. New construction, including paving for runways and airfield support pads, would convert approximately 130 ac of the Cibola Region to impervious surfaces. The remaining approximately 610 ac of cleared desert would have the potential for colonization by exotic invasive species. Most of this area would be within a proposed UAS launch/recovery area (approximately 530 ac) and the remainder would be primarily associated with TGPs and construction of the forward staging area. The permanent impacts to vegetation from construction and paving in the Cibola Region would be moderate. Once construction is complete, no further impacts to vegetation in the Cibola Region would result from operations (testing and training) that would use the new facilities. Cleared areas converted to impervious area would have no potential for contributing to the spread of exotic invasive plants on YPG. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

There would be potential for localized increased runoff from the approximately 130 ac of new impervious area. Stormwater controls are discussed in Section 3.20. Without appropriate control measures, increased runoff could result in increased erosion, which could then remove native vegetation through scour. Depending on the location of the new impervious area, the potential loss of vegetation through scour from erosive water flow could extend off-post and affect vegetation on adjacent downstream properties. During construction, BMPs would be used to stabilize disturbed soils, which would minimize the potential for indirect impacts to vegetation as a result of erosion of exposed disturbed soils from stormwater runoff. See Section 3.15 for a detailed discussion of impacts to soils and construction BMPs for soil stability.

Expansion or creation of DZs would result in disturbance to approximately 980 ac in the Cibola Region. DZs would not be entirely cleared of vegetation, but disturbance would occur during testing and training activities. Disturbance to vegetation would generally be caused by dropping of objects directly on the ground by parachute and from payload retrieval by vehicles. Due to the slow growth of desert vegetation impacts would be long-term. No species would be lost from YPG and no specific habitat type would be eliminated. The long-term impacts to vegetation from testing and training activities in DZs would be moderate. There would be increased potential for invasion by herbaceous exotic invasive species as a result of repeated testing and training activities. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

Electrical transmission and telecommunications lines would be installed to 20 locations in the Cibola Region. For analysis purposes, it is assumed that utility line extensions would be an equal mix of above-ground and below-ground infrastructure, with vegetation impacts primarily limited to areas where below-ground installation would occur. Vegetation impacts from aerial lines would be limited to the footprint of the support poles.

Approximately 16 ac of vegetation would be disturbed from installation of new utility lines in the Cibola Region. Because desert vegetation recovers slowly, due to the harsh environment and the limited availability of water, any impacts from construction of utility lines would be long-term. Installation of utility lines would not result in elimination of any species from YPG and no identified habitat types would be lost. Impacts from installation of utility lines would be moderate. Areas disturbed during installation of new utility lines would be subject to colonization by exotic invasive plant species. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

New and expanded dismounted maneuver areas would be established in the Cibola Region, which would cover approximately 66,400 ac. No direct impacts to vegetation would result from this activity. Subsequent use of the area for dismounted maneuver during operational testing and training activities would have potential to impact vegetation from trampling by Soldiers. Most troop movement would be dispersed to avoid inadvertent creation of discernible trails and would avoid woody desert plants. This would minimize soil compaction and potential for damage to vegetation. Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and initial troop deployment. Any impacts from off-road vehicle operation would be localized and minor. Impacts to vegetation from dismounted maneuver training activities would be expected to be negligible with continued implementation of the ITAM program.

In addition, new vehicle test courses would be established within an area up to 4,644 ac in the Cibola Region. Discernible trails would be established, minimizing the potential for soil compaction and impacts to vegetation outside of the vehicle test courses. However, when vehicle testing is not ongoing, the area may be used to perform blended testing or dismounted maneuver training within the vehicle test course boundary.

Twenty-three new TGP would be established to meet identified testing and training needs in the Cibola Region. Each TGP would cover an area of up to 2.2 ac. Shrubs and other

woody vegetation would be cleared at ground level with minimal soil disturbance to eliminate potential interfere with proposed testing and observations. Up to 50.6 ac of vegetation in the Cibola Region would be cleared. No species loss would be expected from clearing for TGPs. If a TGP would be in an area of native vegetation, the impact could range from minor (limited woody vegetation) to moderate (area predominantly desert shrub vegetation). Because desert vegetation recovers slowly, due to the harsh environment and the limited availability of water, any impacts from establishment of TGPs would be long-term. No regional cumulative impacts to vegetation beyond the boundary of YPG would be expected. There could be increased potential for invasion by herbaceous exotic invasive species as a result of clearing vegetation for TGPs. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas. Clearing for TGPs also could be beneficial, if a selected TGP would be within an area dominated by exotic invasive vegetation. Clearing of such an area would be a minor benefit to desert vegetation. Impacts from vegetation clearing for TGPs could reach approximately 125 ac across YPG within the timeframe for vegetative recovery of a given TGP site. This would constitute a minor cumulative impact to desert vegetation on YPG, but no regional cumulative impacts to vegetation beyond the boundary of YPG would be expected.

There are multiple locations within the Cibola Region where new munitions impact areas would be established or where existing munitions impact areas would be expanded. Approximately 16,300 ac would be converted to munitions impact areas. Of this total, approximately 16,040 ac would receive both inert and explosive fire and approximately 250 ac at JERC I, II, and III would be for inert fire only. There would be no direct impacts to vegetation in these areas from creation of the munitions impact areas. After munitions impact areas are established, there would be the potential for episodic disturbance to vegetation from munitions testing and operational testing or training activities that would fire into these areas. Munitions impact areas that receive only inert fire would be less impacted, as direct impacts to vegetation would be negligible. There would be potential for long-term indirect changes to vegetation as a result of altered growing conditions should inert munitions degrade and release metals or other constituents of concern to the soil.

Wildfire adversely affects desert vegetation, and these impacts are long-term. Within the Cibola Region, most wildfires are allowed to burn due to the risk of firefighters encountering UXO while working to control a fire. Because no change to the wildfire management program would occur under the Proposed Action, no direct change in the potential for vegetation damage from wildfire in the Cibola Region would result. The potential exists for increased colonization by exotic invasive plant species if disturbed areas are not managed, which could result in increased fuel loads and greater potential for severe wildfire. This is discussed further in Section 3.7. In addition, implementation of INRMP measures that guide detection and control of exotic invasive plant species would reduce the potential for increased fuel loads and associated increased wildfire risk from these species.

Use of the new or expanded munitions impact areas could result in increased potential for wildfire to start, which could result in increased risk to vegetation. Clearing for TGPs and airfield/UAS support would create areas with little or no fuel load and would likely reduce the potential for wildfire to spread in the Cibola Region and could result in a long-term benefit to vegetation.

There would be potential for interaction of activities conducted in the Cibola Region under the Proposed Action and activities proposed in other areas of YPG with regard to vegetation. Because no loss of species or habitat types would result, any incremental contribution to loss of native desert vegetation that would result from implementation of the Proposed Action in the Cibola Region would not be significant. The YPG INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects.

Kofa Region. New building/facility construction in the Kofa Region is primarily limited to new or replacement structures at fixed GPs, where previous clearing would limit the potential for impacts to vegetation, and at new training complexes. Utility infrastructure would be extended to six new locations in the Kofa Region and could impact vegetation.

Proposed construction activities would result in clearing of approximately 215 ac of desert habitat in the Kofa Region, with all vegetation removed from this acreage as a result. These activities would not result in elimination of any native species or specific habitat types from YPG because, although the impacts would be permanent and moderate due to the area of lost vegetation relative to the size of YPG. New construction, including paving, creation of a UAS launch/recovery area near SWTR, the East Kofa Operations Center, and the training complex in the northern part of East Arm, would convert approximately 54 ac of the Kofa Region to impervious surfaces. Cleared areas converted to impervious area would have no potential for contributing to the spread of exotic invasive plants on YPG. The remaining approximately 160 ac cleared in the Kofa Region would have potential for colonization by exotic invasive species. Most of this area would be within a proposed UAS launch/recovery area (approximately 156 ac). This acreage would not be managed through the ITAM program because it is not associated with training areas. YPG would modify its INRMP to address invasive plant species control in the newly disturbed areas. Absent future management to control exotic invasive plant species, the impacts to vegetation from displacement of native species could be significant. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of exotic invasive plants into disturbed areas.

Approximately 54 ac of new impervious area would be created in the Kofa Region. All vegetation would be removed from these areas. No species would be lost from YPG and no specific habitat type would be eliminated. The permanent impacts to vegetation from construction and paving in the Kofa Region would be moderate. Because these sites would be covered with impervious surfaces, there would be no potential for exotic invasive plants to colonize the new impervious areas. Once construction is complete, no further impacts to vegetation in the Kofa Region would result from operations (testing and training) that would use the new facilities.

There would be potential for localized increased runoff from the approximately 54 ac of new impervious area in the Kofa Region. Stormwater controls are discussed in Section 3.20. Without appropriate control measures, increased runoff could result in increased erosion, which could then remove native vegetation through scour. Depending on the location of the new impervious area, the potential loss of vegetation through scour from erosive water flow could extend off-post and affect vegetation on adjacent downstream properties. During construction, BMPs would be used to stabilize disturbed soils, which would minimize the potential for indirect impacts to vegetation as a result of erosion of exposed disturbed soils

from stormwater runoff. See Section 3.15 for a detailed discussion of construction BMPs for soil stability.

Electrical transmission and telecommunications lines would be installed to four locations in the Kofa Region. For analysis purposes, it is assumed that utility line extensions would be an equal mix of above-ground and below-ground infrastructure, with vegetation impacts primarily limited to areas where below-ground installation would occur. Vegetation impacts from aerial lines would be limited to the footprint of the support poles.

Approximately 2.7 ac of vegetation would be disturbed from installation of new utility lines in the Kofa Region. Because desert vegetation recovers slowly, due to the harsh environment and the limited availability of water, any impacts from construction of utility lines would be long-term. Installation of utility lines would not result in elimination of any species from YPG and no identified habitat types would be lost. Impacts from installation of utility lines would be moderate and, should any utility lines be installed as aerial lines, the impacts to vegetation would be reduced. Areas disturbed during installation of new utility lines would be subject to colonization by exotic invasive plant species. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

New dismounted maneuver areas would be established in the Kofa Region, which would cover approximately 51,354 ac with implementation of the Preferred Alternative, as selection of a reduced area for K026 would reduce proposed LTA acreage in the Kofa Region by 1,826 ac. No direct impacts to vegetation would result from this activity. Subsequent use of the area for dismounted maneuvers during operational testing and training activities would have the potential to impact vegetation from trampling by Soldiers. Most troop movement would be dispersed to avoid inadvertent creation of discernible trails and would avoid woody desert plants. This would minimize soil compaction and potential for damage to vegetation. Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and initial troop deployment. Any impacts from off-road vehicle operation would be localized and minor. Impacts to vegetation from dismounted maneuver training activities would be expected to be negligible with continued implementation of the ITAM program.

Expansion or creation of DZs would result in disturbance to approximately 305 ac in the Kofa Region. DZs would not be entirely cleared of vegetation, but disturbance would occur during testing and training activities. Disturbance to vegetation would generally be caused by dropping of objects directly on the ground by parachute and from payload retrieval by vehicles. Due to the slow growth of desert vegetation impacts would be long-term. No species would be lost from YPG and no specific habitat type would be eliminated. The long-term impacts to vegetation from testing and training activities would be moderate. There would be increased potential for invasion by herbaceous exotic invasive species as a result of repeated testing and training activities. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas.

There are multiple locations within the Kofa Region where new munitions impact areas would be established or where existing munitions impact areas would be expanded. All of the new and expanded munitions impact areas (26,824 ac under the Preferred Alternative)

in the Kofa Region would be used for inert and explosive fire. There would be no direct impacts to vegetation in these areas from the creation of the munitions impact areas. After munitions impact areas are established, there would be the potential for episodic disturbance to vegetation from munitions testing and operational testing or training activities that would fire into these areas. Munitions impact areas that receive only inert fire would be less impacted, as direct impacts to vegetation would be negligible. There would be potential for long-term indirect changes to vegetation as a result of altered growing conditions should inert munitions degrade and release metals or other constituents of concern to the soil.

Under the Proposed Action, there would be no change to off-road vehicle operation in the Kofa Region. No impacts to vegetation in the Kofa Region, beyond those already authorized and occurring under the No Action Alternative, would result from these activities.

Wildfire adversely affects desert vegetation. Within the Kofa Region, most wildfires are allowed to burn due to the risk of firefighters encountering UXO while working to control a fire. Wildfires usually cause long-term damage to desert vegetation. Because no change to the wildfire management program would occur under the Proposed Action, no direct change in the potential for vegetation damage from wildfire in the Kofa Region would result. The potential exists for increased colonization by exotic invasive plant species if disturbed areas are not managed, which could result in increased fuel loads and greater potential for severe wildfire. This is discussed further in Section 3.7. In addition, implementation of INRMP measures that guide detection and control of exotic invasive plant species would reduce the potential for increased fuel loads and associated increased wildfire risk from these species.

Use of the new or expanded munitions impact areas could result in increased potential for wildfire to start, which could result in increased risk to vegetation. Clearing for TGP's and airfield/UAS support would create areas with little or no fuel load and would likely reduce the potential for wildfire to spread in these areas, which could result in a long-term benefit to vegetation from reduced wildfire spread.

There would be potential for interaction of activities conducted in the Kofa Region under the Proposed Action with activities proposed in other areas of YPG with regard to vegetation. Because no loss of species or habitat types would result, any incremental contribution to loss of native desert vegetation that would result from implementation of the Proposed Action in the Kofa Region would not be significant. Implementation of the YPG INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a commercial-scale renewable solar electrical energy generation facility could result in vegetation clearing on up to 8,900 ac, which could incrementally add to other projects on YPG that remove vegetation and lead to minor cumulative impacts to vegetation.

Impacts Summary. Impacts to vegetation on YPG typically either are permanent, such as where construction or paving eliminates vegetation from an area, or long-term because the harsh environment and the limited availability of water in the desert result in very slow recovery of vegetation following disturbance. There would be unavoidable impacts to vegetation under the Proposed Action. Approximately 2,175 ac of desert vegetation would experience long-term impacts from clearing of desert scrub vegetation for UAS launch/recovery areas and disturbance to vegetation from DZ activities. Another approximately 310 ac would be lost to construction and paving, and up to approximately 204,470 ac would experience intermittent long-term impacts from use as munitions impact areas, vehicle test courses, or dismounted maneuver areas.

Installation of utility infrastructure would affect approximately 20 ac of vegetation. These impacts would be long-term because of the very slow recovery of desert vegetation following disturbance.

All areas of exposed, disturbed soils would be subject to invasion by exotic invasive plant species. Construction BMPs would be used to stabilize disturbed soils, which would minimize the potential for invasion by exotic invasive species. Further, the development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas. Construction BMPs also would reduce the potential for indirect impacts to vegetation as a result of erosion of exposed disturbed soils from stormwater runoff.

Within the Laguna Region, wildfires are suppressed and do not substantially alter desert vegetation. Because no change to the wildfire management program would occur under the Proposed Action, no impacts to vegetation would be expected as a result of wildfire in the Laguna Region. Within the Cibola and Kofa Regions, most wildfires are allowed to burn due to the risk of firefighters encountering UXO. Wildfires in the Cibola and Kofa Regions typically would result in long-term damage to desert vegetation because most native desert species are poorly adapted to fire. Because no change to the wildfire management program would occur under the Proposed Action, no direct change in the potential for vegetation damage from wildfire in the Cibola and Kofa Regions would result. There is potential for increased colonization by exotic invasive plant species in any areas where soils would be disturbed under the Proposed Action, if disturbed areas are not managed. This could result in increased fuel loads and greater potential for severe wildfire. This is discussed further in Section 3.7. Use of the new or expanded munitions impact areas could result in increased potential for wildfire ignition, which could result in increased risk to vegetation. Clearing for TGPs and airfield/UAS support would create areas with little or no fuel load and would likely reduce the potential for wildfire to spread in these areas, which could result in a long-term benefit to vegetation from reduced wildfire spread.

There would be no loss of plant species from YPG and no loss of any identified habitat type on the installation as a result of implementation of the Proposed Action. Impacts to vegetation on YPG as a result of the Proposed Action would be moderate and long-term because of the very slow recovery of desert vegetation following disturbance.

There would be a minor beneficial impact on native vegetation from replacement of approximately 8 ac of irrigated turf grass at Cox Field with xeriscaping that would feature native desert vegetation.

There would be potential for interaction of activities conducted under the Proposed Action with other current activities conducted in other areas on YPG with regard to vegetation. Because no loss of species or habitat types would result, any incremental contribution to loss of native desert vegetation that would result from implementation of the Proposed Action would not be significant. The YPG INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects. Implementation of INRMP measures that guide detection and control of exotic invasive plant species would reduce the potential for increased fuel loads and associated increased wildfire risk from these species.

The cumulative effect of incremental loss of vegetation from clearing within YPG from all proposed activities would be moderate. Past and reasonably foreseeable future activities also could interact with the effects of the Proposed Action concerning impacts to vegetation. Because all impacts to vegetation resulting from the Proposed Action would be confined within the boundary of YPG and because there would be no loss of species or specific habitat types, it is not expected that vegetation impacts of the Proposed Action would interact with off-post actions to affect regional vegetation.

Should a renewable energy facility be placed in the Cibola Region, there would be impacts to desert vegetation. No loss of species or habitat types would be expected, but the incremental impact of additional negative impacts to vegetation cannot be determined at this time. A separate, programmatic or site-specific NEPA analysis would be required prior to implementation of a renewable energy project. The site-specific analysis would address the potential for impacts to vegetation and would assess the potential for cumulative effects with regard to the activities in this Proposed Action.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. Approximately 115 ac of the 1,675-ac project area would be completely cleared of vegetation and it is likely that there would be additional vegetation loss during construction. No loss of species or habitat types would be expected and it is anticipated that any contribution to cumulative impacts to vegetation would be insignificant.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to vegetation. While specific impacts are unknown at this time, it is likely that a substantial acreage would be cleared of native vegetation for each project. It is likely that BLM will require appropriate measures, possibly including modifications to site designs to prevent loss of any vegetation type or species from the region. Therefore, any contribution to cumulative impacts to vegetation would be expected to be minor.

3.18.2.4 Mitigation

There would be potential for localized increased runoff from new impervious areas. Without appropriate control measures, increased runoff could result in increased erosion, which could then remove native vegetation through scour. Construction and post-construction stormwater controls would be implemented to facilitate infiltration and reduce the potential for scour. See Sections 3.15 and 3.20 for discussions of stormwater controls. Depending on the location of the new impervious areas, the potential loss of vegetation through scour from erosive water flow could extend off-post and affect vegetation on

adjacent downstream properties. During construction, BMPs would be used to stabilize disturbed soils, which would minimize the potential for indirect impacts to vegetation as a result of erosion of exposed disturbed soils from stormwater runoff. See Section 3.15 for a discussion of construction BMPs for soil stability.

To minimize the potential for impacts to vegetation, YPG would limit surface-disturbing activities to the smallest area practicable and would avoid vegetation where feasible.

YPG would modify its INRMP to address invasive plant species control in the new disturbed areas. Without future management to control exotic invasive plant species, the impacts to vegetation from displacement of native species could be significant.

The YPG ITAM program would help to maintain desert vegetation in areas used for training activities.

3.19 Visual Resources

Visual resources include natural and man-made components of the environment perceived by human receptors. “Aesthetics” refers to beauty in both form and appearance. Perceptions and aesthetic values may vary among individuals depending upon personal preferences.

3.19.1 Existing Conditions

Areas of aesthetic and visual value on YPG and the surrounding area include the Muggins Mountain Wilderness Area, Kofa NWR, Imperial NWR, Trigo Mountains Wilderness Area, including the Needles Eye pinnacle on the Trigo Mountains, Red Bluff Mountain, La Posa Dunes, Mohave Peak, the White Tanks Management Area in East Arm, and Camp Laguna. Some washes that flow into the Colorado River, including Mohave, Gould, Yuma, McAllister, and Indian washes, are also considered areas of special interest, and may provide aesthetic and visual resources to some viewers (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Wilderness and refuge areas provide the public recreational activities such as picnicking, camping, hiking, and sight-seeing.

Due to the rugged mountains and varying topography, the public viewshed on YPG is primarily limited to the views available from US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road. The southern part of the Kofa Region, which is largely unused, can be seen by persons traveling by train. Development on YPG is mainly concentrated in the cantonments, while testing and training areas typically remain open and undeveloped. Most facilities and training and testing areas on YPG are not visible from public roads.

The design and appearance of facilities on YPG are guided by the YPG Installation Design Guide. The guide promotes enhancement of the natural and man-made environments by using consistent architectural themes and standards and aims to improve functionality of the installation. Most development occurs within the valleys of YPG, and development along hillsides and in washes is generally discouraged (AECOM et al., 2011).

3.19.2 Environmental Consequences

This section evaluates the direct, indirect, and cumulative impacts that could alter the associated visual setting of a portion of YPG, as viewed from off-post, by altering the visual landscape associated with that area. The following were evaluated to determine potential impacts to visual resources:

- Permanently alter a site so that a public viewing point or vista is obstructed or otherwise adversely affected.
- Prevent or substantially impair views from a public viewpoint during construction activities.
- Introduce physical features that are substantially out of character with adjacent developed areas.

3.19.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to visual resources include:

- No Impact – Activities that would not be viewable by the general public or that would not create visually observable effects.
- Negligible (less than significant) – Activities that would result in barely barely perceptible changes to the visual environment.
- Minor to Moderate (less than significant) – Activities that may temporarily affect views to the public from US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road resulting from construction, primarily dust, but would be mitigated by construction BMPs.
- Minor to Moderate (less than significant) – Activities that may permanently change the landscape as viewed by the public from US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road resulting from new development, but would be mitigated by proper building design that mimics the landscape.
- Severe (significant) – Activities that may permanently change the landscape as viewed by the public from US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road resulting from testing and training activities.
- Severe (significant) – Activities that may permanently impact areas of aesthetic and visual value as seen from public viewing points.

3.19.2.2 Impacts of the No Action Alternative

Impacts to visual resources associated with the No Action Alternative are indirectly attributable to testing and training activities currently being conducted on YPG. Training and testing activities that may cause airborne dust or use smoke obscurant are known to create a temporary visual obstruction in the form of haze in areas of aesthetic and visual value. The airborne dust is typically caused by ground-based maneuvers, including vehicle testing and training on unpaved tracks or off-road, dismounted maneuvers, and certain smoke obscurant testing. Any impacts to public views would be limited to testing and training activities in proximity to US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road. Most testing and training locations are not visible to the public. Many

tests conducted on YPG involve either proprietary equipment or procedures or are otherwise sensitive. Selection of sites to conduct testing typically avoids areas that may be routinely viewed by the public. This approach minimizes the potential for ongoing activities on YPG to create visual impacts.

The use of lighter-than-air UASs is also part of the current testing and training mission on YPG, and UASs are sometimes visible to the public. When visible to the public, a lighter-than-air UAS appears as a tethered balloon. Depending upon the perception of the viewer, the quality of the viewshed or of areas of aesthetic and visual value may lower. Lighter-than-air UASs typically are deployed at high altitudes and would not obscure views of areas of aesthetic and visual value. Current testing and training activities on YPG, included within the No Action Alternative, have a temporary negative minor impact on visual resources.

Areas of aesthetic and visual value that could be impacted by testing and training activities in the Cibola Region include La Posa Dunes, Needles Eye, Mohave Peak, Cibola NWR, Trigo Wilderness Area, Imperial NWR, Kofa NWR, and the Mohave, Gould, Yuma, McAllister, and Indian washes. Activities in the Laguna Region could impact areas of aesthetic and visual value, which include Camp Laguna, Muggins Mountains, Red Bluff Mountain, and Kofa NWR. Activities in the Kofa Region are generally not visible to the public and would be unlikely to impact areas of aesthetic and visual value such as Kofa NWR, Red Bluff Mountain, and the White Tanks Management Area.

3.19.2.3 Impacts of the Proposed Action/Preferred Alternative

Activities included within the No Action Alternative would continue under the Proposed Action. Because the yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8) would be within the maximum and minimum levels observed historically, no impacts to visual resources would be expected under the Proposed Action as a result of frequency, intensity, or duration of testing and training events. Impacts to visual resources would result from the establishment of new testing and training activities, as discussed below.

Potential temporary minor negative impacts to areas of aesthetic and visual value may occur during construction as a result of airborne dust from the use of heavy equipment and site preparation. Airborne dust may contribute to haze that would partially obscure public views from some view points along US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road. Construction contractors would be required to implement dust suppression practices to limit the amount of airborne dust from construction activities. The view from along these major roads has already been impacted by the presence of overhead transmission lines. The occasional small airborne dust from construction areas would not greatly alter the viewing experience. Airborne dust is further discussed in Section 3.2.

Construction and associated equipment would likely not be visible to the public or would be largely unnoticed due to the operation of military equipment and vehicles in the vicinity. The presence and operation of construction equipment is not expected to alter the public viewing experience from areas near YPG.

Permanent minor negative impacts to the publicly visible landscape could occur as a result of new buildings. New development would generally occur in cantonments in the Laguna and Kofa Regions, which are currently developed and not readily visible to the public during travel along US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road.

New buildings would be designed to blend with the existing visual landscape by using consistent architectural themes in accordance with the YPG Installation Design Guide. New development would also occur in several isolated areas in the Cibola and Kofa Regions. The construction of the complex in the East Arm, at SWTR, the East Kofa Operations Center, and the proposed aerial cable drop in either Cibola Region or Kofa Region would be in remote areas with very little public access. There would be permanent minor negative impacts to the visible landscape.

While testing and training activities typically are located to avoid casual observation by the public, temporary minor negative impacts to areas of aesthetic and visual value may occur as a result of activities on new or expanded training and testing areas. Any visual impacts would typically be limited to testing and training in proximity to US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road, as other testing and training locations would not be visible to the public (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Testing and training activities that include off-road vehicle operation, testing on unpaved tracks, dismounted maneuvers, and certain smoke obscurant testing can create temporary obstruction to public views.

The YPG Environmental Awareness program developed instructions for units training on YPG that include proper procedures and avoidance measures to be implemented during ground-based training activities to minimize potential impacts to areas of aesthetic and visual value. Continued implementation of the ITAM program would maintain or rehabilitate testing and training areas to maintain conditions that realistically simulate conditions in other desert regions. Terrain impacts to washes could also be repaired to reduce negative visual impacts.

Under the Proposed Action, there would be an increase in use of lighter-than-air UASs and the size of these craft also may increase. It is likely that multiple lighter-than-air UAS would be deployed simultaneously across the installation if testing needs warrant. These would likely appear to the public as a tethered balloon and could be used long-term. These lighter-than-air UASs may lower the quality of public views of areas of aesthetic and visual value depending on the perception of the viewer. This incremental increase in lighter-than-air UAS testing could be considered a minor negative cumulative impact.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a commercial-scale renewable solar electrical energy generation facility would change the visual characteristics of the surrounding area and would incrementally contribute to cumulative impacts to visual resources in combination with other development in the region.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. The 1,675-ac project area would change the visual characteristics of the area and incrementally contribute to cumulative impacts to visual resources.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to visual resources. At this time specific details on the project areas are unknown but it is likely the project areas would change the visual character of the area and would create a negative viewing experience for some observers.

3.19.2.4 Mitigation

The use of dust suppression practices during construction would minimize the amount of airborne dust.

New buildings would be designed using consistent architectural themes and standards in accordance with the YPG Installation Design Guide to blend with the existing visual landscape.

The YPG Environmental Awareness program developed instructions for units training on YPG that include proper procedures and avoidance measures to be implemented during ground-based training activities to minimize potential impacts to areas of aesthetic and visual value.

Continued implementation of the ITAM program would maintain or rehabilitate testing and training areas to maintain conditions that realistically simulate conditions in other desert regions. Terrain impacts to washes could also be repaired to reduce negative visual impacts.

3.20 Water Resources

3.20.1 Existing Conditions

YPG is located in the Lower Colorado Planning Area (LCPA), as defined in the Arizona Water Atlas (Arizona Department of Water Resources [ADWR], 2009). Planning Areas are an organizational concept developed by ADWR to provide a regional perspective on supply, demand, and other water resource issues. Water resources in the Yuma area are intensely managed to meet water delivery requirements of U.S. users, to manage high ground-water levels in the valleys, and to manage treaty-mandated water quality and quantity requirements of Mexico (USGS, 2006). The LCPA encompasses some 17,200 square miles, including all or part of four watersheds. The LCPA is within the Basin and Range physiographic province characterized by northwest-southeast trending mountain ranges separated by broad alluvial valleys with elevations generally less than 3,500 ft. With the exception of the Colorado River, there are no perennial streams in the planning area. Historically, the Gila River was considered perennial for most of its length, but during the 20th century farming practices and dams upstream and within the planning area eliminated perennial flows in this river. Broad sandy washes that flow only in response to major precipitation events are the main surface water features in the planning area (ADWR, 2009).

3.20.1.1 Surface Water

There are no wetlands and few permanent surface water sources within the boundaries of YPG. Surface water resources in the area include rivers and impoundments, desert washes, and water tanks. West of YPG, the Colorado River forms the border with California and flows in a southerly direction into Mexico and the Gulf of California. Surface drainage from the western part of YPG flows into the Colorado River. The Gila River flows in a westerly direction and joins the Colorado south of YPG. Surface drainage from the central and eastern parts of YPG flows into the Gila River.

Colorado and Gila Rivers. The Colorado River basin provides a major renewable water supply in the southwestern United States. Most of the water in the Colorado River and its tributaries is used for irrigation, and additional water uses include municipal and industrial supplies and regional environmental systems maintenance. The USGS has more than 50 years of data on the Lower Colorado River for use in understanding the hydrologic system and developing methods to apportion consumptive use of water from the river. The USEPA approved salinity control standards proposed by the Colorado River Basin Salinity Control Forum for three locations in Arizona, including the segment below Imperial Dam. The salinity control standards establish a flow-weighted average annual salinity standard that must be maintained on the Lower Colorado River. At Imperial Dam, the salinity standard is 879 milligrams per liter (mg/L) of sodium (ADWR, 2009). The USGS regularly collects Colorado River water samples at Imperial Dam, and the water is consistently high in sodium. Other water quality issues in the Lower Colorado River include excessive levels of nutrients, metals, endocrine-disrupting compounds, perchlorate, bacteria and pathogens, and sediment. Imperial Dam and Laguna Dam create impoundments along the Colorado River in the vicinity of YPG (ADWR, 2009).

Senator Wash is an off-stream storage facility approximately 2 miles upstream from Imperial Dam. It was constructed to supplement limited storage behind Imperial Dam and Laguna Dam. When sufficient storage is not available at Imperial and Laguna Dams, water is pumped to Senator Wash and used to regulate releases from Imperial Dam. Use of Senator Wash prevents over-deliveries to Mexico during times of high flow and ensures that demands can be met under low flow conditions. Senator Wash Reservoir has a capacity of 13,836 acre-feet at a pool elevation of 251 ft mean sea level (msl). Typically, the pool elevation varies between 210 ft msl and 240 ft msl, fluctuating according to water flow and user demand (Bureau of Reclamation, 1996).

Water in the Gila River is impounded by a series of dams well upstream of the YPG area and flow does not reach the Colorado River under normal conditions. Water quality of the Gila River fluctuates according to water flow rates. During flooding, the river has very good quality, with lower sodium, calcium, and conductivity levels. During low flow conditions, drainage ditches add water from surrounding farmlands to the river, raising the conductivity levels and adding fertilizer and pesticide residues to the water (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

The Lower Colorado and Lower Gila Rivers are listed on the Arizona 2006/2008 303(d) List of Impaired Waters (ADEQ, 2010; USEPA, 2009a). Approximately 32 miles of the Lower Colorado River above the Mexican border are listed as impaired due to low dissolved oxygen levels and elevated selenium levels (ADEQ, 2010). Approximately 28 miles of the Lower Gila River are listed as impaired due to elevated selenium and boron levels (ADEQ, 2010). One other water in the Lower Gila River watershed, Painted Rocks Borrow Pit Lake, is listed as impaired due to low dissolved oxygen levels and elevated levels of Dichlorodiphenyltrichloroethane (DDT) metabolites, toxaphene, and chlordane in fish (ADEQ, 2010; USEPA, 2009a).

Water from YPG arrives at both rivers during flood events when the river water is of better quality. The runoff from YPG typically is of good quality, but the volume is minimal compared to the total river flow during flooding episodes and any contribution from YPG is barely perceptible (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

Desert Washes. Low rates of precipitation and high evapotranspiration rates cause ephemeral streams (desert washes) on YPG to remain dry most of the year. Heavy rains can produce flash flood situations as these washes drain surface water. Washes vary in size, from less than 3 ft in width and depth, to more than a 3,200 ft in width and 33 ft in depth. Many washes contain numerous small channels that change course during major flood events. Desert washes are regulated as waters of the U.S. under Section 404 of the CWA (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). Figures 2-4 through 2-15 depict the major desert washes at YPG and in the surrounding area.

There are several wash systems located in the Cibola Region that drain toward the Colorado River:

- Gould and Mohave washes, in the northern part of the Cibola Region, drain north-northwest.
- Yuma Wash drains to the south in the southwestern portion of the Cibola Region.
- McAllister Wash drains south through the south Cibola Region.
- Indian Wash, fed by numerous smaller washes, drains south-southwest through the Cibola Region.
- Los Angeles Wash, fed by numerous smaller washes, drains south-southwest through the southernmost portion of the Cibola Region.

There are two main washes in the Laguna Region that drain toward the Gila River:

- Vinegaroon Wash is located in the southeast corner of the Laguna Region. The wash is fed by several smaller washes, and drains south and west.
- Castle Dome Wash originates from the Castle Dome Mountains and crosses the Laguna Region, roughly paralleling US 95. The wash also receives runoff from several smaller washes originating in the Kofa Mountains, and drains to the south-southwest.

Runoff in the Kofa Region generally tends to have characteristics of sheet flow rather than confined flood events. The few large washes in the Kofa Region are fed by sheet flow and smaller washes and drain south toward the Gila River:

- Hoodoo Wash originates in the Kofa NWR, traverses the extreme northern section of the Kofa Region, and drains to the southeast.
- King Valley Wash is in the east-central portion of the Kofa Region. It originates in the Kofa NWR and drains to the south-southeast.
- Big Eye Wash is in the central portion of the Kofa Region. It is fed by several smaller washes originating in the Kofa Mountains and drains south-southwest.

Natural and Artificial Water Tanks. YPG has few natural, year-round sources of water. YPG works with AZGFD to construct and maintain 30 man-made, self-sustaining watering holes, which are called wildlife water tanks. There are additional natural water tanks on YPG that are not maintained and that contain water only in response to precipitation that also are used by wildlife when water is available. Some artificial water tanks were constructed specifically to direct wildlife to or away from certain areas on YPG (USAEC, 2005). The natural and artificial water sources used by wildlife are described below:

- Tinajas are naturally occurring, bowl-shaped cavities scoured from bedrock. Tinajas are usually located in the mountain canyons and occur at the base of waterfalls where the bedrock formation changes to softer rock. Rocks trapped in the cavity increase the rate of scouring.
- Enhanced tinajas are tinajas that have been artificially improved to increase water storage capacity and prolong availability. Most retain water throughout the year under normal precipitation conditions.
- Water catchments are artificial storage tanks ranging from 1,500 to 34,500 gallons. AZGFD constructed water catchments in the Cibola and Kofa Regions for wildlife use on YPG.
- Other artificial water sources have developed as a result of leaking landscape irrigation pipes, excess water released from standpipes, or pumping well-water into impoundments. Impoundments on YPG include Lake Alex, near Pole Line Road and north of Red Bluff Mountain in the central portion of the Kofa Region, and Ivan's Well, near Growl Road and Kofa Mohawk Road in the eastern portion of the Kofa Region (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

Wetlands. EPA and USACE regulations define wetlands at 40 CFR 122.2 and 40 CFR 328.3(b) as "...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Further, wetlands that are determined to be waters of the United States are subject to regulation under the CWA and classified as jurisdictional wetlands. Less than 1 percent of Arizona is wetland habitat. Streams and wetlands throughout Arizona were modified or drained, resulting in the historical loss of more than one-third of its original wetlands. The largest and most extensive wetlands in Arizona are along riparian zones and include oxbow lakes, marshes, cienegas, and bosques. Nonriparian areas, such as tinajas, playas, and caldera lakes may support wetlands (USGS, 1999).

There are no wetlands on YPG. Desert washes and natural tinajas on YPG do not support wetland vegetation (Parsons, 2011). The nearest wetlands occur along the Colorado River.

Surface Water Quality. Surface water quality on YPG is protected and maintained through implementation of the Pollution Prevention Act of 1990 (42 U.S.C. 133), the Safe Drinking Water Act (42 U.S.C. 300f), and the CWA.

The CWA protects surface waters by establishing effluent guidelines and water quality standards and by controlling discharges of oil and hazardous substances into surface water. Section 404 of the CWA prohibits dredging or discharges of fill material into waters of the United States without a permit from USACE. On YPG, Section 404 applies to desert washes, and a permit is required for any activity discharging fill material in a desert wash, including road crossings, bank protection, channelization, and new construction (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

The Army Pollution Prevention Program focuses on implementing changes in chemicals, equipment, and processes to achieve a meaningful, cost-effective reduction in the generation of pollution without adverse impacts to mission readiness (U.S. Army, 2011). To minimize

the potential for contamination of surface water, containment basins trap discharges of fuel and prevent discharges to surface water. Two aboveground fuel storage tank areas at the Kofa Firing Front have concrete secondary containment basins. The Laguna Region has eight aboveground fuel storage areas, most of which have concrete secondary containment basins. All fuel storage areas and tanks are monitored and visually inspected for leakage by the Environmental Programs and Logistics offices. The number of fuel storage tanks on YPG may increase or decrease depending on mission requirements. Any tank additions or removals would be subjected to site-specific NEPA analysis prior to being implemented.

Stormwater runoff from the majority of the NRC-licensed DU area is through natural ephemeral washes. The NRC-licensed DU impact area has a DU Catchment Structure, and spent DU rounds are regularly collected by Ammunition Recovery personnel and stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. There is an evaporative lagoon that collects runoff from the DU Catchment Structure and is sized to accommodate a 100-year storm event to minimize the potential for stormwater transport of DU off-post or to other areas on-post. Studies have shown (Obregon, 2013c, personal communication) that DU is contained within the DU licensed area and does not migrate. There is no reasonable potential for off-post migration of DU as the NRC-licensed DU impact area is more than 10 miles from the boundary. The low annual rainfall, generally level gradient of desert pavement, and high specific gravity of DU limit the transport of DU to washes. Insufficient rainfall also limits the flow in washes, thereby limiting the probability of DU transport (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.20.1.2 Groundwater

Regional Setting. Basin and Range aquifers underlie the southern half of Arizona. Basin and Range aquifers in southern Arizona generally occur as unconsolidated gravel, sand, silt, and clay, or partly consolidated sedimentary or volcanic materials that have filled deep fault-block valleys formed by large vertical displacement across faults. Mountain ranges that generally consist of impermeable rocks separate adjacent valleys. When mountains encircle a valley, the aquifer in the valley is isolated, and groundwater is contained within the valley. Most valleys are interconnected, and groundwater typically moves among valleys through the interconnected network of aquifers (Robson and Banta, 1995).

Basin and Range aquifers are the principal sources of groundwater in southern Arizona. The aquifers occur in approximately 120 alluvium-filled basins interspersed between mountain ranges. About 150,000,000 acre-feet of recoverable groundwater is in storage in the upper 100 ft of the saturated sediments of these basins. The groundwater in some basins is extensively utilized, and large water level declines have occurred; in other basins, population is sparse, groundwater is not extensively utilized, and water levels are stable (Robson and Banta, 1995).

Recharge to the Basin and Range aquifers occurs primarily from precipitation in mountains surrounding the basins. Average annual precipitation averages 4 to 8 inches in basins and more than 16 inches in most mountain ranges. The arid climate, with high summer temperatures and large rates of evaporation and transpiration, results in almost all precipitation in basins and most precipitation in mountains being lost to evapotranspiration. Only about 5 percent of the precipitation that falls recharges the basin-fill aquifers. Water not lost to evapotranspiration may infiltrate the soil and upper zones of fractured bedrock,

where it may flow to springs or through fractures and discharge into the basin fill at the base of the mountains. Larger streams in the basins often flow on alluvium that is unconsolidated and highly permeable, enabling rapid infiltration where streams may recharge basin-fill aquifers at considerable distance from the mountains. Small ephemeral streams and water flowing through fractured bedrock generally recharge the aquifers near the mountain fronts. When the stream and aquifer are in direct hydraulic connection, as is the case along the Colorado River in Arizona, surface water and groundwater may function as an interdependent stream-aquifer system. Precipitation supplies about 2,500,000 acre-feet per year of recharge to the Arizona part of the Basin and Range aquifers. Underflow can be a significant component of recharge or discharge in connected basins of Arizona. Groundwater flows through these valleys from high elevation basins to lower elevation basins. Underflow commonly ranges from a few hundred to a few thousand acre-feet per year, with a few larger valleys between basins exhibiting underflow in excess of 30,000 acre-feet per year (Robson and Banta, 1995).

Surface infiltration of water is an important component of recharge to the Basin and Range aquifers. In extensively developed areas, additional recharge may result from human intervention in the hydrologic cycle. Part of the water used to irrigate commercial crops, golf courses, and other vegetation percolates into the basin fill and ultimately recharges the aquifers. Water in reservoirs, canals, and wastewater outfalls also can percolate downward and recharge the aquifers. Up to half of the irrigation water applied to fields in Arizona may ultimately recharge aquifers (Robson and Banta, 1995).

Discharge from the Basin and Range aquifers in Arizona is by evapotranspiration, streams and spring flow, underflow, and well withdrawal. Evapotranspiration is the largest natural component of groundwater discharge. Groundwater can be directly lost to evaporation in areas of shallow water table such as wet playas, marshes, and salt flats. In areas where vegetation obtains most of its water from the water table, such as thick groves of salt cedar or cottonwood, plants transpire large volumes of water. Prior to groundwater development, evapotranspiration was about 1,300,000 acre-feet per year along the Lower Colorado River in Arizona, and about 700,000 acre-feet per year along the Gila River. Natural evapotranspiration can decrease when groundwater withdrawal lowers the water table (Robson and Banta, 1995).

Groundwater discharges to streams or lakes where the water level in the aquifer is above the level of the stream or lake bed. This situation can occur where a constriction in the width or thickness of the aquifer forces groundwater to the surface, or where groundwater flows toward a stream from aquifers of higher elevation on either side of the stream. In arid climates, perennial flows that cross many miles of basin fill are usually maintained by groundwater discharge from underlying aquifers. Prior to groundwater development, the Gila River and its principal tributaries, the Salt, Verde, and San Pedro Rivers, were perennial. These rivers and the Colorado River, which is perennial, received groundwater discharge from aquifers in most of the basins they crossed (Robson and Banta, 1995).

Yuma. Historically, the Colorado and Gila Rivers were the source of nearly all groundwater in the Yuma basin through direct infiltration from the river channels and from annual flooding when high flows overtopped the river banks (ADWR, 2009; Dickinson et al., 2006). Impoundment of water in upstream reservoirs on the Colorado River has resulted in loss of sedimentation and scouring of the river channel, lowering the river profile in the Yuma area

and causing the Colorado River to act as a drain to the groundwater system (Dickinson et al., 2006). Due to upstream impoundments and consumptive use, the Gila River now flows intermittently, causing it to act as a drain to the groundwater system. Groundwater from YPG flows in a general southerly direction to the two rivers.

The major aquifers of the Lower Gila basin are in recent stream alluvium and basin fill. The thickness of the Tertiary and Quaternary basin fill in the Yuma basin may exceed 16,000 ft in some areas, but only the upper 2,000 ft to 2,500 ft is considered hydrologically important because of its transmissive properties. This aquifer is divided into three zones, with the middle, coarse-gravel zone forming the principal water-producing unit. Depths to the coarse-gravel zone begin at about 100 ft in the Colorado and Gila River valleys (ADWR, 2009).

The Yuma basin is the driest region in Arizona, averaging 0 to 4 inches of precipitation per year (ADWR, 2009). Most of the precipitation that falls quickly evaporates in the arid environment, and there is little groundwater recharge from precipitation. The difference between precipitation in the area and potential evapotranspiration rates is estimated at -63 to 0 inches per year (Reilly et al., 2008).

Groundwater quality varies across the Yuma basin, with elevated concentrations of total dissolved solids, arsenic, lead, agricultural pesticides, nitrate, and VOCs in some areas. Historically, the chemical composition of groundwater was similar to that of water in the Colorado and Gila Rivers. Groundwater quality has been altered as a result of agricultural practices (ADWR, 2009).

YPG uses well water for its domestic and industrial operations, drawing from groundwater in two aquifers beneath YPG: a shallow unconfined aquifer in alluvial deposits, and a deep aquifer in consolidated volcanic rocks. The depth to groundwater ranges from 30 ft below ground surface (bgs) in Well X to 750 ft bgs in Well M (ADEQ, 2009). While many groundwater areas in the Desert Southwest have experienced long-term declines in groundwater elevation, groundwater depression has not been observed at YPG. This probably results from the lack of development on YPG (YPG, 2012b). Groundwater basin data indicate that groundwater return flow during years of low flow on the Colorado River remained steady at 79,000 acre-feet per year and did not indicate declines in groundwater elevations (Dickinson et al., 2006). Groundwater quality, consumptive use, and water conservation measures to reduce groundwater demand are discussed in Section 3.5.

3.20.2 Environmental Consequences

There are no wetlands or designated floodplains on YPG. No activities that would disturb water tanks are proposed. The analysis of potential impacts to water resources focuses on desert washes and groundwater. The following were evaluated to determine potential impacts to water resources:

- Construction or other ground disturbance within or in proximity to washes
- Construction site preparation that would extend into the shallow groundwater table
- Deterioration of water quality through increased sedimentation as a result of construction or testing and training activities
- Deterioration of water quality from contaminants such as POLs reaching water courses

- Alteration of morphology of desert washes due to channelization
- Loss of streambed within a desert wash through placement of structures such as culverts
- Increased potential for turbidity as a result of sedimentation from construction site runoff
- Increased potential for sedimentation from testing or training activities in areas adjacent to desert washes
- Alteration of stream flow direction through placement of structures such as surface water crossings
- Alteration of stream flow velocity through channelization or placement of culverts and other types of stream crossings
- Removal of constructed water tanks
- Groundwater subsidence from withdrawal by humans or growth of invasive plants
- Changes in groundwater quality as a result of proposed activities

Potential impacts to groundwater may result from contamination by hazardous materials or hazardous waste and are discussed in Section 3.9. Potential impacts from consumptive use also are addressed in Section 3.5. Contamination of water resources from hazardous materials, including POLs and explosives also would represent an impact to water resources; these impacts are discussed in Section 3.9.

3.20.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to water resources include:

- Negligible (less than significant) – Activities that would result in a change to the resource that is barely perceptible.
- Minor to Moderate (less than significant) – Activities that would result in the introduction of pollutants that directly or cumulatively would not degrade water quality to below federal or state standards.
- Minor to Moderate (less than significant) – Activities that would result in loss of channel through placement of road crossings but would not otherwise alter streamflow characteristics.
- Minor to Moderate (less than significant) – Activities that would result in increased groundwater consumption but that would not deplete groundwater resources.
- Severe (significant) – Activities that would alter patterns of or increase the intensity of flood water movement.
- Severe (significant) – Activities that would result in the introduction of pollutants that directly or cumulatively would degrade water quality to below federal or state standards.
- Severe (significant) – Activities that would result in the introduction of pollutants that further contribute to impairment of a waterbody on the 303(d) List of Impaired Waters.

- Severe (significant) – Groundwater is depleted to the degree that subsidence causes fissures to form.
- Severe (significant) – Activities that would place fill within desert washes other than minimum necessary for a transportation crossing.
- Severe (significant) – Activities resulting in the introduction of pollutants degrading water beyond what is allowed by CWA – Section 404 permitting or NPDES permitting.

3.20.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, testing and training would continue to fluctuate between historical high and low levels and utilize existing facilities and infrastructure with no new construction. Ongoing testing and training occur in specific areas within YPG (Figures 2-4 through 2-12). Tables B-1 through B-3 (Appendix B) identify the testing and training activities that would occur under the No Action Alternative, separated according to the three regions (Laguna, Cibola, and Kofa Regions). No test areas, munitions impact areas, or DZs would be expanded under the No Action Alternative. No construction or demolition would occur under the No Action Alternative. Mission operations would result in minor impacts to water resources, as testing and training activities continue in currently authorized areas at currently authorized levels. Water resources impacts could result from on-road and off-road vehicle use, dismounted maneuvers, set-up for test operations, POL spills, chemical decomposition of military constituents from live-fire exercises, and activities that involve consumptive use of groundwater. Impacts of these activities have been previously evaluated under NEPA as follows in the assessments listed in Section 2.3.2.

The evaluations and analyses presented in the NEPA documents listed in Section 2.3.2 provide an assessment of the potential impacts to water resources that would result from the No Action Alternative, with testing and training continued at current levels and no new construction. The analyses presented in the NEPA documents listed Section 2.3.2 are incorporated into this FPEIS by reference. Activities would comply with the BMPs identified in the SPCCP and ISCP.

Beneficial impacts resulting from a reduction in irrigation water used at Cox Field would not occur under the No Action Alternative.

3.20.2.3 Impacts of the Proposed Action/Preferred Alternative

Impacts to water resources that would occur under the No Action Alternative also would occur under the Proposed Action. This section discusses the potential for additional impacts to water resources as a result of implementing the Proposed Action.

There would be no further degradation of waters listed as impaired on the 303(d) List of Impaired Waters as a result of activities conducted under the Proposed Action.

Exotic invasive plant species grow more rapidly and produce greater biomass in a given time than native Sonoran Desert vegetation. To achieve these accelerated growth rates, exotic invasive plant species consume more water than native vegetation. The local shallow groundwater table could be depressed or depleted, depending on the degree to which exotic invasive plant species occur. At present, YPG implements an invasive species management program. A Draft Invasive Species Management Plan has been developed and is expected to be finalized in 2013. A program to establish exclusion, monitoring, and eradication of all invasive plants on YPG is in the early stages by the Environmental Sciences/Natural

Resource Management Department as part of continued INRMP implementation (YPG, 2012b). Control of exotic invasive plant species would be beneficial to local groundwater resources.

The yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8) would be within the maximum and minimum levels observed historically and there would be no change in personnel assigned to YPG. Therefore, no increase in consumption of groundwater on YPG would occur under the Proposed Action as a result of increases in personnel. The construction of a new WTP at CDH would not result in an increase in consumptive use of groundwater on the installation because this area is already provided potable water by pipe distribution from the Kofa WTP, which is supplied by groundwater.

The Proposed Action would be compliant with Section 438 of the Energy Independence and Security Act of 2007 (EISA) and the *DoD Policy on Implementing Section 438 of the Energy Independence and Security Act (EISA)* (Office of the Undersecretary of Defense, 2010). Under EISA, Section 438 (Title 42, U.S.C., Section 17094) requires that a federal facility with a footprint that exceeds 5,000 ft² use site planning, design, construction, and maintenance strategies for the property to “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to temperature, rate, volume, and duration of flow” (DoD, 2010).

These maintenance strategies may include green infrastructure and low-impact development (LID) practices such as reducing impervious surfaces and using appropriate vegetative practices, porous pavements, and cisterns. USEPA *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA, 2009b) provides guidance on complying with EISA, through the use of LID techniques. EISA Section 438 requirements are separate from and independent of stormwater control requirements under the CWA and are not appropriate for inclusion in stormwater permits unless a State or the USEPA has promulgated regulations for EISA Section 438 requirements that are applicable to all regulated entities under its CWA authority (DoD, 2010). At this time, Arizona has not adopted such a policy. The DoD Unified Facilities Criteria on LID (UFC 3-210-10) mandate stormwater management to maintain hydrologic functions of a site and to mitigate potential adverse impacts of stormwater runoff. Compliance with EISA would minimize the potential for post-construction stormwater from buildings to alter downstream water resources.

The following sections discuss the potential impacts to water resources that may result in each of the three areas on YPG.

Laguna Region. Impacts to water resources and water quality that could occur under the Proposed Action as a result of construction or improvements of buildings and facilities, airfield runways and taxiways, roadways and ACPs, and utility infrastructure would be temporary and localized. Individual project designs would minimize the potential for negative impacts to the extent practicable. Expanded dismounted maneuver areas and new vehicle test courses are proposed for parts of the Laguna Region, and the subsequent use of these areas could impact soils. A new DZ is proposed for the Laguna Region. Appropriate site-specific BMPs would be implemented during and following construction to further reduce the potential for impacts. Most activities that would be implemented in the Laguna

Region would have no potential for direct impacts to water resources, but there would be potential for indirect impacts to these resources.

No munitions testing occurs in the Laguna Region and no TGPs would be established in this region. No new off-road vehicle testing in the Laguna Region would occur under the Proposed Action. These activities would not affect water resources in the Laguna Region.

Construction of the Aberdeen Road flood improvements would require a CWA Section 404 permit from USACE and a CWA Section 401 Water Quality certification from ADEQ. YPG would obtain these authorizations once the design is complete prior to construction. YPG and its construction contractor would be required to comply with all conditions of the CWA Section 404 permit and Section 401 Water Quality certification, including implementation of any mitigation that may be specified as a condition of the CWA Section 404 permit.

No other activities analyzed in detail that are proposed for the Laguna Region would require CWA permitting. Expansion and creation of LTAs and DZs would encompass some areas within washes, but these activities do not require CWA permitting. Should project designs change such that one or more proposed activities would encroach on washes, YPG would obtain appropriate CWA Section 404 permitting in advance of implementing activities with impacts to waters and would comply with all permit conditions.

Direct impacts to water resources would result from the Aberdeen Road flood improvements, which would replace or improve the existing low water crossing (LWC) of Castle Dome Wash between US 95 and the Kofa cantonment. A portion of Castle Dome Wash would be disturbed during construction, with the possibility of both short- and long-term impacts. Short-term impacts would result if a temporary crossing is needed to maintain traffic flow during construction. Aberdeen Road is the main access route for the Kofa cantonment and KFR, and the road must remain passable during construction. Impacts from a temporary crossing would be localized and would end once construction was complete. Long-term impacts would result from construction of improvements to the LWC. It is likely that a small portion of the wash would be lost or converted to artificial substrate as a result of the improvements.

Proposed construction activities in the Laguna Region would result in clearing approximately 350 ac of desert habitat, with 125 ac being converted to new impervious area. Construction impacts could include erosion and sedimentation following vegetation and soil disturbance. The Arizona Pollutant Discharge Elimination System (AZPDES) program, administered by ADEQ, requires that stormwater be treated to the maximum extent practicable to minimize the potential for impacts to water resources. An AZPDES construction general stormwater permit for stormwater discharges from construction activities would be required for each individual and unrelated construction activity. Individual and unrelated construction activities that would disturb less than 5 ac, that would be more than 0.25 mile from an impaired or outstanding Arizona water, and that would have an erosivity value of less than 5 as calculated by the Smart Notice of Intent (NOI) System may qualify for waiver options (ADEQ, 2008; 2011b). If a project meets the waiver requirements, the contractor would be required to comply with the conditions of the AZPDES permit. Proposed activities that are interrelated and dependent would be considered as components of a common plan of development, and these interrelated construction activities would be grouped into one single AZPDES Construction General Permit. This Construction general permit would address all construction impacts of the

interrelated construction activities, including specific component construction activities that would result in less than 1 ac of ground disturbance (ADEQ, 2008; 2011b).

Excluding new or expanded LTAs, which would not affect wildlife water tanks, only one proposed activity would occur in proximity to an established water tank used by wildlife in the Laguna Region. Site selection and preliminary designs for the proposed building and asphalt pad avoid the water tank. Current plans would not result in removal or relocation of any wildlife water tanks. Should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location to maintain the resource. Should removal of a wildlife water tank be necessary, it could affect TES species (Section 3.16) and wildlife (Section 3.21) in the area.

Standard construction BMPs would be coupled with the development and implementation of a Construction SWPPP, which is required by the AZPDES Construction General Permit, to stabilize disturbed soils and minimize the potential for indirect impacts to water resources. The construction contractor would be responsible for developing and implementing a project-specific Construction SWPPP. Following the completion of construction, a site would be stabilized and BMPs implemented to minimize the potential for sediments and contaminants to enter nearby washes. BMPs that could be implemented include, but are not limited to, using infiltration or detention areas during construction to prevent scour from stormwater runoff, installing and maintaining silt fencing around disturbed soils, and mulching disturbed soils to reduce the impact energy of precipitation. Because appropriate BMPs would be implemented, the potential adverse impacts to water quality resulting from construction would be minor.

There would be potential for increased runoff from the approximately 180 ac of new impervious area. Without appropriate control measures, increased runoff could result in increased erosion, which could increase the introduction of sediments and other pollutants to water resources. Appropriate post-construction stormwater controls would minimize the potential for adverse impacts to water resources. Because the decrease in the amount of pervious surface area would be relatively small compared to the size of the aquifer, the negative impact to groundwater recharge would be minor. The volume and rate of stormwater runoff from new impervious areas would likely increase. Post-construction stormwater BMPs, including detention/infiltration areas, would be compliant with Section 438 of EISA, as applicable, and would minimize the potential for impacts to surface hydrology or groundwater. Impacts would be permanent and moderate.

Utility lines would be installed at seven locations in the Laguna Region, with approximately 0.6 ac of land disturbed during installation. While the disturbed area would be stabilized to minimize the potential for erosion, there would be a minor potential for indirect sedimentation impacts to nearby washes. No direct impacts to water resources would be expected. Appropriate BMPs, as discussed for new construction, would be implemented to minimize the potential for erosion. Any indirect impacts to water resources from installation of utility lines would be minor.

Dismounted maneuver activity would occur over a larger area near West LA and K-9 Village. The LTA at West LA would be expanded to connect with K-9 Village (approximately 6,520 ac). Battalion-level dismounted maneuvers simulating deployment in open desert to achieve an urban target in either the West LA or K-9 Village MOUT areas

would be conducted. The LTA at Muggins/Middle Mountain would be expanded up to approximately 6,331 ac under the Preferred Alternative (reduced from 16,640 ac as originally proposed). Additional expanded dismounted maneuver areas would be established in the Laguna Region, which would cover approximately 1,970 ac. In addition, new vehicle test courses would be established within approximately 9,040 ac in the Laguna Region. Discernible trails would be established minimizing soil compaction and the potential for exposing soils outside the boundary of the vehicle test courses. However, when active vehicle testing is not ongoing the vehicle test courses may be used to conduct blended testing or dismounted maneuver training. Soil disturbance would occur during the establishment of the vehicle test course and soil disturbance could occur during the other activities, but most troop movement would be dispersed to avoid inadvertent creation of discernible trails, which would minimize soil compaction and rutting. This would minimize the potential for indirect impacts to water quality from increased erosion/sedimentation. Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and initial troop deployment. Vehicles would not be operated in washes, except for direct crossings. Any direct impact from off-road vehicle operation would be localized and minor. Indirect impacts to water resources from dismounted maneuver training activities and associated off-road vehicle use would be expected to be negligible with continued implementation of the ITAM program.

Creation of a DZ would result in disturbance to approximately 45 ac in the Laguna Region. The DZ would not be entirely cleared of vegetation, but localized soil disturbance would occur during testing and training activities. Disturbance to vegetation would generally be caused by dropping of objects directly on the ground by parachute and from payload retrieval by vehicles. Due to the slow growth of desert vegetation impacts would be long-term. Indirect impacts to surface water resources could occur should excessive sediments be carried to washes. DZs would be established in level areas, so the potential for increased erosion is slight. Continued implementation of the INRMP and ITAM program would minimize the potential for increased erosion from DZs. Any impacts would be expected to be minor.

A new evaporative lagoon has been constructed in the Laguna Region. See Section 3.5 for a discussion of the new Laguna Region evaporative lagoon, which will provide minor indirect benefits to groundwater resources through more efficient handling of wastewater.

Wildfire destroys desert vegetation and creates conditions favorable for accelerated erosion, which can lead to increased sedimentation in washes. Within the Laguna Region, wildfires are suppressed and do not substantially alter precipitation runoff rates or volumes. Because no change to the wildfire management program would occur under the Proposed Action, no indirect impacts to water resources would be expected as a result of wildfire in the Laguna Region. There is potential for increased colonization by exotic invasive plant species if disturbed areas are not managed, which could result in increased fuel loads and greater potential for severe wildfire. This is discussed further in Section 3.7.

There would be little potential for interaction of activities conducted in the Laguna Region under the Proposed Action with activities proposed in other areas of YPG with regard to water resources. Any incremental contribution to degradation or loss of water resources that would result from implementation of the Proposed Action in the Laguna Region would not

be significant. Continued implementation of the INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects.

The proposed Cox Field improvements would have a minor beneficial impact on water resources. Approximately 8 ac of irrigated turf grass would be replaced with xeriscaping, which would feature native desert vegetation. This would result in a slight reduction of consumptive water use in maintaining Cox Field.

Cibola Region. Most of the proposed building/facility construction for the Cibola Region is new construction rather than replacement of existing structures. Numerous airfields across the Cibola Region are proposed for runway expansion and additional supporting infrastructure. Munitions impact area expansion, new dismantled maneuver areas, and a new vehicle test course are proposed for parts of the Cibola Region, and the subsequent use of these areas could cause soil disturbance. Utility infrastructure extensions would occur throughout the Cibola Region. Twenty-three TGP's would be established in the Cibola Region and there would be soil disturbance associated with establishment of these sites.

No projects proposed for the Cibola Region would require CWA permitting. Expansion and creation of LTAs and DZs, as well as creation of new or expanded munitions impact areas, would encompass some areas within washes, but these activities do not require CWA permitting. Should project designs change such that one or more proposed activities would encroach on washes, YPG would obtain appropriate CWA Section 404 permitting in advance of implementing activities with impacts to waters and would comply with all permit conditions.

The proposed WTP at CDH, which would serve CDH and CDA, would not increase demand on groundwater. At present, water is supplied to CDH and CDA from the Kofa WTP via a pipe system. Source water supplied by Well M would increase and existing demands on Well H and Well J would decrease, resulting in no net change in demand from that aquifer. Any impacts to groundwater would be negligible.

Proposed construction activities would result in clearing of approximately 740 ac of desert habitat in the Cibola Region, with all vegetation removed from this acreage as a result. New construction, including paving for runways and airfield support pads, would convert approximately 130 ac of the Cibola Region to impervious surfaces, with soil disturbance occurring during vegetation removal from these areas. Construction impacts could include erosion and sedimentation following vegetation and soil disturbance. An AZPDES construction general stormwater permit for stormwater discharges from construction activities would be required for each individual and unrelated construction activity. Individual and unrelated construction activities that would disturb less than 5 ac, that would be more than 0.25 mile from an impaired or outstanding Arizona water, and that would have an erosivity value of less than 5 as calculated by the Smart NOI System may qualify for waiver options (ADEQ, 2008; 2011b). If a project meets the waiver requirements, the contractor would be required to comply with the conditions of the AZPDES permit. Proposed activities that are interrelated and dependent would be considered as components of a common plan of development, and these interrelated construction activities would be grouped into one single AZPDES Construction General Permit. This Construction General Permit would address all construction impacts of the interrelated construction activities, including specific component construction activities that would result in less than 1 ac of ground disturbance (ADEQ, 2008; 2011b).

Excluding new or expanded LTAs, which would not affect water tanks, only two proposed activities (involving building construction, concrete pad construction, and graded parking) would occur in proximity to established water tanks that are used by wildlife in the Cibola Region. Site selection and preliminary designs for these activities avoid impacts to the water tanks. Current plans would not result in removal or relocation of any wildlife water tanks. Should changes occur that would result in removal of a water tank used by wildlife to implement an activity, any water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location to maintain the resource. Should removal of a water tank used by wildlife be necessary, it could affect TES species (Section 3.16) and wildlife (Section 3.21) in the area.

Standard construction BMPs would be coupled with the implementation of a Construction SWPPP to stabilize disturbed soils and minimize the potential for indirect impacts to water resources. Following the completion of construction, a site would be stabilized and BMPs implemented to minimize the potential for sediments and contaminants to enter nearby washes. BMPs that could be implemented include, but are not limited to, using infiltration or detention areas during construction to prevent scour from stormwater runoff, installing and maintaining silt fencing around disturbed soils, and mulching disturbed soils to reduce the impact energy of precipitation. Because appropriate BMPs would be implemented, the potential adverse impacts to water quality resulting from construction would be minor.

There would be potential for increased runoff from the approximately 130 ac of new impervious area. Without appropriate control measures, increased runoff could result in increased erosion, which could increase the introduction of sediments and other pollutants to water resources, including groundwater. Appropriate post-construction stormwater controls would minimize the potential for adverse impacts to water resources. Because the decrease in the amount of pervious surface area would be relatively small compared to the size of the aquifer, the negative impact to groundwater recharge would be minor. The volume and rate of stormwater runoff from new impervious areas would likely increase. Post-construction stormwater BMPs, including detention/infiltration areas, would be compliant with Section 438 of EISA, as applicable, and would minimize the potential for impacts to surface hydrology or groundwater. Impacts would be permanent and moderate.

Utility lines would be installed at 20 locations in the Cibola Region, with approximately 16 ac of land disturbed during installation. While the disturbed area would be stabilized to minimize the potential for erosion, there would be a minor potential for indirect sedimentation impacts to nearby washes. No direct impacts to water resources would be expected. Appropriate BMPs, as discussed for new construction, would be implemented to minimize the potential for erosion. Any indirect impacts to water resources from installation of utility lines would be minor.

Approximately 530 ac, included in the construction activities discussed above, in the Cibola Region, would be cleared for creation of UAS launch/recovery areas. These UAS launch/recovery areas would have the potential for increased stormwater runoff and sedimentation. Appropriate stormwater controls would minimize the potential for adverse impacts to water resources. Stormwater controls could include but are not limited to, pollution prevention, minimizing exposure, and maximizing infiltration.

Six new or expanded LTAs are proposed in Cibola totaling 66,399 ac (Table 3-18). Use of the areas for dismounted maneuvers during operational testing and training activities would

have potential to impact and disturb soils, but most troop movement would be dispersed to avoid inadvertent creation of discernible trails, which would minimize soil compaction and rutting. This also would minimize the potential for indirect impacts to water quality from increased erosion/sedimentation. Limited off-road vehicle operation could occur in conjunction with dismounted maneuver activities and initial troop deployment. Vehicles would not be operated in washes, except for direct crossings. Any direct impact from off-road vehicle operation would be localized and minor. Indirect impacts to water resources from dismounted maneuver training activities and associated off-road vehicle use would be expected to be negligible with continued implementation of the ITAM program.

TABLE 3-18
Proposed LTAs in Cibola
Yuma Proving Ground

LTA	Acreage
C041 Expand LTA at Middle Mountain	11,230 ac
C060 Create LTA at TOW Town	29,010 ac
C061 Create LTA at JERC I/Saderville	8,437 ac
C062 Create LTA at JERC II	3,503 ac
C063 Create LTA at JERC III	4,312 ac
C064 Create LTA at Yuma Wash	9,907 ac

In addition, a new vehicle test course would be established within an area up to 4,644 ac in the Cibola Region. Discernible trails would be established minimizing soil compaction and the potential for exposing soils outside the boundary of the vehicle test course. However, when active vehicle testing is not ongoing the area may be used to perform blended testing or dismounted maneuver training at the vehicle test course.

There are multiple locations within the Cibola Region where new munitions impact areas would be established or where existing munitions impact areas would be expanded. Approximately 16,300 ac would be converted to munitions impact areas. Of this total, approximately 16,040 ac would receive both inert and explosive fire and approximately 250 ac at JERC I, II, and III would be for inert fire only. There would be no direct impacts to water resources from the creation of the munitions impact areas. Use of explosive fire in munitions impact areas would create localized soil disturbance that would have the potential for soil erosion and subsequent sedimentation in washes. Inert fire impact areas would experience less soil disturbance, but there would be potential for long-term indirect impacts to surface water resources or shallow groundwater resources should the munitions degrade and release MCOCs to the soil.

Expansion or creation of DZs would result in disturbance to approximately 978 ac in the Cibola Region. DZs would not be entirely cleared of vegetation, but disturbance would occur during testing and training activities. Disturbance to vegetation would generally be caused by dropping of objects directly onto the ground by parachute and from payload retrieval by vehicles, which could increase erosion potential in these areas. Due to the slow growth of desert vegetation, impacts would be long-term. Indirect impacts to surface water resources could occur should excessive sediments be carried to washes. DZs would be

established in level areas, so the potential for increased erosion is slight. Continued implementation of the INRMP and ITAM program would minimize the potential for increased erosion from DZs. Any impacts would be expected to be minor.

TGPs would be established at 23 locations in the Cibola Region. TGPs would not be located within washes, so no direct impacts to water resources would result. Each TGP would cover an area of up to 2.2 ac, which would be cleared of vegetation that could interfere with proposed testing and observations. Minor soil disturbance could occur and there would be increased potential for erosion. The potential for indirect impacts to water resources would vary depending on testing needs and the type of vegetation at a proposed TGP. Impacts could range from minor (limited exposed soils from vegetation clearing and not in proximity to a wash) to moderate (extensive soil exposure and in proximity to a wash). Up to 50.6 ac of vegetation would be cleared for TGPs within the Cibola Region, which would create the potential for minor cumulative impacts to surface waters on YPG, but no regional cumulative impacts to surface waters beyond the boundary of YPG would be expected.

There would be little potential for interaction of activities conducted in the Cibola Region under the Proposed Action with activities proposed in other areas of YPG with regard to water resources. Any incremental contribution to degradation or loss of water resources that would result from implementation of the Proposed Action in the Cibola Region would not be significant. Continued implementation of the INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects.

Kofa Region. New building/facility construction in the Kofa Region is primarily limited to new or replacement structures at fixed GPs, where previous clearing and grading have already disturbed soils, and at new training complexes. Utility infrastructure would be extended to six locations and would impact soils.

No projects proposed for the Kofa Region would require CWA permitting. Expansion and creation of dismounted maneuver areas and creation of new or expanded munitions impact areas would encompass some areas within washes, but these activities do not require CWA permitting. Should project designs change such that one or more proposed activities would encroach on washes, YPG would obtain appropriate CWA Section 404 permitting in advance of implementing activities with impacts to waters and would comply with all permit conditions.

Approximately 215 ac of soils would be disturbed to accommodate new construction and utility infrastructure. Construction impacts could include erosion and sedimentation following vegetation and soil disturbance. An AZPDES construction general stormwater permit for stormwater discharges from construction activities would be required for each individual and unrelated construction activity. Individual and unrelated construction activities that would disturb less than 5 ac, that would be more than 0.25 mile from an impaired or outstanding Arizona water, and that would have an erosivity value of less than 5 as calculated by the Smart NOI System may qualify for waiver options (ADEQ, 2008; 2011b). If a project meets the waiver requirements, the contractor would be required to comply with the conditions of the AZPDES permit. Proposed activities that are interrelated and dependent would be considered as components of a common plan of development, and these interrelated construction activities would be grouped into one single AZPDES Construction General Permit, which would address all construction impacts of the

interrelated construction activities, including specific component construction activities that would result in less than 1 ac of ground disturbance (ADEQ, 2008; 2011b).

Standard construction BMPs would be coupled with the implementation of a Construction SWPPP to stabilize disturbed soils and minimize the potential for indirect impacts to water resources. Following the completion of construction, a site would be stabilized and BMPs implemented to minimize the potential for sediments and contaminants to enter nearby washes. BMPs that could be implemented include, but are not limited to, using infiltration or detention areas during construction to prevent scour from stormwater runoff, installing and maintaining silt fencing around disturbed soils, and mulching disturbed soils to reduce the impact energy of precipitation. Because appropriate BMPs would be implemented, the potential adverse impacts to water quality resulting from construction would be minor.

New construction, including paving, creation of a UAS launch/recovery area near SWTR, East Kofa Operations Center, and the training complex in the northern part of East Arm, would convert approximately 54 ac of the Kofa Region to impervious surfaces. There would be potential for increased runoff from the approximately 54 ac of new impervious area. Without appropriate control measures, increased runoff could result in increased erosion, which could increase the introduction of sediments and other pollutants to water resources, including groundwater. Appropriate post-construction stormwater controls would minimize the potential for adverse impacts to water resources. Because the decrease in the amount of pervious surface area would be relatively small compared to the size of the aquifer, the negative impact to groundwater recharge would be minor. The volume and rate of stormwater runoff from new impervious areas would likely increase. Post-construction stormwater BMPs, including detention/infiltration areas, would be compliant with Section 438 of EISA, as applicable, and would minimize the potential for impacts to surface hydrology or groundwater. Impacts would be permanent and moderate.

Utility lines would be installed at nine locations in the Kofa Region, with approximately 2.7 ac of land disturbed during installation. While the disturbed area would be stabilized to minimize the potential for erosion, there would be a minor potential for indirect sedimentation impacts to nearby washes. The construction East Kofa Operations Center would include a new water well for use and this is the only direct impact to water resources expected. No other direct impacts to water resources would be expected. Appropriate BMPs, as discussed for new construction, would be implemented to minimize the potential for erosion. Any indirect impacts to water resources from installation of utility lines would be minor.

Approximately 156 ac in the Kofa Region would be cleared for creation of a UAS launch/recovery area near SWTR. Vegetation clearing would expose soils and could create conditions favorable for increased runoff and erosion, which can lead to increased sedimentation in washes. Appropriate stormwater controls would minimize the potential for adverse impacts to water resources. Stormwater controls could include, but are not limited to, pollution prevention, minimizing exposure of disturbed soils, and enhancing infiltration.

New dismounted maneuver areas would be established in the Kofa Region, which would cover approximately 53,180 ac (51,354 ac under the Preferred Alternative). No direct impacts to vegetation would result from this activity. Subsequent use of the area for dismounted maneuver during operational testing and training activities would have potential to impact

vegetation from trampling by Soldiers. Most troop movement would be dispersed to avoid inadvertent creation of discernible trails and would avoid woody desert plants. This would minimize soil compaction and potential for damage to vegetation and subsequent soil exposure. Limited off-road vehicle operation may occur in conjunction with dismounted maneuver activities and initial troop deployment. Any impacts from off-road vehicle operation would be localized and minor. Impacts to vegetation from dismounted maneuver training activities would be expected to be negligible with continued implementation of the ITAM program.

There are multiple locations within the Kofa Region where new munitions impact areas would be established or where existing munitions impact areas would be expanded. All of the proposed new and expanded munitions impact areas (26,824 ac under the Preferred Alternative) in the Kofa Region would be used for inert and explosive fire. There would be no direct impacts to water resources from the creation of the munitions impact areas. Use of explosive fire in munitions impact areas would create localized soil disturbance that would have the potential for soil erosion and subsequent sedimentation in washes. Inert fire impact areas would experience less soil disturbance, but there would be potential for long-term indirect impacts to surface water resources or shallow groundwater resources should the munitions degrade and release MCOCs to the soil.

Expansion or creation of DZs would result in disturbance to approximately 305 ac in the Kofa Region. DZs would not be entirely cleared of vegetation, but disturbance would occur during testing and training activities. Disturbance to vegetation would generally be caused by dropping of objects directly onto the ground by parachute and from payload retrieval by vehicles, which could increase erosion potential in these areas. Due to the slow growth of desert vegetation, impacts would be long-term. Indirect impacts to surface water resources could occur should excessive sediments be carried to washes. DZs are established in level areas, so the potential for increased erosion is slight. Continued implementation of the INRMP and ITAM program would minimize the potential for increased erosion from DZs. Any impacts would be expected to be minor.

Excluding new or expanded LTAs, which would not affect water tanks, only five proposed activities would occur in proximity to established wildlife water tanks in the Kofa Region. Site selection and preliminary designs for these proposed activities (which involve building renovation, building construction, and road construction) would avoid impacts to wildlife water tanks. Current plans would not result in removal or relocation of any wildlife water tanks. Should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location to maintain the resource. Should removal of a water tank used by wildlife be necessary, it could affect TES species (Section 3.16) and wildlife (Section 3.21) in the area.

There would be little potential for interaction of activities conducted in the Kofa Region under the Proposed Action with activities proposed in other areas of YPG with regard to water resources. Any incremental contribution to degradation or loss of water resources that would result from implementation of the Proposed Action in the Kofa Region would not be significant. Continued implementation of the INRMP and the ITAM program would reduce the potential for incremental interaction with other on-post projects.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a commercial-scale renewable solar electrical energy generation facility would create new impervious surface area over much of an up to approximately 8,900-ac site. Depending on post-construction stormwater controls that would be implemented with development of the facility, there could be increased stormwater runoff that could contribute to cumulative impacts to surface water and groundwater resources. In addition, operation of the facility would result in consumptive use of water. A separate, specific NEPA analysis would be conducted for any such project that would be developed and the amount of operational water consumption would depend on the technology chosen. However, there would be potential for moderate cumulative impacts to groundwater from long-term consumptive use.

Cumulative Impacts Summary. Because potential direct effects to water resources would be confined within the boundaries of YPG and because BMPs and design features would minimize the potential for indirect impacts to offsite waters, there is little potential for interaction of the Proposed Action with other past, present, and reasonably foreseeable projects. As discussed above, no cumulative impacts would be expected on YPG.

Incremental impacts to water quality and groundwater depletion would be the potential routes of interaction with past, present, and reasonably foreseeable off-post actions. Because activities under the Proposed Action would not affect water quality, no cumulative impacts to water quality would be expected as a result of implementation of the Proposed Action. Consumptive use of groundwater would occur under the Proposed Action, but the anticipated use would be small relative to the aquifer capacity. It is expected that minor cumulative impacts to groundwater would result in conjunction with other actions that also consumptively use groundwater.

Excluding new or expanded LTAs, which would not affect water tanks used by wildlife, only eight proposed activities would occur in areas in proximity to wildlife water tanks (Figures 3-9 through 3-11). Any wildlife water tanks that would be removed to implement an activity would be replaced by a comparable new water tank prior to removal to maintain the resource in the area. Replacement wildlife water tanks, if necessary, would be established as close as feasible to the removed water tank. No cumulative impacts to water resources would be expected with regard to water tanks.

YPG has begun investigating the possibility of developing a solar renewable energy facility on the installation to increase YPG's energy security and meet federal mandates and legislative requirements to increase production and consumption of renewable energy resources. This development would be through an EUL with a private company. Solar technologies under consideration by the Army include solar PV, Dish Stirling, and dry-cooled concentrating solar thermal technologies. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). There would be only minor consumptive use during construction of any of the technologies that would not contribute to

cumulative impacts to water resources. Solar PV and Dish Stirling convert sunlight directly into electricity using PV panels and the only operational water demands would be approximately 20 gallons per megawatt-hour (MW-h) of electricity generated to wash solar PV panels to maintain optimum operating efficiency (Tribal Energy and Environmental Information Clearinghouse, 2012; U.S. Department of Energy, undated). Because this would be a continuing demand for water, it would be expected to contribute incrementally to cumulative impacts to water resources.

Solar thermal plants produce electric power by concentrating solar energy using a mirror or lens configuration to generate electricity with steam turbines. Dry-cooled solar thermal plants use up to 80 gallons of water per MW-h generated for mirror washing and operations (U.S. Department of Energy, undated).

Operation of the solar facility would result in consumptive use of water. The amount of operational water depends on the technology chosen during the separate NEPA analysis. However, there would be potential for moderate cumulative impacts to groundwater from long-term consumptive use.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. The project would require over 1,150 acre-feet of water for construction and would require 200 acre-feet of water annually for operation of the dry-cooled facility. Water for the Quartzsite facility would be obtained from the regional aquifers or from the Colorado River. If groundwater is the source, there would be potential for cumulative impacts to groundwater from long-term consumptive use. If water is obtained from the Colorado River, there would be potential for cumulative impacts to surface water from long-term consumptive use. The potential for cumulative impacts to water resources would be minor.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to water resources. These proposed projects would be expected to result in increased demand for water for construction, cleaning, and operation, which could cause cumulative impacts on regional water resources from incremental increased consumption.

3.20.2.4 Mitigation

There would be potential for localized increased runoff from new impervious areas. Without appropriate control measures, increased runoff could affect downstream areas, including off-post lands by creating scour that could remove soils from uplands along washes. Stormwater controls would be implemented to facilitate infiltration and reduce the potential for scour. These controls could include, but would not be limited to:

- Construct replacement tanks for any wildlife water tanks that would be displaced by an activity.
- Use of temporary detention areas with controlled outflow to contain stormwater during construction
- Preservation of existing vegetation –intercepts and retains precipitation and reduces the potential for increased runoff

- Mulching—intercepts and retains precipitation and reduces the potential for increased runoff
- Site design to direct stormwater runoff away from washes and into natural areas where infiltration can occur
- Incorporation of constructed detention/infiltration areas into site designs
- Incorporation of designs to capture stormwater for subsequent use
- Use of pervious surfaces to the extent practicable
- Use of semi-pervious surfaces where appropriate

Facilities would be designed to be compliant with Section 438 of EISA, as applicable, to minimize potential impacts from stormwater runoff. YPG would obtain a CWA Section 404 permit from USACE and a CWA Section 401 Water Quality certification from ADEQ prior to construction of the Aberdeen Road flood improvements. YPG and its construction contractor would be required to comply with all conditions of the CWA Section 404 permit and Section 401 Water Quality certification, including implementation of any mitigation that may be specified as a condition of the CWA Section 404 permit. Should project designs change such that one or more proposed activities would encroach on washes, YPG would obtain appropriate CWA Section 404 permitting in advance of implementing activities with impacts to waters and would comply with all permit conditions.

The INRMP directs YPG to comply with all applicable federal, state, and local laws and regulations, including CWA Section 404 permits, CWA Section 401 water quality certifications, and ADWR Water Rights. As appropriate, the INRMP would be revised to address new activities during subsequent scheduled interagency review.

3.21 Wildlife and Fisheries

3.21.1 Existing Conditions

Wildlife on YPG is typical of the Colorado Desert. Common wildlife species usually have physical and behavioral adaptations to survive the extreme hot and dry conditions that may include light coloration, body armoring, and increased surface area of heat dissipating body parts. Many species also demonstrate nocturnal behavior to avoid the hot daytime temperatures. Mammal, reptile, and bird species are well-represented, while fish and amphibians are limited to perennial waterbodies such as the Colorado and Gila Rivers. The following sections discuss each of these groups within the region and on YPG.

3.21.1.1 Mammals

YPG supports a variety of large and small mammal species. Common large mammals include the desert bighorn sheep, mule deer, coyote, kit fox (*Vulpes macrotis*), gray fox, badger (*Taxidea taxus*), bobcat (*Lynx rufus*), ringtail (*Bassariscus astutus*), and occasional mountain lion. Wild burros and horses also occur on the installation and are managed under the Cibola-Trigo Herd Management Area Plan. Desert bighorn sheep populations are monitored and managed on YPG. See Section 3.16 for a discussion of the protection and management practices established for TES species that occur on YPG (YPG, 2012b).

Common small mammals known to occur on YPG include the rock pocket mouse (*Chaetodipus intermedius*), Merriam's kangaroo rat (*Dipodomys merriami*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail, woodrats (*Neotoma* spp.), Harris' antelope squirrel (*Ammospermophilus harrisi*), round-tailed ground squirrel (*Spermophilus tereticaudus*), California leaf-nosed bat (*Macrotus californicus*), California myotis (*Myotis californicus*), and western pipistrel (*Pipistrellus hesperus*) (YPG, 2012b).

Mesquite bosques provide excellent habitat for mammal species. The most common species observed utilizing the bosques on YPG include mule deer, desert cottontail rabbits, black-tailed jackrabbits, and coyotes. Remote camera surveys determined that larger bosques (10 ac or more in size) received greater wildlife use than small bosques (AZGFD, 2011e).

3.21.1.2 Reptiles and Amphibians

Surveys for reptiles and amphibians were conducted for East Arm and the Cibola Region in 1986 and identified 30 reptile and 3 amphibian species occurring on the installation. The most commonly occurring reptile species included the desert horned lizard (*Phrynosoma platyrhinos*), western whiptail (*Cnemidophorus tigris*), side-blotched lizard (*Uta stansburiana*), sidewinder snake (*Crotalus cerastes*), western diamondback rattlesnake (*Crotalus atrox*), coachwhip (*Masticophis flagellum*), and western shovel-nosed snake (*Chionactis occipitalis*). The red-spotted toad (*Anaxyrus punctatus*), Couch's spadefoot (*Scaphiopus couchii*), and Sonoran desert toad (*Incilius alvarius*) are the three amphibian species known to occur on YPG (YPG, 2012b).

3.21.1.3 Birds

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The MBTA of 1918 established Federal responsibilities to protect birds migrating between the United States and Canada. Subsequent treaties with Mexico (1936), Japan (1972), and the Union of Soviet Socialist Republics (1976) expanded the scope of international protection of migratory birds. Each subsequent treaty was incorporated into the MBTA as an amendment. The provisions of the MBTA are implemented domestically within the signatory countries. Under the MBTA, nearly all species of birds occurring in the United States, their eggs, and their nests are protected. There are 836 bird species protected by the MBTA in the United States, 58 of which are legally hunted as game birds. The MBTA makes it illegal to take (to hunt, pursue, wound, kill, possess, or transport by any means) listed bird species, their eggs, feathers, or nests unless otherwise authorized, such as within legal hunting seasons (USFWS, 2011e). The *National Defense Authorization Act of 2003* authorizes the Armed Forces to take migratory birds incidental to military readiness activities, subject to certain limitations.

The Bald and Golden Eagle Protection Act of 1940, as amended, makes it illegal to take, transport, or possess bald and golden eagles or to engage in commerce in these species with limited allowed exceptions (USFWS, 2011f).

Avifauna. YPG supports an abundant and diverse avifauna typical of the Colorado Desert. All native species occurring on YPG are protected under the MBTA. Common resident birds include the Gambel's quail (*Callipepla gambelii*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), black-throated sparrow (*Amphispiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), black-tailed gnatcatcher (*Poliophtila melanura*), American kestrel

(*Falco sparverius*), turkey vulture (*Cathartes aura*), and red-tailed hawk (*Buteo jamaicensis*) (YPG, 2012b).

The white-winged dove and mourning dove are seasonally abundant on YPG, and many other species migrate through the area as part of the general Pacific Flyway. Surveys conducted in North Cibola Region and East Arm indicated that certain bird species were locally abundant in specific habitats. The rock wren (*Salpinctes obsoletus*) and canyon wren (*Catherpes mexicanus*) were found to be common in high elevation montane habitats dominated by palo verdes and mixed cacti plant communities and two other species, the Costa's hummingbird (*Calypte costae*) and phainopepla (*Phainopepla nitens*), also were seasonally abundant in montane habitats. The sage sparrow (*Amphispiza belli*), LeConte's thrasher (*Toxostoma lecontei*), and horned lark (*Eremophila alpestris*) were identified as typical residents of the sparsely vegetated lower bajadas dominated by creosote bush and bursage or big galleta plant communities (YPG, 2012b).

In the Colorado Desert, the greatest bird use occurs along washes due to greater availability of water and increased habitat diversity (Phillips and Comus, 2000). On YPG, the large washes with bosques of foothills palo verde and smoketree plant associations support the highest densities and richest diversity of desert bird species. Desert washes make up 5 percent of the habitat on YPG, but account for 90 percent of desert birdlife. Common residents of these washes include the lesser goldfinch (*Carduelis psaltria*), common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*). The Lucy's warbler (*Vermivora luciae*) and yellow warbler (*Dendroica petechia*) are seasonal migrants species also commonly observed in these habitats (YPG, 2012b).

Wintering golden eagles are likely to be uncommon or incidental on the YPG and nesting by this species on the installation has not been documented (YPG, 2012b). Nesting by golden eagles has been reported on the Kofa NWR.

3.21.1.4 Fisheries

Of the approximately 36 fish species historically native to Arizona, 21 are federally protected and 1 is extinct. Some native fish species of the Colorado River basin include the roundtail chub (*Gila robusta*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), Colorado squawfish (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), speckled dace (*Rhinichthys osculus*), and striped mullet (*Mugil cephalus*) (Colorado Plateau-Land Use History Northern Arizona [CP-LUHNA], 1998). The desert sucker (*Catostomus clarkii*), Gila longfin dace (*Agosia chryogaster chryogaster*), machete (*Elops affinis*), Sonora sucker (*Catostomus insignis*), speckled dace, and striped mullet are native fishes to the Gila River basin (USBR, 2009).

Natural and man-made water tanks are present on the installation but do not support native fisheries. Naturally occurring waters on YPG are ephemeral and do not provide adequate and sustainable fisheries habitat (YPG, 2012b).

YPG is east of the Colorado River and north of the Gila River. These rivers have been impacted by dam construction and withdrawal of water for irrigation and other human uses, and the native fish populations have been greatly altered (Phillips and Comer, 2000). Both rivers support game fish populations of flathead catfish (*Pylodictis olivaris*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), striped bass (*Morone saxatilis*), bluegill (*Lepomis macrochirus*), redear

sunfish (*Lepomis microlophus*), tilapia (*Oreochromis niloticus niloticus*), striped mullet (*Mugil cephalus*), common carp (*Cyprinus carpio*), black crappie (*Pomoxis nigromaculatus*), and rainbow trout (*Oncorhynchus mykiss*) (Yuma Sun, 2008).

3.21.2 Environmental Consequences

The following were evaluated to determine potential impacts to wildlife and fisheries:

- Permanent loss of habitat due to construction or clearing
- Temporary loss of habitat due to testing and training activities
- Disruption of wildlife behavior due to construction or training and testing activities
- Removal of wildlife water tanks
- Reduction in reproduction and survival rates of wildlife species due to construction or testing and training activities
- Unauthorized take of an MBTA species, including bald and golden eagles, during construction or testing and training activities
- Loss of habitat as a result of sedimentation or migration of toxic substances into off-post waters

3.21.2.1 Significance Criteria

Significance criteria for the analysis of direct, indirect, and cumulative impacts to wildlife and fisheries include:

- Minor to Moderate (less than significant) – Activities that would cause changes in behavior that result in long-term or permanent changes of habitat use.
- Minor to Moderate (less than significant) – Activities that would cause changes in behavior that do not result in a level of physiological stress that substantially affects productivity or survival.
- Minor to Moderate (less than significant) – Activities that would cause changes in behavior that result in temporary displacement of populations or temporary changes in habitat use that do not lead to a substantial decrease in productivity or survival.
- Minor to Moderate (less than significant) – Activities that would affect a fish population but do not cause population-level impacts within local waterways.
- Minor to Moderate (less than significant) – Activities that would result in changes to habitat for birds protected under the MBTA but do not cause population-level effects.
- Severe (significant) – Activities that would cause increases in species mortality rates that jeopardize sustainable regional populations or negatively affect established state wildlife management levels for populations.
- Severe (significant) – Activities that would violate the MBTA or Bald and Golden Eagle Protection Act or otherwise cause discernible population-level impacts at the installation or regional level.
- Severe (significant) – Activities that would lead to population-level impacts to any fish species within local waterways.

- Severe (significant) – Activities that would cause changes in behavior that result in long-term or permanent changes of habitat use.
- Severe (significant) – Activities that would cause changes in behavior that result in physiological stress that substantially affects productivity or survival of a wildlife or fisheries population.
- Severe (significant) – Activities that would cause changes in habitat use that result in permanent displacement of populations from current range or shifts in habitat use that result in substantially decreased productivity or survival.

3.21.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, conditions on YPG would not change and testing and training capabilities would remain at current levels. Ongoing testing and training would occur in specific areas within YPG (Figures 2-4 through 2-12). Tables identifying the testing and training activities that would occur under the No Action Alternative are provided in Appendix B (Tables B-1 through B-3), separated according to the three regions (Laguna, Cibola, and Kofa Regions). No test areas, munitions impact areas, or DZs would be expanded under the No Action Alternative. No construction or demolition would occur under the No Action Alternative. Mission operations would result in minor impacts to wildlife, as testing and training activities continue in authorized areas at authorized levels. Wildlife impacts could result from on-road and off-road vehicle use, illegal hunting, dismounted maneuvers, and test operations (including set-up for these operations). Impacts of these activities have been previously evaluated under NEPA in the assessments listed in Section 2.3.2.

The evaluations and analyses presented in the NEPA documents listed in Section 2.3.2 provide an assessment of the potential impacts to wildlife that would result from the No Action Alternative. The analyses presented in the NEPA documents listed above are incorporated into this FPEIS by reference.

Under the No Action Alternative, YPG would continue to coordinate with AZGFD to rehabilitate injured animals where recovery is practicable. YPG would continue to maintain movement corridors and migratory pathways to allow seasonal movements of animals. YPG would coordinate law enforcement efforts with AZGFD and USFWS to address illegal hunting and habitat degradation associated with unauthorized recreation and illegal hunting. YPG would patrol remote areas and maintain boundary and access signs to deter illegal and unauthorized activities that could negatively affect wildlife.

Wildlife could be startled by noise created by testing or training on YPG and the No Action Alternative, but have not been observed to alter long-term behavior or to exhibit reduced survival as a result of noise from YPG. Testing and training activities have been occurring on YPG since the 1950s and wildlife have become acclimatized to this type of noise disturbance. Disturbance to wildlife from noise created by testing and training on YPG would recur through time, but individual events would be minor and temporary.

Ongoing testing and training activities do not seem to have negatively affected populations of game species. Desert bighorn sheep populations have been stable in the past 10 years and the current population is larger than in the 1980s (YPG, 2012b). Mule deer on YPG increased by approximately 1,000 animals, from 1,256 to 2,254, between 1991 and 2007. No impacts to game species would be expected under the No Action Alternative.

The NRC-licensed DU impact area has a DU Catchment Structure, and spent DU rounds are regularly collected by Ammunition Recovery personnel and stored by YPG Radiation Protection until packaged and transported to a licensed disposal facility by the Army's Radioactive Waste Authority. There is an evaporative lagoon that collects runoff from the DU Catchment Structure and is sized to accommodate a 100-year storm event to minimize the potential for stormwater transport of DU off-post or to other areas on-post. Studies have shown (Obregon, 2013c, personal communication) that DU is contained within the DU licensed area and does not migrate. Therefore, DU would not directly affect any wildlife species. Previous investigations indicate that impacts likely would be limited to small herbivores that are less mobile and have limited foraging ranges rather than large mammals, such as mule deer and desert bighorn sheep (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001).

3.21.2.3 Impacts of the Proposed Action/Preferred Alternative

Impacts to wildlife that would occur under the No Action Alternative also would occur under the Proposed Action. In addition, there would be direct and indirect impacts from construction and use of new or expanded testing and training areas. Direct impacts to wildlife would result from displacement, reduced health from increased stress, or incidental mortality. Indirect impacts to wildlife could result from disturbance that results in nest/den abandonment, reduced foraging time, loss of habitat, or disruption of migratory pathways. The majority of wildlife habitat on YPG would remain intact and would be able to sustain wildlife populations. Additional indirect impacts could result from introduction or spread of exotic invasive plant species that would result in habitat degradation. Disruption of normal activity patterns and loss of habitat would be the primary impacts to wildlife. Limited incidental mortality would likely occur, but would be less than significant at the population level. YPG would continue to maintain movement corridors and migratory pathways for wildlife. This section addresses potential impacts to common wildlife on YPG; potential impacts to TES species are addressed in Section 3.16.

Wildlife on YPG tends to be most abundant near sources of water. Artificial water tanks have been placed to encourage wildlife to relocate away from areas where testing and training activities regularly occur. Only eight proposed activities would be conducted in proximity to artificial water sources (Figures 3-9 through 3-11). The potential for impacts due to proximity to water tanks was discussed in Section 3.20.

Desert bighorn sheep typically utilize the mountainous areas on YPG and may traverse non-mountainous areas (Figures 3-9 through 3-11). Through site selection for proposed activities, YPG has minimized the location of activities in mountainous areas to the extent practicable. Where it is necessary to locate activities in mountainous areas, if practicable, the activities are located near the periphery of mountains to minimize intrusion into mountains. Use of LTAs proposed in mountainous areas could result in disturbance of sheep during lambing and rearing of young. TEMO will coordinate with YPG Natural Resources staff prior to scheduling testing or training events in LTAs in mountainous areas to avoid interference with ewes and lambs during these sensitive times. During other times of the year, dismounted maneuvers in proposed LTAs would have no more than minor impacts to desert bighorn sheep.

Exotic invasive plant species can become established in areas where soils are disturbed, such as construction sites and areas used for testing and training. Exotic invasive plant species

displace native vegetation and offer less habitat value than native plants. Encroachment by exotic invasive plants can eliminate food resources and structural habitat used by native wildlife. Native wildlife species are not adapted to these non-native plants and may not be capable of using them for food or habitat. Exotic invasive plant species consume more water than native vegetation and can reduce available surface or shallow groundwater. The reduction in available water can lead to water stress in wildlife and ultimately to mortality and reduction of population viability. Because exotic invasive plants can affect wildlife through alteration of habitat, increased wildfire, and loss of available water, it is desirable to control these species on YPG. A program to establish exclusion, monitoring, and eradication of exotic invasive plants on YPG is being developed as part of the ongoing INRMP implementation (YPG, 2012b). Control of exotic invasive plant species would be beneficial to wildlife and wildlife habitat.

Wildfire could impact wildlife species on YPG through direct mortality, disruption of reproduction, or loss of habitat. Exotic invasive plant species have the greatest potential to affect wildfire size and intensity through creation of extensive stands with high fuel loads (see Sections 3.7 and 3.18). Areas where native vegetation is cleared or where soils are disturbed are more susceptible to colonization by exotic invasive plant species. Because desert vegetation recovers slowly, wildfire impacts to wildlife habitat are long-term. Depending on size and intensity, impacts from a particular wildfire could range from minor to severe. Measures that would be implemented to minimize the potential for colonization and growth of exotic invasive plant species are discussed in Sections 3.7 and 3.18. Implementation of these measures would minimize the potential for severe impacts to wildlife from wildfire. Control of exotic invasive plant species would reduce wildfire risk to wildlife.

Noise and the physical activity associated with the presence of humans during construction and during testing and training events can cause wildlife to relocate. Animals, such as birds and mammals, may abandon nests or dens in the immediate area of human activities, including abandonment of young. These types of impacts can be minimized during construction by conducting work outside of the reproductive period, but avoidance of this type would not be practicable for testing and training activities. The nearly constant level of testing and training conducted on YPG makes it unlikely that animals would nest or den in proximity to areas used for these purposes unless those animals were already acclimatized to increased human activity. Because most construction would occur in areas where high levels of human activity already occur and because testing and training are ongoing at or near most locations where increases are proposed, it is expected that the potential for nest/den abandonment would be minor. Where feasible, activities would be scheduled to minimize potential conflict with animal reproduction and rearing of young.

Incidental mortality of wildlife and avian species could occur during construction or during testing and training activities. Because these activities would occur over a larger area under the Proposed Action, it is likely that additional incidental mortality would occur compared to the No Action Alternative. No species would be expected to become locally extinct as a result of increased incidental mortality caused by the Proposed Action. Where practicable, wildlife would be relocated from proposed activity areas in accordance with procedures established in the INRMP. Any impacts from incidental mortality associated with construction would be minor and short-term. Incidental mortality from testing and training activities would be minor and long-term.

Development of new facilities or infrastructure can increase predation. As electrical transmission lines, communication towers, or other structures are constructed, avian predators may utilize these areas as hunting perches. A common characteristic of roads in a desert environment is that water shedding from the road surface frequently causes a higher abundance of vegetation along roadsides, which can draw wildlife near roads where they may be hit by vehicles. This roadkill can attract predators such as ravens and coyotes, which further prey upon smaller mammals and reptiles.

Should it become necessary, removal of wildlife water tanks (discussed in Section 3.20) could affect wildlife species. Excluding new or expanded LTAs, which would not affect water tanks, only eight proposed activities would occur in proximity to wildlife water tanks. Areas with water tanks that may be used by wildlife species have been avoided to the extent practicable. Current plans would not result in removal or relocation of any wildlife water tanks, but should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location. Disruption of normal animal activity patterns would likely result from removal and replacement of water tanks, but these impacts would be a short-term and minor with regard to TES species. No population level impacts would be expected.

Managed game species could be impacted by testing and training activities under the Proposed Action. Construction under the Proposed Action would not occur in areas where game management is conducted and would not be expected to impact game species. Potential impacts would be the same as described for general wildlife. Impacts to game species could affect recreational hunting. The potential for the Proposed Action to impact recreational hunting is discussed in Section 3.12. New and expanded testing and training areas would largely be placed outside of preferred habitats of the desert bighorn sheep. Impacts to this species would be expected to be minor and short-term. Mule deer would be expected to experience similar short-term impacts. Both species would be expected to acclimatize to the use of new or expanded testing and training areas with time. Because the yearly fluctuations in the frequency, intensity, or duration of testing and training events (as discussed in Sections 2.1.2 and 2.3.3.8) would be within the maximum and minimum levels observed historically, the level of human activity associated with testing and training would not be expected to increase but it would occur over a larger area.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a renewable solar electric generation facility would result in removal of up to approximately 8,900 ac of desert scrub habitat. There likely would be moderate incremental cumulative impacts to wildlife species that utilize this habitat when this loss is combined with other projects on YPG that would remove desert scrub habitat.

Most impacts to wildlife from the Proposed Action would be indirect impacts from loss of habitat. As directed by the INRMP, YPG would monitor habitat and wildlife and would use adaptive management to maintain biological resources to the maximum extent practicable. The potential for impacts wildlife is discussed by region in the following sections.

Laguna Region. Most proposed construction would occur in the Laguna Region. Because of extensive previous development and high levels of human activity in the Laguna Region, the potential for construction to impact wildlife is less than in other regions of YPG, where less development and activity occur. Construction could displace wildlife from suitable habitat that is within or adjacent to the construction footprint. Displacement could be short-term, where habitat would not be lost, or permanent if the habitat area would be destroyed by construction. Because there is suitable habitat for relocation both on YPG and in the area surrounding the Laguna Region, impacts from displacement in the Laguna Region would be expected to be minor.

In the Laguna Region approximately 350 ac of desert scrub habitat would be removed and, of that total, 125 ac would be converted to impervious surfaces, as discussed in Section 3.18. Approximately 160 ac of the cleared area would be used for a UAS launch/recovery area and the remainder would be mainly associated with range road improvements. Creation of a new DZ would result in the disturbance of approximately 45 ac. Installation of utility lines would remove approximately 0.6 ac of desert scrub habitat. Because of the level of development and human activity in the Laguna Region, loss of habitat would have less impact on wildlife than in other parts of YPG.

Expansion of dismounted maneuver areas and new vehicle test courses would impact respectively approximately 8,490 ac and 9,040 ac, most of which would not be cleared of vegetation, unless required to meet specific testing requirements. Under the Proposed Action, use of the areas added as expanded LTAs would be limited to dismounted maneuvers and would not include the establishment of new concentrated bivouac areas for large units or new off-road vehicle/equipment parking areas. Because vegetation would not be removed and because these areas are in proximity to locations that currently receive high human activity, impacts to wildlife would be expected to be minor.

There is one proposed construction activity in the Laguna Region in proximity to a water tank used by wildlife (Figure 3-9). Site selection and preliminary designs for the proposed building and asphalt pad avoid the water tank. Current plans would not result in removal or relocation of any wildlife water tanks. Should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location to maintain the resource. Disruption of normal activity patterns from removal and replacement of new water tanks would be a short-term, minor impact to wildlife species in the Laguna Region. No population level impacts would be expected. Should removal of a water tank used by wildlife be necessary, it could affect TES species (Section 3.16) and water resources in the area (Section 3.20).

Continued implementation of the INRMP to manage habitat on YPG would minimize the potential for impacts to wildlife from loss of habitat. Wildlife impacts in the Laguna Region would be long-term and minor.

Cibola Region. In the Cibola Region, approximately 740 ac of desert scrub vegetation would be removed and, of that total, 130 ac would be converted to impervious surfaces, as discussed in Section 3.18. Approximately 530 ac of the cleared area would be used as a UAS launch/recovery area and the remainder would be associated with TGPs and the forward staging area. Creation and expansion of DZs would result in disturbance to approximately 978 ac of desert scrub vegetation. Installation of utility lines would disturb approximately 16

ac cleared for installation of utilities. Because of the small area that would be cleared relative to the size of the Cibola Region, impacts to wildlife would be minor to moderate.

Expansion of munitions impact areas would impact approximately 16,300 ac, most of which would not be cleared of vegetation, unless required to meet specific testing requirements. Because vegetation would not be removed and because these areas are in proximity to locations that currently receive munitions impacts and high human activity, impacts to wildlife would be expected to be minor.

YPG would establish 23 new TGPs that would include clearing of up to 50.6 ac of desert scrub habitat in the Cibola Region. Clearing would be spread across the Cibola Region and would be spread in time, but the slow recovery of desert vegetation would result in habitat impacts being long-term. Because individual TGPs would be relatively small and would be dispersed across the landscape, wildlife impacts from TGPs would be expected to be minor and long-term.

Expansion of dismounted maneuver areas would cover approximately 66,400 ac. Under the Proposed Action, use of the areas added as expanded LTAs would be limited to dismounted maneuvers and would not include the establishment of new concentrated bivouac areas for large units or new off-road vehicle/equipment parking areas. No direct impacts to habitat would result from creation of this maneuver area. Dismounted maneuvers typically would result in diffuse movement through the area, which would have negligible impacts on habitat. Dismounted maneuver activities could displace wildlife from the areas during operational testing and training activities. Because operational testing and training activities could occur throughout the year, displacement of wildlife would be expected to recur unless animals acclimatize to the periodic human activity. Because any training activities would be of short duration (typically less than 2 weeks) and there would be extended periods of inactivity between training events, the recurring impacts would be temporary.

Establishment of a new vehicle test course would cover an area up to 4,644 ac. Minor direct impacts to habitat would result from creation of discernible trails. Vehicle testing and dismounted maneuver activities could displace wildlife from the areas during operational testing and training activities. Because testing and training activities could occur throughout the year, displacement could range from temporary to permanent.

There are two proposed construction activities in the Cibola Region in proximity to wildlife water tanks (Figure 3-10). Current plans would not result in removal or relocation of any wildlife water tanks. Should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location to maintain the resource. Disruption of normal activity patterns from removal and replacement of new water tanks would be a short-term, minor impact to wildlife species in the Cibola Region. No population level impacts would be expected. Should removal of a water tank used by wildlife be necessary, it could affect TES species (Section 3.16) and water resources in the area (Section 3.20).

Continued implementation of the INRMP to manage habitat on YPG would minimize the potential for impacts to wildlife from loss of habitat. Impacts of the Proposed Action on wildlife in the Cibola Region would be long-term and moderate.

Kofa Region. New building/facility construction in the Kofa Region is primarily limited to new or replacement structures at fixed GPs, where previous clearing would limit the potential for impacts to vegetation, and at new training complexes. Much like the situation in the Laguna Region, the potential for impacts to wildlife would be minor due to the previous and ongoing disturbance and the level of human activity associated with the fixed GPs.

Proposed construction activities would result in clearing of approximately 215 ac of desert habitat in the Kofa Region, with all vegetation removed from this acreage as a result. New construction, including paving, creation of a UAS launch/recovery area near SWTR, the East Kofa Operations Center, and a training complex in the northern part of East Arm, would convert approximately 54 ac of the Kofa Region to impervious surfaces.

Approximately 156 ac of the cleared area would be used as a UAS launch/recovery area. Approximately 2.7 ac of desert scrub habitat would be cleared for utilities placement and approximately 305 ac of desert scrub habitat would be disturbed by activities related to DZs. Because of the small area that would be cleared relative to the size of the Kofa Region, any impacts to wildlife would be minor.

New dismounted maneuver areas would be established in the Kofa Region, which would cover up to approximately 53,180 ac (51,354 ac under the Preferred Alternative). This Proposed Action limits the use of these LTAs to dismounted maneuvers and does not include the establishment of concentrated bivouac areas for large units or off-road vehicle/equipment parking areas. No direct impacts to habitat would result from this activity. Dismounted maneuvers typically would result in diffuse movement through the area, which would have negligible impacts on habitat. Dismounted maneuver activities could displace wildlife from the areas during operational testing and training activities. Because operational testing and training activities could occur throughout the year, displacement of wildlife would be expected to recur through time unless animals acclimatize to the periodic human activity. Because any training activities would be of short duration (typically less than 2 weeks) and there would be extended periods of inactivity between training events, the recurring impacts would be temporary.

Approximately 29,757 ac of desert scrub habitat would be used for munitions impact area expansion, which would not be cleared except to meet specific testing requirements. Because vegetation would not be removed, because specific testing activities employing munitions live fire involve small numbers of rounds with many designated for air burst, and because these areas are surrounded by large areas that currently receive munitions impacts, impacts to wildlife would be expected to be minor to moderate. Wildlife regularly are observed using or traversing munitions impact areas without incident and it is expected that no more than incidental impacts from munitions testing would result.

There are five proposed construction activities in the Kofa Region in proximity to wildlife water tanks (Figure 3-11). Current plans would not result in removal or relocation of any wildlife water tanks. Should changes occur that would result in water tank removal to implement an activity, any wildlife water tanks that would be removed would be replaced prior to removal by a comparable water tank as close as feasible to the original location to maintain the resource. Disruption of normal activity patterns from removal and replacement of new water tanks would be a short-term, minor impact to wildlife species in the Kofa Region. No population level impacts would be expected. Should removal of a

water tank used by wildlife be necessary, it could affect TES species (Section 3.16) and water resources in the area (Section 3.20).

Continued implementation of the INRMP to manage habitat on YPG would minimize the potential for impacts to wildlife from loss of habitat. Impacts of the Proposed Action on wildlife in the Cibola Region would be long-term and moderate.

Impacts Summary. Wildlife would be temporarily disturbed by construction activities and associated noise. It is likely that wildlife would relocate to similar habitat nearby. After construction is complete, wildlife may resume use of areas adjacent to the construction or acclimatize to the new habitat occupied at the time of displacement. Most proposed construction would occur in cantonment areas or other previously developed locations where wildlife habitat is limited and human activity is common. Impacts from construction would likely be minor and short term at any given location, but would recur through time across the installation.

New dismounted maneuver areas would be established at multiple locations across YPG. Dismounted maneuvers typically would result in diffuse movement through an area, which would have negligible impacts on habitat. Dismounted maneuver activities could displace wildlife from areas during operational testing and training activities. Because operational testing and training activities could occur throughout the year, displacement of wildlife would be expected to recur through time unless animals acclimatize to the periodic human activity. Because any training activities would be of short duration (typically less than 2 weeks) and there would be extended periods of inactivity between training events, the recurring impacts would be temporary.

Excluding new or expanded LTAs, which would not affect wildlife water tanks, only eight proposed activities would occur in areas in proximity to wildlife water tanks (Figures 3-9 through 3-11). Any wildlife water tanks that would be removed to implement an activity would be replaced by a comparable new water tank prior to removal to maintain the resource in the area. Replacement wildlife water tanks, if necessary, would be established as close as feasible to the removed water tank. No cumulative impacts to wildlife would be expected with regard to water tanks.

Wildfire could impact wildlife species on YPG through direct mortality, disruption of reproduction, or loss of habitat. Exotic invasive plant species can affect wildfire size and intensity in areas where native vegetation is cleared or where soils are disturbed during activities. Depending on size and intensity, impacts from a particular wildfire could range from minor to severe. Measures that would be implemented to minimize the potential for colonization and growth of exotic invasive plant species are discussed in Sections 3.7 and 3.18.

New TGP could result in disturbance, including clearing, of up to 50.6 ac of desert scrub habitat in the Cibola Region and up to 26.4 ac of desert scrub vegetation annually in the Kofa Region, but only within isolated areas of up to 2.2 ac each. Clearing would be spread through both space and time, but the slow recovery of desert vegetation would result in habitat impacts being long-term. Because individual TGPs would be relatively small and would be dispersed across the landscape, wildlife impacts from TGPs would be expected to be minor and long-term.

The cumulative effect of incremental habitat loss within YPG from all proposed activities would be moderate. No significant incremental impacts to wildlife from this habitat loss would be expected. Past and reasonably foreseeable future activities also could interact with the effects of the Proposed Action concerning impacts to wildlife. Because all impacts to wildlife resulting from the Proposed Action would be confined within the boundary of YPG and because there would be no loss of species, it is not expected that wildlife impacts of the Proposed Action would interact with off-post actions to affect regional wildlife populations.

YPG is considering development of a commercial-scale renewable solar electrical energy generation facility through use of an EUL with private business. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar energy generation facility on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). Development of a renewable solar electric generation facility could contribute to cumulative impacts to wildlife species that utilize desert scrub habitat through incremental loss of habitat.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. This project would result in the loss of up to 1,675 ac of wildlife habitat. However, it is not anticipated this would contribute to regional cumulative impacts to wildlife populations.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to wildlife and fisheries. While specific impacts are unknown at this time, it is likely that a substantial acreage would be cleared of native vegetation for each project, which would reduce available habitat for native wildlife and likely would contribute to individual mortality for some species. It is likely that BLM will require appropriate measures, possibly including modifications to site designs to prevent loss of any habitat type or species from the region. Therefore, any contribution to cumulative impacts to wildlife and fisheries would be expected to be minor.

3.21.2.4 Mitigation

YPG considered potential impacts to wildlife in selecting locations for proposed activities. Because wildlife species tend to be most abundant near sources of water, YPG avoided placing activities in proximity to artificial water sources to the extent practicable. By avoiding wildlife concentration areas, YPG minimized the potential for impacts to wildlife. When implementing construction projects in areas where wildlife are likely to nest or den, YPG would schedule construction to occur outside the nesting or denning period where practicable.

To minimize the potential for impacts to wildlife YPG would limit surface-disturbing activities to the smallest area practicable and would avoid vegetation where feasible. Any water tanks that would be removed would be replaced by a comparable tank. If removal of a water tank is necessary, a new water tank would be established near the current water tank prior to maintain the resource.

The INRMP (YPG, 2012b) directs the management of natural resources, including wildlife, within YPG. Through continued implementation of the INRMP, YPG utilizes the best

available scientific knowledge and techniques to manage wildlife. To manage and sustain wildlife on YPG, the installation would:

- Survey, monitor, and analyze wildlife population trend information
- Assess wildlife habitat needs
- Manage resources to provide and protect wildlife habitat
- Maintain wildlife movement corridors and migration routes
- Relocate wildlife to maintain, enhance, or restore populations and distributions
- Ensure that water tanks provide the water needed to sustain wildlife populations
- Undertake actions to minimize illegal hunting
- Undertake actions to minimize habitat degradation from unauthorized activities
- Cooperate with AZGFD to obtain wildlife rehabilitation services
- Cooperate with AZGFD and USFWS for wildlife law enforcement

Management of exotic invasive plants on (see Section 3.18) would benefit wildlife through improved habitat conditions. Measures that would be implemented to avoid or minimize impacts to soils (see Section 3.15), vegetation (see Section 3.18), and water resources (see Section 3.20) would provide indirect benefits to wildlife through improved habitat conditions.

3.22 Summary of Impacts and Mitigation

Potential impacts of the alternatives considered in this FPEIS are summarized in Table 3-19. Cumulative impacts and potential minimization and mitigation measures are summarized in Tables 3-20 and 3-21.

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
Air Quality	No change from existing conditions. Benefits from reduced use of portable generators would not occur.	Minor impacts from increased emissions due to operation of minor permanent sources of air emissions created by proposed construction activities, operation of new facilities, vehicle operation to travel to new facilities, and testing and training activities in new locations. Temporary negative impacts due to fugitive dust from construction. Negligible short-term impacts to local air quality as a result of emissions from construction equipment. Minor beneficial impacts from installation of hard power and telecommunications lines with associated reduction in the use of portable generators for testing and training.
Airspace Management	No change from existing conditions.	No change from existing conditions.
Cultural Resources	Potential impact from inadvertent discovery of cultural resources during testing or training activities at current approved locations and levels. Potential for damage to cultural	Potential impact from inadvertent discovery of cultural resources during ongoing activities. Potential impacts to cultural resources in areas not previously surveyed. As appropriate, surveys, SHPO consultation

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
	resources from vandalism. As appropriate, surveys, SHPO consultation under the NHPA, and mitigation would be implemented	under the NHPA, and mitigation would be implemented. Potential for minor to moderate impacts from construction and training activities and from increased potential for inadvertent discovery due to increase in area where activities would be implemented. Potential for damage to cultural resources from vandalism.
Energy/Utilities	<p>Portable generators would continue to be used at current levels and locations.</p> <p>Continued use of utilities at current levels, which would fluctuate depending on annual testing and training needs.</p> <p>Continued use of bottled water and individual RO systems outside of MAA.</p> <p>Satellite uplinks powered by portable generators would continue to be used for telecommunications.</p> <p>Benefits from reduced use of portable generators would not occur.</p> <p>No change from existing conditions for solid waste. No significant increase in non-hazardous waste is anticipated to occur. No significant impacts to the non-hazardous waste landfill capacity would be anticipated.</p> <p>Potential for conflicts in scheduling multiple users with needs to conduct testing in areas free of electromagnetic interference from cellular/radio towers.</p>	<p>Energy/Electricity</p> <p>Beneficial impacts from construction of more energy-efficient buildings.</p> <p>Energy demand would fluctuate depending on annual testing and training needs, with potential for minor to moderate impacts to energy use in the region in years of high levels of testing and training.</p> <p>Minor beneficial impacts from use of solar-powered lights. Moderate long-term beneficial impacts to regional energy consumption from installing hard power to locations currently using portable generators.</p> <p>Minor beneficial impacts to air quality from reduced emissions and to hazardous materials management from reduced transport and handling of fuels following installation of hard power to testing and training locations with associated reduction in generator use.</p> <p>Water</p> <p>No impacts to groundwater as no change in groundwater use is projected. Minor indirect temporary impacts to surface waters during construction.</p> <p>Wastewater</p> <p>New evaporative lagoon at CDH and new sewage lagoon at Kofa cantonment area would have minor beneficial impacts on wastewater utilities.</p> <p>Telecommunications</p> <p>Minor beneficial impacts to air quality from reduced emissions and to hazardous materials management from reduced transport and handling of fuels following installation of hard power to testing and training locations with associated reduction in use of generators and satellite uplinks. Greater flexibility in scheduling users needing test areas free of electromagnetic interference.</p> <p>Solid Waste</p> <p>No significant increase in non-hazardous waste is anticipated to occur. No significant</p>

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		impacts to the non-hazardous waste landfill capacity or regional construction and demolition landfills are anticipated.
Environmental Justice and Protection of Children	No change from existing conditions.	No changes from existing conditions and no impacts.
Fire Management	<p>No change from existing conditions. The potential for wildfires would continue and fire management activities would continue.</p> <p>Fire management from new EOC in the Laguna Region would not occur.</p> <p>YPG will implement the Terms and Conditions specified in the September 9, 2014 BO from USFWS that pertain to fire management in the Kofa Region.</p>	<p>Minor increase in potential for wildfires due to use of new or expanded testing and training locations.</p> <p>Minor to moderate potential for increased fuel load from growth of exotic invasive plant species.</p> <p>New EOC in the Laguna Region would benefit fire management.</p> <p>YPG will implement the Terms and Conditions specified in the September 9, 2014 BO from USFWS that pertain to fire management in the Kofa Region.</p>
Geological Resources	No change from existing conditions.	No change from existing conditions and no impacts.
Hazardous Materials/Hazardous Waste	<p>No change from existing conditions. No changes in volumes of hazardous materials used or hazardous wastes generated. Potential for leaks from on-road and off-road vehicle use and maintenance, POL spills, and chemical decomposition of munitions constituents of concern (MCOCs) would remain.</p> <p>YPG will continue to conduct regular range assessments to determine the potential for migration of MCOCs. YPG would implement appropriate measures should off-range migration that could affect human health or the environment be indicated.</p>	<p>Impacts and sampling described for the No Action Alternative would occur, plus additional potential for minor impacts from leaks associated with vehicle use and maintenance, POL spills, and chemical decomposition of MCOCs as a result of use of new or expanded testing and training areas. Activities would comply with the BMPs identified in the SPCCP and ISCP.</p> <p>Minor short-term increase in hazardous waste generation due to demolition of buildings containing ACMs.</p> <p>Potential for minor impacts from increased use and disposal of certain hazardous materials during testing and training activities.</p> <p>Potential for impacts from installation of air conditioning components.</p> <p>Minor beneficial effects from construction of appropriate down-range facilities to store and contain POLs and reduce the potential for spills.</p> <p>Minor beneficial effects from installation of hard power and telecommunications to testing and training sites that would reduce use of portable generators and also reduce the transport of fuel.</p>
Land Use	No change from existing conditions.	Minor changes from conversion of open space to other uses, but consistent with military land uses.

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		The slight changes in the noise zones that may result from large artillery testing would not require any changes to the land uses designated in the Yuma County 2020 Comprehensive Plan.
Noise	<p>No change from existing conditions. Continued sporadic impacts to wildlife from noise during testing and training activities.</p> <p>Continued potential for complaints from the Martinez Lake area.</p>	<p>The slight changes in the noise zones that may result from large artillery testing would not affect use of surrounding lands outside the installation boundary.</p> <p>Minor long-term impact on wildlife from disturbance from sporadic noise from use of new or expanded testing and training areas.</p> <p>Minor temporary impact to wildlife from noise due to construction activities.</p> <p>Potential for minor disturbance of outdoor conversations due to construction noise. No permanent sensitive human receptors in proximity to construction areas.</p>
Recreation	<p>No change from existing conditions.</p> <p>No new recreation facilities would be constructed.</p>	<p>No impacts to off-post recreational opportunities.</p> <p>Potential for minor to moderate impacts to recreational hunting in the Cibola Hunting Area, Martinez Hunting Area, and the East Arm Hunting Area due to use of new and expanded testing and training areas.</p> <p>Beneficial impacts to other on-post recreation from construction of new park, youth center addition, and improvements to other passive recreational opportunities.</p> <p>Loss of greenspace in MAA that is used by residents for passive recreation from Cox Field improvements.</p> <p>Potential disruption of some on-post recreation during construction.</p>
Safety	<p>No change from existing conditions.</p> <p>Recreational users on the southern portion of Kofa NWR within YPG airspace R-2307 could be exposed to risk when operations on YPG have a safety fan that extends onto Kofa NWR.</p> <p>Safety benefits that would result from the Proposed Action would not occur.</p>	<p>Potential for minor increase in safety incidents due to increase use of new or expanded testing and training areas, but the rate of incidents (expressed per worker hour) would not be expected to change.</p> <p>Minor potential increase in frequency of wildfire ignition due to use of new or expanded testing and training areas.</p> <p>Potential for minor short-term impacts to construction worker safety.</p> <p>Potential minor temporary impacts to traffic safety due to construction-related traffic.</p> <p>Moderate benefits to operational safety due to AT/FP improvements, MEDEVAC helicopter pads, flood upgrades on Aberdeen Road, pedestrian safety from D Street conversion to walkway, and installation of shading at multiple locations.</p>

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
		<p>Minor benefit to personnel safety from installation of hard power and telecommunications in the Cibola and Kofa Regions due to decreased transportation of fuel and portable generators.</p> <p>Minor benefit to personnel safety due to reduced heat stress following installation of new shade structures.</p> <p>Minor benefit to safety from placing overhead wires underground.</p> <p>Moderate benefit from relocating safe haven away from YPG personnel.</p> <p>Recreational users on the southern portion of Kofa NWR within YPG airspace R-2307 could be exposed to risk when operations on YPG have a safety fan that extends onto Kofa NWR.</p>
Socioeconomics	No change from existing conditions. Short-term benefits to local economy from construction would not occur.	<p>Minor short-term beneficial impacts to local economy from purchase of building materials, short-term construction jobs, and secondary spending by construction workers.</p> <p>Potential for negligible to minor impacts on local fuel and water retailers from reduction in demand for these services on YPG.</p>
Soils	No change from existing conditions. Continued impacts to soils from testing and training activities at authorized locations and levels.	<p>Impacts described for the No Action Alternative would continue, but with increased potential for impacts due to use of new or expanded testing and training areas.</p> <p>Increase in disturbed area and disturbance to soils used for dismounted maneuver training, munitions impact areas, DZs, and UAS launch/recovery areas resulting in negligible to minor impacts to soils that are not susceptible to erosion to moderately erodible and moderate impacts to highly erodible soils that are disturbed.</p> <p>Minor impact from establishment of TGPs in the Cibola Region.</p> <p>Long-term indirect impact from degradation of munitions into soils in munitions impact areas.</p> <p>Disturbance due to construction resulting in negligible to minor impacts to soils that are not highly erodible to moderately erodible and moderate impacts to highly erodible soils.</p> <p>Minor impacts from disturbance to soils during installation of utilities.</p>
Threatened and Endangered Species and Species of	No change from existing conditions. Potential for minor impacts to TES species, as	<p>Transient or Incidental Species</p> <p>Negligible to minor impacts likely from displacement during construction, testing, or</p>

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
Concern	testing and training activities continue at existing locations and levels.	<p>training activities.</p> <p>Sonoran Desert Tortoise Long-term moderate impacts from loss of habitat and potential for incidental mortality.</p> <p>Sonoran Pronghorn Long-term minor impacts from visual and auditory disturbance to the experimental population due to testing and training activities. Potential threat to individual pronghorn from munitions testing or UXO. Potential alteration of foraging habitat in the event of wildfire.</p> <p>Banded Gila Monster Minor long-term impacts from loss of habitat and disturbance from construction, testing, and training activities.</p> <p>TES Bat Species Negligible to minor long-term impacts due to loss of foraging habitat.</p> <p>Loggerhead Shrike Moderate long-term impacts from loss of habitat and disturbance caused by construction, testing, and training activities.</p> <p>Western Burrowing Owl Moderate long-term impacts due to loss of habitat and disturbance from construction, testing, and training activities.</p> <p>Parish's Onion Negligible to minor long-term impacts from incidental mortality and due to the slow growth rate of these species.</p> <p>Other TES Plants Minor long-term impacts from clearing of vegetation for construction, testing, and training purposes.</p> <p>Wild Horses and Burros Minor temporary impacts due to construction activities. Minor long-term impacts due to displacement and loss of habitat from establishment of new or expanded testing and training areas.</p> <p>No impacts to other species.</p>
Traffic/Transportation	No change from existing conditions. No new impacts would occur.	<p>Potential increase in temporary road closures and construction-related traffic. Minor short-term impact.</p> <p>Long-term beneficial impacts from improved traffic safety due to flood upgrades, intersection improvements, and range road improvements.</p> <p>Long-term benefits to mission from increased efficiency of military air activities due to new infrastructure.</p>

TABLE 3-19
Impacts by Resource Area
Yuma Proving Ground

Resource Area	No Action Alternative	Proposed Action
Vegetation	No change from existing conditions. Continued impacts to vegetation from testing and training activities at current locations and levels.	Minor to moderate impacts due to removal of vegetation for construction, use of new or expanded testing and training areas, and use of new impact areas.
Visual Resources	No change from existing conditions. Current testing and training activities would continue to have negligible to minor impacts to visual resources.	<p>Temporary minor impacts from construction-related airborne dust.</p> <p>Recurring temporary minor impacts from dust and other obscurants caused by testing and training.</p> <p>Potential long-term minor impacts from increased use of lighter-than-air UASs.</p> <p>Potential minor long-term impacts from appearance of new buildings.</p>
Water Resources	Continued impacts from contaminants and water consumption due to testing and training activities at current locations and levels.	<p>Potential temporary minor adverse impacts to water quality resulting from sediment runoff during construction and an increase in impervious surfaces following construction, reduced with use of appropriate BMPs</p> <p>Minor to moderate increased potential for impacts to groundwater from degradation of munitions.</p> <p>Minor potential for offsite impacts due to transport of contaminants and sediments generated from stormwater runoff on new or expanded testing and training areas.</p> <p>Potential negligible reduction in groundwater recharge rates due to new impervious area.</p>
Wildlife and Fisheries	No change from existing conditions. Minor impacts to wildlife would continue under current levels of testing and training activities at current locations.	<p>Minor short-term impact from incidental mortality, displacement, and disturbance due to construction.</p> <p>Potential for minor to moderate long-term impacts from incidental mortality, displacement, and disturbance due to creation and use of new or expanded testing and training areas.</p> <p>Minor to moderate long-term indirect impacts from loss of habitat due to construction, UAS launch/recovery areas, utilities, and TGPs and only minor impacts from disturbance of habitat due to use of DZs.</p>

Any activities and projects selected for implementation following analysis in this FPEIS will require additional evaluation and processing prior to implementation. Specific project proponents must submit a work order (DA 4283) or service order and other required documents, such as a dig permit, for approval by YPG Environmental Services Division for the proposed project. Further, a specific proposed project may require Real Property Planning Board approval, additional NEPA review (as determined by this analysis), NHPA Section 106 consultation, or environmental permit applications, and state or federal

regulatory agency approvals prior to implementation. These approvals may result in additional mitigation measures being required for specific projects.

3.22.1 Cumulative Effects Summary

Table 3-20 summarizes the potential cumulative impacts for each resource area. This section summarizes the potential for cumulative impacts for the resource areas identified in the table as having the potential for cumulative impacts; those with no potential for cumulative impacts are not discussed further.

There are 10 projects implemented on YPG in the past 7 years that could contribute to cumulative impacts to resources. These projects are discussed in the following NEPA documents:

- Final Environmental Assessment for the Unmanned Aircraft Systems Test Center. Jason Associates Corporation. January 2008. (Jason Associates Corporation, 2008a)
- Final Environmental Assessment for the Proposed Cobra Flats, Comanche Flats, and Site 2 Military Training Areas. Jason Associates Corporation. January 2008. (Jason Associates Corporation, 2008b)
- Final Environmental Assessment for the Army Test Tracks. Prepared for U.S. Army Garrison Yuma Proving Ground. Jason Associates Corporation. March 2008 (Jason Associates Corporation, 2008c)
- Environmental Assessment for Improvised Explosive Devices (IED) Test Environment. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground (YPG Directorate of Public Works). January 2010. (YPG DPW, 2010a)
- Environmental Assessment for Impact Areas Expansion. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. March 2010. (YPG DPW, 2010b)
- Environmental Assessment for Cibola Impact Areas. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. April 2011. (Gutierrez Canales Engineering, P.C., 2011)
- Environmental Assessment for Fuel Facilities Optimization. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. November 2011. (YPG DPW, 2011a)
- Environmental Assessment for Persistent Surveillance Systems Program. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. December 2011. (YPG DPW, 2011b)
- Environmental Assessment for Long Range Munitions. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. April 2013. (YPG DPW, 2013a)
- Environmental Assessment for Military Training Area Expansion. Environmental Sciences Division, Directorate of Public Works, U.S. Army Garrison Yuma Proving Ground. May 2013. (YPG DPW, 2013b)

Each of these projects was subjected to specific NEPA evaluation and the analyses included assessment of the potential for cumulative impacts to affected resources. The cumulative impacts analyses presented in these NEPA documents are incorporated into this FPEIS by reference and are not further discussed.

YPG has begun investigating the development of a solar renewable energy resource on the installation to increase YPG's energy security and meet federal mandates and legislative requirements to increase production and consumption of renewable energy resources. This development would be through an EUL with a private company. Solar technologies under consideration by the Army include solar PV, Dish Stirling, and dry-cooled concentrating solar thermal technologies. Multiple locations are under consideration in the Cibola and Kofa Regions. The size of a solar development on YPG lands has not been determined, and the sites under consideration range from several hundred acres to several thousand acres (B&V, 2011; USAEC, 2012). An EUL for solar power generation is not a component of the Proposed Action, and specific NEPA analysis would be conducted for any such project. The potential for cumulative impacts from development and operation of a solar power generation facility was considered in the assessment of potential cumulative impacts in this analysis.

Construction, operation, and maintenance of such a facility could contribute to cumulative impacts to air quality, cultural resources, energy and utilities, hazardous materials, land use, recreation, socioeconomics, soils, TES species, traffic/transportation, vegetation, visual resources, surface water and groundwater resources, and wildlife.

The Quartzsite Solar Energy Project would construct, operate, maintain, and decommission a 100-MW commercial solar thermal generation power plant using dry-cooling technology with a 1.5-mile generator tie-line, switchyard and access road over approximately 1,675 ac about 10 miles north of Quartzsite, Arizona in La Paz County. The Quartzsite Solar Energy Project, which is scheduled for operation in 2015, would have the potential to contribute to cumulative impacts to air quality, cultural resources, energy and utilities, hazardous materials, health and safety, land use, noise, recreation, socioeconomics, soils, TES species, traffic/transportation, vegetation, visual resources, water resources, and wildlife. A discussion of each resource area with potential impacts follows Table 3-20 and contains additional details regarding the nature of the impacts. There are no cumulative impacts predicted for the following resource areas: airspace management, environmental justice and protection of children, and geological resources.

There are five other proposed solar projects within approximately 10 miles of YPG that are associated with BLM. The Palomas project is proposed to be a concentrated solar power trough and would be located east of YPG adjacent to the Aqua-Caliente solar project. The LaPosa Solar Terminal and Quartzsite project are proposed to be a concentrated solar power trough and would be located along I-95 between Cibola and the Kofa NWR. The Windcat Quartzsite project is proposed as concentrated solar power tower and would be located along I-95 between Cibola and the Kofa NWR. At this time, project-specific details are unknown. However, these solar projects have the potential to contribute to cumulative impacts to air quality, cultural resources, energy and utilities, hazardous materials, health and safety, land use, noise, recreation, socioeconomics, soils, TES species, traffic/transportation, vegetation, visual resources, water resources, and wildlife. There are no cumulative impacts predicted for the following resource areas: airspace management, environmental justice and protection of children, and geological resources.

TABLE 3-20
Summary of Cumulative Effects
Yuma Proving Ground

Resource Area	Potential Cumulative Impacts
Air Quality	Potential for minor incremental contributions to combustion emissions and dust generation from Proposed Action. Potential for net minor benefits from reduced reliance on fossil fuels for electrical energy production with development of renewable solar electric generation projects.
Airspace Management	None
Cultural Resources	Unknown; there are areas not previously surveyed for cultural resources which would be evaluated on a project-specific basis in the future. Potential for minor cumulative impacts with development of the Quartzsite Solar Energy Project and the five additional BLM solar projects.
Energy/Utilities	Beneficial impacts from reduction in use of generators and fossil fuels. Minor incremental contribution to benefits to wastewater treatment. Potential for minor beneficial impacts to energy/utilities from development of renewable solar electric generation facilities in the region.
Environmental Justice and Protection of Children	None
Fire Management	Potential for cumulative impacts relative to fuel loading and potential spread of wildfires from increased potential for establishment and growth of exotic invasive plant species in areas disturbed but not converted to impervious surface. Potential for incremental increase in ignition of wildfires from live fire activities resulting from the Proposed Action.
Geological Resources	None
Hazardous Materials/Hazardous Waste	Potential for cumulative impact from increased hazardous material use and disposal resulting from use of new or expanded testing and training areas under the Proposed Action. Contribution from YPG would be minor. Potential for moderate cumulative impacts from heat transfer liquids and brine during operation of renewable solar energy facilities.
Land Use	Potential for cumulative impacts from operational and testing use and development of a renewable solar electric generation facility, which would prevent military use of up to 1,000 ac. Contribution from military mission as a result of the Proposed Action would likely be minor. Potential for interaction with regional solar facilities for incremental impacts to regional land use from conversion to new uses.
Noise	Potential for cumulative impacts if aircraft traffic from Yuma Airport and MCAS Yuma increase in the future. Contribution from YPG would be minor.
Recreation	Potential for incremental cumulative impacts from operational use and development of a renewable solar electric generation facility as more land is made unavailable for recreational hunting. Potential for cumulative impacts to regional recreation from operational use and development of the Quartzsite Energy Project and the five additional BLM solar projects.
Safety	Beneficial impacts from transportation improvements on US 95.
Socioeconomics	Potential for minor beneficial cumulative impacts from development and operation of renewable solar electric generation facilities.

TABLE 3-20
Summary of Cumulative Effects
Yuma Proving Ground

Resource Area	Potential Cumulative Impacts
Soils	Moderate incremental impacts from loss of vegetation associated with TGPs and development of renewable solar electric generation facilities.
Threatened or Endangered Species and Species of Concern	Potential for minor incremental loss of suitable habitat, including potential habitat loss from development of the renewable solar electric generation facilities.
Traffic/Transportation	Minor beneficial impacts from improved traffic flow. Potential for minor temporary cumulative impacts from increased traffic during construction of the renewable solar electric generation facilities.
Vegetation	Moderate incremental loss of vegetation and habitat, including potential habitat loss from the development of renewable solar electric generation facilities.
Visual Resources	Minor incremental increase in lighter-than-air UAS testing could contribute to cumulative impact to visual resources in some locations. Potential for minor cumulative impacts to visual resources from development of a renewable solar electric generation facility and from development of the Quartzsite Energy Project and the five additional BLM solar projects.
Water Resources	Potential minor incremental cumulative impacts to water resources from Proposed Action. Potential for minor to moderate cumulative impacts to water resources from development and operation of renewable solar electric generation facilities.
Wildlife and Fisheries	Moderate incremental loss of habitat, including potential habitat loss from development of the renewable solar electric generation facilities.

3.22.1.1 Air Quality

Most air quality impacts would be minor and temporary. There would long-term incremental additions of dust from use of new or expanded testing and training areas resulting from vehicle operation, munitions firing, and other activities. Development of a commercial-scale renewable solar electrical energy generation facility could generate fugitive dust. Appropriate BMPs, described in Section 3.2.2.3, would be implemented to minimize dust generation, as appropriate. There would be slight increases to the current levels of dust generated by testing and training activities. There also would be minor long-term increases in combustion engine emissions from increased vehicle use, but, as noted above, these would not be expected to result in exceedances of air quality standards. Development of commercial-scale renewable solar electrical energy generation facilities would result in long-term beneficial impacts to air quality through reduced fossil fuel emissions associated with other electrical generation methods; however, the use of fossil fuels to produce demineralized water to wash mirrors and to transport that demineralized water to the facility would partially offset any benefits. Any contribution to cumulative impacts would be expected to be minor.

The Quartzsite Solar Energy Project would remain below all major source thresholds and any contribution to cumulative impacts would be expected to be minor.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to air quality during construction as a result of emissions

from operation of construction equipment and personal vehicles and from the generation of fugitive dust. It is expected that BLM will require that construction contractors implement appropriate BMPs and equipment maintenance procedures to minimize this potential. Once operational, these facilities could contribute to beneficial impacts to regional air quality through a reduction in use of fossil fuels to generate electricity.

3.22.1.2 Cultural Resources

Activities that have been sited in areas that were surveyed and assessed for cultural resources and that have complete SHPO consultation with a determination that no significant cultural resources occur would not affect cultural resources and would have no potential for cumulative impacts to cultural resources. Implementation of the proposed activities may affect historic properties at YPG. Development of a commercial-scale renewable solar electrical energy generation facility could impact cultural resources and any such impacts could interact with other activities that impact cultural resources to produce cumulative effects. YPG is developing a PA in consultation with SHPO, ACHP, and interested tribes that will identify means to avoid, minimize, and mitigate potential effects.

Regional solar energy projects were considered in addition to proposed activities on YPG. The Quartzsite Solar Energy Project contains one cultural property that is recommended for inclusion in the NRHP that could be affected; impacts would be mitigated through avoidance and construction monitoring. Any contribution to cumulative impacts to cultural resources from the Quartzsite Solar Energy Project would be expected to be minor.

Construction, operation, and maintenance of the additional BLM solar projects could contribute to cumulative impacts to regional cultural resources. At this time cultural resources in the project areas are unknown and the potential for cumulative impacts to this resource area cannot be assessed accurately. However, it is expected that BLM will require that these projects conduct appropriate investigations and consultation with SHPO regarding cultural resources to ensure that these resources are not negatively impacted or to develop and implement appropriate mitigation for unavoidable impacts that would Reduce impacts to less than significant and minimize the potential for cumulative impacts.

3.22.1.3 Energy/Utilities

Replacement of portable generators with grid-supplied power would reduce demand and would be a moderate benefit to energy consumption in the region. A long-term cumulative benefit to air quality would be expected from this action due to the reduction in emissions.

The reduction in portable generator use would reduce the need to transport fuel for operation of generators to the areas receiving hard power and telecommunications service, which would reduce the use of vehicles to transport fuel, leading to reductions in fuel consumption and air emissions. The elimination of transporting fuel to these sites would indirectly benefit regional energy use and provide beneficial cumulative impacts to air quality. In addition, there would be reduced potential for petroleum spills, either from transport accidents or from refueling. This would be an indirect beneficial impact with regard to hazardous material by reducing the potential for a release of petroleum products to the environment.

Operation of the WTP would reduce generation of solid waste associated with bottled water as well as reduce fuel consumption from the delivery of bottled water. This would be a minor cumulative benefit to waste generation and fuel consumption.

Should the Kofa cantonment wastewater treatment and sewer system be replaced, it would be a benefit to wastewater treatment. Any new sewer lines installed as a result of the Proposed Action would likely make minor contributions to cumulative benefits to wastewater treatment.

Development of a commercial-scale renewable solar electrical energy generation facility would result in beneficial cumulative impacts to energy and utilities by providing increased renewable energy sources in the region.

Several current or reasonably foreseeable energy projects are proposed in the YPG area and may result in cumulative impacts. The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County that will be operational in 2015. An additional solar power facility is also proposed at the former White Wing Ranch, but the size and location of the project are unknown at this time. Arizona Public Service proposes to construct a 500-kV transmission. There also are five additional proposed solar facilities on BLM land near YPG. These proposed projects would be expected to result in increased demand for water for construction, cleaning, and operation, which could cause cumulative impacts on water utilities from incremental increased consumption. In addition, these projects also would result in reduced demand for fossil fuels to generate electrical power, which would result in beneficial impacts to energy supply and usage in the region.

3.22.1.4 Fire Management

There would be potential for cumulative impacts relative to fuel loading and potential spread of wildfires from increased potential for establishment and growth of exotic invasive plant species in areas disturbed but not converted to impervious surface. There also would be potential for incremental increase in ignition of wildfires from live fire activities resulting from the Proposed Action. No additional projects were identified that would have potential to interact with fire management on YPG to create cumulative impacts.

3.22.1.5 Hazardous Materials/Hazardous Waste

Development of a commercial-scale renewable solar electrical energy generation facility could result in generation of hazardous materials.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to hazardous materials cumulative impacts. At this time details on hazardous materials in the project areas are unknown and the potential for cumulative impacts cannot be assessed accurately. However, it is expected that BLM will require that these projects implement appropriate use, storage, and disposal measures to minimize the potential for cumulative impacts.

The Quartzsite Solar Energy Project north of Quartzsite, Arizona in La Paz County could result in the generation of hazardous materials. No cumulative impacts to hazardous materials would be expected from construction of either solar facility. The facility will be dry-cooled (U.S. Department of Energy and BLM, 2013) and thermal cooling fluid and brine would be by-products of electrical power generation that would require disposal. Depending on the Therminol compound used, there could be a moderate potential for cumulative impacts to hazardous materials from use and disposal of Therminol heat transfer fluids during operation of a dry-cooled concentrating solar facility.

No other future projects with potential hazardous materials impacts are known at this time. Testing and training requirements are expected to continue to evolve over time. This could result in an increase in testing and training activities throughout YPG, which would have the potential for increased use of hazardous materials, an increase in the need for disposal of hazardous wastes, and the potential for exposure of existing subsurface contamination.

3.22.1.6 Land Use

Development of a commercial-scale renewable solar electrical energy generation facility could interact with land use on YPG. Up to 8,900 ac of Range/Open Land within YPG would be converted to industrial use and would no longer be available for meeting the military mission (B&V, 2011; USAEC, 2012). When combined with land use impacts from other projects on YPG, development of a renewable solar facility could result in minor cumulative impacts to land use on YPG.

While YPG actions would not directly interact with land use outside the installation boundary, the potential for incremental impacts to regional land use would exist. Construction, operation, and maintenance of the five additional BLM solar projects and the Quartzsite Solar Energy Project would cause land to be converted from open land into solar facilities, which would reduce available rangeland. The potential for these solar projects to contribute to regional land use cumulative impacts cannot be assessed accurately at this time, but there is a reasonable probability that implementation of these projects would contribute to regional land use impacts.

3.22.1.7 Noise

Predicted noise levels from the Proposed Action would not be expected to interact with noise outside of the YPG boundary. Noise from the Barry M. Goldwater Air Force Range and from MCAS Yuma is not expected to overlap noise from YPG. Noise contours from YPG activities are within the YPG boundary except for a small area north of the Kofa Range and east of the Cibola Range.

Should flights from MCAS Yuma or the Yuma Airport increase in the future, there would be potential for cumulative impacts to noise. Aircraft operations on YPG could incrementally add to the noise from MCAS Yuma and the airport. Because most aircraft operated on YPG are rotary wing aircraft or UAS, the incremental contribution to the noise environment would be less than that from commercial jet aircraft operating from the airport or military jet aircraft operating from MCAS Yuma. Any incremental contribution from aircraft noise resulting from the Proposed Action would be expected to be minor.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. There could be short-term noise impacts during construction, but the Project would not contribute to cumulative noise impacts because operational noise would be minimal.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to short-term noise impacts during construction, but the projects would likely not contribute to cumulative noise impacts because operational noise would be minimal.

3.22.1.8 Recreation

Development of a commercial-scale renewable solar electrical energy generation facility could affect recreational hunting and contribute to cumulative impacts to this resource.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. Approximately 1,675 ac would be converted from open land, which could cause indirect impacts to nearby recreational uses through alteration of the visual landscape. The Quartzsite Solar Energy Project could contribute to cumulative impacts to regional recreation.

Construction, operation, and maintenance of the five additional BLM solar projects would likely result in incremental loss of recreational opportunities on BLM lands as projects are implemented. In addition, the appearance of the solar facilities could be a negative experience for recreational users in the area. The combination of loss of usable land and degradation of the recreational experience through altered visual character could contribute to cumulative impacts to regional recreation.

3.22.1.9 Safety

There would be potential for foreseeable future projects to interact with safety on YPG. Should a commercial-scale solar-powered electrical generation facility be constructed in the Cibola Region within YPG, glare from such a facility could affect aircraft operations within YPG airspace, which could increase safety risks.

Proposed ADOT improvements to US 95 would provide increased traffic safety along this road for public travel and for YPG-related travel. This would be a cumulative benefit to safety in the region and would also occur under the No Action Alternative.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. There would be minimal health and safety risks during construction and operations of the project, and they would not contribute to regional safety cumulative impacts.

Construction, operation, and maintenance of the five additional BLM solar projects would be unlikely to contribute to regional safety cumulative impacts. There would be minimal health and safety risks during construction and operations of the project, and they would not contribute to regional safety cumulative impacts.

No other past, present, or reasonably foreseeable projects would have the potential to interact with safety on YPG. No other cumulative impacts are expected.

3.22.1.10 Socioeconomics

There could be minor cumulative beneficial impacts to socioeconomics from development and operation of a commercial-scale renewable solar electrical energy generation facility. There would be long-term creation of a few jobs, which would have a negligible beneficial impact on regional employment. Operation of this facility would reduce the demand for electricity from the grid for YPG, which could contribute to reduced rates paid for electricity and provide incremental benefits to the regional economy.

There could be minor cumulative beneficial impacts to regional socioeconomics from development and operation of the Quartzsite Solar Energy Project, approximately 10 miles north of Quartzsite, Arizona in La Paz County. There would be short-term creation of 280 jobs and long-term creation of 47 jobs, which would incrementally benefit regional employment. Operation of the facility would provide additional source of electrical power,

which could contribute to reduced rates paid for electricity and provide incremental benefits to the regional economy.

There could be minor cumulative beneficial impacts to regional socioeconomics from development and operation of the five additional BLM solar projects. There likely would be short-term and long-term job creation, which would incrementally benefit regional employment. Operation of the facilities would provide additional sources of electrical power, which could contribute to reduced rates paid for electricity and provide incremental benefits to the regional economy.

3.22.1.11 Soils

Impacts to soils from establishment of TGP's would be minor with implementation of BMP's and no regional cumulative impacts to soils beyond the boundary of YPG would be expected.

Development of a commercial-scale renewable solar electrical energy generation facility would result in soil disturbance on up to 8,900 ac (B&V, 2011; USAEC, 2012). This could incrementally add to other projects on YPG that create soils disturbance and lead to minor cumulative impacts to soils.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. Approximately 115 ac of the 1,675-ac project area would be completely cleared of vegetation. The project area is entirely within the Superstition-Rositas series, which exhibits a moderate to high susceptibility to water and wind erosion. Should the project be constructed, appropriate erosion control measures would be implemented. Any contribution to cumulative impacts to soils would be minor.

Construction, operation, and maintenance of the five additional BLM solar projects would likely contribute to regional cumulative impacts to soils. While specific impacts are unknown at this time, it is likely that a substantial acreage would be cleared for each project, increasing the susceptibility of the soils to wind and run-off erosion. It is likely that BLM will require appropriate BMP's to minimize the potential for erosion. Therefore, any contribution to cumulative impacts to soils would be expected to be minor.

3.22.1.12 Threatened or Endangered Species and Species of Concern

The cumulative effect of incremental vegetation and habitat loss within YPG from all proposed activities would be moderate. No significant incremental impacts to TES species from vegetation clearing or habitat loss would be expected. No significant impacts to TES species from relocation of water tanks would be anticipated. Past and reasonably foreseeable future activities also could interact with the effects of the Proposed Action concerning impacts to TES species. Development of a commercial-scale renewable solar electrical energy generation facility would result in loss of up to approximately 8,900 ac of desert habitat (B&V, 2011; USAEC, 2012), and could result in loss of land designated as primary desert tortoise habitat. This could contribute to cumulative impacts to Sonoran desert tortoise.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. Should the project be constructed, approximately 51.5 ac of moderately suitable habitat for

the Mojave fringe-toed lizard would be lost, but no other impacts to TES species or their habitats would result. There could be minor contributions to the cumulative impacts on TES species and their habitats.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to TES species and their habitats through land clearing and site preparation activities associated with construction. The magnitude of disturbance, the occurrence of particular TES species, and the occurrence of potentially suitable habitats for TES species within and near the proposed projects is not known at this time and the potential for cumulative impacts cannot be assessed accurately. However, it is likely that BLM will require appropriate coordination or consultation with USFWS and AZGFD with regard to the potential to impact TES species. Through this process and subsequent implementation of any conservation measures identified by the regulatory agencies, it is expected that any contribution to cumulative impacts to TES species and their habitats would be minimal.

Because all impacts to TES species resulting from the Proposed Action would be confined within the boundary of YPG and because there would be no loss of species, it is not expected that TES species impacts of the Proposed Action would interact with off-post actions to affect regional TES species populations.

3.22.1.13 Traffic/Transportation

Road improvements along US 95 are expected to reduce congestion and improve flow, resulting in beneficial cumulative impacts.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. If construction were to coincide with other construction projects in the area, there could be incremental increases in traffic that would create minor temporary cumulative impacts to regional traffic on US 95. The facility will be operational in 2015 and construction-related traffic impacts would end at that time. No potential for cumulative impacts to traffic would be expected from operation of the project.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to traffic/transportation. Two of the five projects are located along the US 95 corridor and there could be incremental increases in traffic that would create minor temporary cumulative impacts to regional traffic on US 95. Because of the interface with US 95, use appropriate traffic control procedures to minimize traffic impacts. However, even brief delays associated with construction traffic could incrementally interact with military traffic to create more substantial traffic impediments. However, any such incremental impacts would be temporary and would end when construction was complete.

3.22.1.14 Vegetation

YPG would establish 23 new TGPs in the Cibola Region. The magnitude of impact to vegetation would vary depending on testing needs and the type of vegetation at a proposed TGP. For each TGP, up to 2.2 ac of desert shrub vegetation would be cleared. No species loss would be expected from clearing for TGPs. If a TGP would be in an area of native vegetation, the impact could range from minor (limited woody vegetation) to moderate (area predominantly desert shrub vegetation). Because desert vegetation recovers slowly,

due to the harsh environment and the limited availability of water, any impacts from establishment of TGP's would be long-term.

There could be increased potential for invasion by herbaceous exotic invasive species as a result of clearing vegetation. The development and use of exotic invasive plant species control methods through continued implementation of the INRMP would minimize the potential for spread of the exotic invasive plants into disturbed areas. Clearing for TGP's could be beneficial if a selected TGP would be within an area dominated by exotic invasive vegetation. Clearing of such an area would be a minor benefit to desert vegetation. Impacts from vegetation clearing could reach approximately 125 ac across YPG within the timeframe for vegetative recovery of a given TGP site. This would constitute a minor cumulative impact to desert vegetation on YPG, but no regional cumulative impacts to vegetation beyond the boundary of YPG would be expected.

There are multiple locations within the Cibola and Kofa Region where new munitions impact areas would be established or where existing munitions impact areas would be expanded. Approximately 46,070 ac would be converted to munitions impact areas. Of this, approximately 45,820 ac would receive both inert and explosive fire and approximately 250 ac at JERC I, II, and III would be for inert fire only. There would be no direct impacts to vegetation in these areas from creation of the munitions impact areas. After munitions impact areas are established, there would be the potential for episodic disturbance to vegetation from munitions testing and operational testing or training activities that would fire into these areas. Munitions impact areas that receive only inert fire would be less impacted, as direct impacts to vegetation would be negligible. There would be potential for long-term indirect changes to vegetation as a result of altered growing conditions should inert munitions degrade and release metals or other constituents of concern to the soil.

Development of a commercial-scale renewable solar electrical energy generation facility would result in vegetation clearing on up to approximately 8,900 ac (B&V, 2011; USAEC, 2012). This could incrementally add to other projects on YPG that remove vegetation and lead to minor cumulative impacts to vegetation.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. Approximately 115 ac of the 1,675-ac project area would be completely cleared of vegetation and it is likely that there would be additional vegetation loss during construction. No loss of species or habitat types would be expected, and it is anticipated that any contribution to cumulative impacts to vegetation would be insignificant.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to vegetation. While specific impacts are unknown at this time, it is likely that a substantial acreage would be cleared of native vegetation for each project. It is likely that BLM will require appropriate measures, possibly including modifications to site designs to prevent loss of any vegetation type or species from the region. Therefore, any contribution to cumulative impacts to vegetation would be expected to be minor.

The cumulative effect of incremental loss of vegetation from clearing within YPG from all proposed activities would be moderate. Past and reasonably foreseeable future activities also could interact with the effects of the Proposed Action concerning impacts to vegetation.

Because all impacts to vegetation resulting from the Proposed Action would be confined within the boundary of YPG and because there would be no loss of species or specific habitat types, it is not expected that vegetation impacts of the Proposed Action would interact with off-post actions to affect regional vegetation.

3.22.1.15 Visual Resources

Under the Proposed Action, there would be an increase in use of lighter-than-air UASs and the size of these craft also may increase. It is likely that multiple lighter-than-air UAS would be deployed simultaneously across the installation if testing needs warrant. The incremental increase in lighter-than-air UAS testing could be considered a minor negative cumulative impact.

Development of a commercial-scale renewable solar electrical energy generation facility would change the visual characteristics of the area and could contribute to cumulative impacts to visual resources in the region.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. The 1,675-ac project area would change the visual characteristics of the area and incrementally contribute to cumulative impacts to visual resources.

Construction, operation, and maintenance of the five additional BLM solar projects could change the visual characteristics of the area and incrementally contribute to cumulative impacts to visual resources and would create a negative viewing experience for some observers.

3.22.1.16 Water Resources

YPG would establish 23 new TGP in the Cibola Region. New TGP would not be placed in washes, so no direct impacts to water resources would result. Each TGP would cover an area of up to 2.2 ac, which would be cleared of woody vegetation. Minor soil disturbance could occur and there would be increased potential for erosion. The potential for indirect impacts to water resources would vary depending on testing needs and the type of vegetation at a proposed TGP. Impacts could range from minor (limited exposed soils from vegetation clearing and not in proximity to a wash) to moderate (extensive soil exposure and in proximity to a wash). Impacts from vegetation clearing could reach approximately 125 ac across YPG within the timeframe for vegetative recovery of a given TGP site. This would create the potential for minor cumulative impacts to surface waters on YPG, but no regional cumulative impacts to surface waters beyond the boundary of YPG would be expected.

Because potential direct effects to water resources would be confined within the boundaries of YPG and because BMPs and design features would minimize the potential for indirect impacts to offsite waters, there is little potential for interaction of the Proposed Action with other past, present, and reasonably foreseeable projects. As discussed above, no cumulative impacts would be expected on YPG.

Incremental impacts to water quality and groundwater depletion would be the potential routes of interaction with past, present, and reasonably foreseeable off-post actions. Because activities under the Proposed Action would not affect water quality, no cumulative impacts to water quality would be expected as a result of implementation of the Proposed Action. Consumptive use of groundwater would occur under the Proposed Action, but the

anticipated use would be small relative to the aquifer capacity. It is expected that minor cumulative impacts to groundwater would result in conjunction with other actions that also consumptively use groundwater.

Development of a commercial-scale renewable solar electrical energy generation facility would create new impervious surface area over much of an up to approximately 8,900-ac site (B&V, 2011; USAEC, 2012). Depending on post-construction stormwater controls that would be implemented with development of the facility, there could be increased stormwater runoff from the facility that could contribute to cumulative impacts to surface water and groundwater resources. Operation of the solar facility would result in consumptive use of water. The amount of operational water depends on the technology chosen during the separate NEPA analysis. However, there would be potential for cumulative impacts to groundwater from long-term consumptive use. The potential for cumulative impacts to water resources would be moderate.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County. The facility will be dry-cooled, would require over 1,150 acre-feet of water for construction of the facility, and would require 200 acre-feet of water annually for operation (U.S. Department of Energy and BLM, 2013). Water for the Quartzsite facility would be obtained from the regional aquifers or from the Colorado River. If groundwater is the source, there would be potential for cumulative impacts to groundwater from long-term consumptive use. If water is obtained from the Colorado River, there would be potential for cumulative impacts to surface water from long-term consumptive use. The potential for cumulative impacts to water resources would be minor.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to water resources. Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to water resources. These proposed projects would be expected to result in increased demand for water for construction, cleaning, and operation, which could cause cumulative impacts on regional water resources from incremental increased consumption.

3.22.1.17 Wildlife and Fisheries

The cumulative effect of incremental habitat loss within YPG from all proposed activities would be moderate. No significant incremental impacts to wildlife from this habitat loss would be expected. No significant impacts to wildlife from relocation of water tanks would be anticipated. Past and reasonably foreseeable future activities also could interact with the effects of the Proposed Action concerning impacts to wildlife. Because all impacts to wildlife resulting from the Proposed Action would be confined within the boundary of YPG and because there would be no loss of species, it is not expected that wildlife impacts of the Proposed Action would interact with off-post actions to affect regional wildlife populations.

Development of a commercial-scale renewable solar electric generation facility could result in removal of up to approximately 8,900 ac of desert scrub habitat. There likely would be minor to moderate incremental cumulative impacts to wildlife species that utilize this habitat when this loss is combined with other projects on YPG that would remove desert scrub habitat.

The Quartzsite Solar Energy Project would construct a 100-MW solar-powered electrical generation facility approximately 10 miles north of Quartzsite, Arizona in La Paz County.

This project would result in the loss of up to 1,675 ac of wildlife habitat. However, it is not anticipated this would contribute to regional cumulative impacts to wildlife populations.

Construction, operation, and maintenance of the five additional BLM solar projects could contribute to cumulative impacts to wildlife and fisheries. While specific impacts are unknown at this time, it is likely that a substantial acreage would be cleared of native vegetation for each project, which would reduce available habitat for native wildlife and likely would contribute to individual mortality for some species. It is likely that BLM will require appropriate measures, possibly including modifications to site designs to prevent loss of any habitat type or species from the region. Therefore, any contribution to cumulative impacts to wildlife and fisheries would be expected to be minor.

3.22.2 Mitigation Summary

Table 3-21 summarizes the proposed mitigation measures for resource areas with the potential for significant impacts from the Proposed Action. Avoidance of resources would be considered as the primary mitigation measure, but it would not be possible to avoid all resources for all proposed activities. The table shows potential mitigation measures, including implementation of BMPs, in the event avoidance is not practicable.

TABLE 3-21
Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
Air Quality	Yes, for activities in non-attainment area	Implement BMPs during construction to reduce fugitive dust emissions. Yuma would revise the Title V permit as needed to align with ADEQ regulations and Title V permit monitoring, recordkeeping, and reporting requirements.	3.2.2.4
Airspace Management	No	Continue coordination with MCAS Yuma and private/commercial air traffic controllers.	3.3.2.3
Cultural Resources	Yes	Implement Integrated Cultural Resources Management Plan (ICRMP) procedures; avoid or protect significant sites; monitor protection measures; implement data recovery; coordinate/consult with SHPO and Native American tribes, as appropriate, and implement any required mitigation from SHPO consultation. Environmental Awareness Training for persons working in areas where paleobotanical resources occur. Follow stipulations of executed PA.	3.4.8 3.4.2
Energy/Utilities	No	Incorporate energy-efficient design into new buildings. Use solar lights where practicable. Recycle/reuse to the extent practicable. Install hard power to additional locations to reduce reliance on diesel-powered generators at testing and training locations. Recycle and reuse to the extent practicable.	3.5.2.4

TABLE 3-21
 Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
Environmental Justice and Protection of Children	No	None	3.6.2.3
Fire Management	Yes	<p>Develop and implement a program to monitor invasive plants; continue to implement ITAM; coordinate with BLM, Kofa NWR, and U.S. Forest Service (USFS) on fire management; develop and interpret wildfire data with other agencies.</p> <p>Use GIS fire risk model to identify areas of high fire risk and incorporate into range operations as practicable.</p> <p>Implement Terms and Conditions 1a, 2a, 2b, and 3a from the USFWS BO of September 9, 2014.</p>	3.7.2.4
Geological Resources	No	None	3.8.2.3
Hazardous Materials/Hazardous Waste	Yes	<p>Continue management of hazardous materials; consult with state and federal agencies; manage and dispose of hazardous materials and wastes in compliance with applicable laws, regulations, and guidance; follow standard protective measures and procedures. Update, as necessary and implement SPCCP. Require non-ozone-depleting chemicals as refrigerants in new air conditioning systems.</p> <p>Continue to conduct regular range assessments to determine the potential for migration of MCOCs and implement appropriate measures to protect human health.</p>	3.9.2.4
Land Use	Yes	Continue coordination with local plans to avoid incompatibilities, as appropriate.	3.10.2.4

TABLE 3-21
Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
Noise	Yes	<p>Require construction workers to use appropriate hearing protection.</p> <p>Maintain aircraft operations in compliance with established Installation Compatible Use Zones (ICUZs).</p> <p>Locate noise-generating activities away from sensitive noise receptors and use natural barriers where practicable.</p> <p>Conduct noise-intensive activities during favorable weather conditions where practicable.</p> <p>Use lower noise products where practicable.</p> <p>Continue noise complaint management procedure and implement fly-neighborly programs.</p> <p>Adjust timing of disruptive activities and inform the public of unusual increases in intensity of testing and training.</p>	3.11.2.4
Recreation	No	None	3.12.2.4
Safety	Yes	<p>Minimize potential risks and exposure; require contractors to follow Occupational Safety and Health Administration (OSHA) standards; comply with YPG safety program and specific safety protocols for testing and training activities.</p> <p>Use GIS fire risk model to identify areas of high fire risk and incorporate into range operations as practicable. Verify there are no people in the portion of an SDZ extending into the Kofa NWR, primarily by visual or electronic means. Helicopters will be used to locate people only where large portions of an SDZ overlap Kofa NWR, primarily in R-2307.</p>	3.13.2.4
Socioeconomics	No	None	3.14.2.4
Soils	Yes	Avoid highly erodible soils; minimize soil disturbance to the extent practicable; implement construction BMPs and stormwater controls; continue to implement ITAM program and Integrated Natural Resources Management Plan (INRMP).	3.15.2.5
Threatened or Endangered Species and Species of Concern	Yes	<p>Avoid known sensitive habitats during siting process. Avoid impacts to water sources; schedule construction projects to avoid or minimize conflicts with reproduction; avoid implementing activities in areas where sensitive species occur to the extent practicable; relocate or deter species to minimize impacts if necessary; implement INRMP procedures. Limit surface-disturbing activities to the smallest area practicable.</p> <p>Avoid vegetation where feasible.</p> <p>YPG will continue to incorporate those</p>	3.16.2.4

TABLE 3-21
Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
		<p>portions of the <i>Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat</i> (Arizona Interagency Desert Tortoise Team, 2008 Appendix I) that are consistent with the military mission into management of this species and will consider these guidelines to develop appropriate mitigation strategies when evaluating activities. Should the Sonoran desert tortoise be listed under the ESA, then activities proposed in areas where the tortoise may occur on YPG would be re-evaluated with regard to potential impacts and appropriate consultation with the USFWS would be conducted.</p> <p>YPG will comply with the Reasonable and Prudent Measures with implementing Terms and Conditions of the USFWS BO regarding activities that may affect the Sonoran pronghorn on Kofa NWR:</p> <ul style="list-style-type: none"> To comply with Reasonable and Prudent Measure Number 1: YPG shall monitor environmental conditions on the Kofa Range, including weather patterns (e.g., temperature, precipitation, humidity) and status of fuels (e.g., distribution and density of annual vegetation or any other vegetation that is capable of carrying fire across the landscape). To comply with Reasonable and Prudent Measure Number 2: YPG shall continue to maintain a fire department with wildland firefighting capabilities. YPG shall continue to maintain a fire station at Kofa to provide rapid response on the Kofa Range in the event of fire. Should YPG detect exceptional fuel conditions that are conducive to carrying fire, then YPG shall increase fire readiness by (1) providing additional fire briefings to test officers to stress the importance of initial fire spotting and early notification and (2) considering maintenance of fire break infrastructure as funding and military mission permit. To comply with Reasonable and Prudent Measure Number 3: YPG shall report any fires that occur in the King Valley of Kofa NWR as a result of activities carried out or authorized by YPG to USFWS-AESO and Kofa NWR as soon as possible. The report (can be 	

TABLE 3-21
 Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
		<p>in the form of an email) will, at a minimum, include the date(s), acreage, and location(s) of the fire(s), as well as the number of pronghorn in the vicinity of the fire, if known. YPG shall also immediately notify Kofa NWR once aware that a fire has encroached or may encroach onto the refuge</p> <p>Conservation measures that are included in the Proposed Action that would be implemented by YPG include:</p> <ul style="list-style-type: none"> • Implement the 2014 Final Incident Response Protocol for Sonoran Pronghorn, which includes: (a) notifying USFWS and other appropriate parties as outlined in the protocol as soon as possible if Sonoran pronghorn are observed on YPG that are injured, sick, or dead; and (b) coordinating range access for USFWS and AZGFD as appropriate for capture of sick or injured pronghorn as well as recovery of dead individuals if necessary. Coordination will involve adherence to range safety and security procedures. • Avoid placing activities in proximity to artificial water sources (suitable for Sonoran pronghorn) to the extent that such action is consistent with the military mission. • YPG will adhere to the terms of the MOU between the Kofa NWR, Imperial NWR, BLM, and YPG, which provides procedures and guidance for cooperation and collaboration on wildland fire issues. This includes notifying interagency dispatch of any wildfire on YPG lands. <p>Should the experimental Sonoran pronghorn population in the Kofa NWR be reclassified under the ESA, then activities proposed in areas where the pronghorn may occur on YPG would be re-evaluated with regard to potential impacts and appropriate consultation with the USFWS would be conducted.</p>	
Traffic/Transportation	Yes	Implement traffic control procedures as appropriate; minimize construction activities during peak traffic periods on YPG.	3.17.2.3
Vegetation	Yes	Develop and implement a program to monitor invasive plants; continue to implement ITAM and INRMP; implement appropriate construction BMPs and stormwater controls.	3.18.2.4

TABLE 3-21
Summary of Potential Mitigation Measures for Each Resource Area
Yuma Proving Ground

Resource Area	Potentially Significant Impact	Potential Mitigation Measures	Document Section
		Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.	
Visual Resources	Yes	Apply appropriate dust suppression practices; design buildings to blend with existing structures; continue implementation of the Environmental Awareness program.	3.19.2.4
Water Resources	Yes	Develop and implement Construction SWPPPs to reduce potential for environmental exposure to pollutants in stormwater. Implement appropriate construction BMPs and stormwater controls; design to maximize use of pervious and semi-pervious surfaces; continue to implement INRMP; implement any mitigation required in Section 404 permits obtained.	3.20.2.4
Wildlife and Fisheries	Yes	Avoid wildlife concentration areas and sensitive habitats (e.g. water sources); schedule construction projects to avoid or minimize conflicts with reproduction; continue to implement INRMP. Limit surface-disturbing activities to the smallest area practicable. Avoid vegetation where feasible.	3.21.2.4

Notes:

Information provided is summarized from the analysis provided for each resource area elsewhere in Section 3. Mitigation measures identified would be implemented, as appropriate, for each specific activity undertaken. Only those measures appropriate for a given action would be implemented.

A discussion of each resource area follows the table and contains additional details regarding potential mitigation measures and the conditions under which each may be appropriate. There are no significant impacts, and thus no mitigation, for the following resource areas: airspace management, energy/utilities, environmental justice and protection of children, geological resources, recreation, and socioeconomics. Summaries of the proposed mitigation measures for these resource areas are not included. This document presents a programmatic approach to impact analysis. For some resource areas, additional analysis may be required to assess impacts from specific activities and additional mitigation measures may be developed.

3.22.2.1 Air Quality

Mitigation measures would reduce fugitive dust emissions during construction. Measures to reduce or eliminate fugitive dust emissions would include the use of BMPs during construction.

3.22.2.2 Airspace Management

To reduce impacts and conflicts with airspace management, YPG would continue to coordinate with MCAS Yuma and private and commercial air traffic controllers.

3.22.2.3 Cultural Resources

The YPG ICRMP explains how YPG can mitigate impacts to significant historic properties through avoidance, physical protection, data recovery, or other mitigation measures. As there are currently no NRHP eligible structures on YPG, there is no discussion of mitigation measures for historic structures.

The following are treatment plans for the protection and mitigation of prehistoric, historic archaeological sites, and paleobotanical resources: avoidance of areas with known significant sites; physical protection of individual sites through fencing, berming, or other protective measures to make the sites inaccessible; and monitoring the effectiveness of the protection measures

U.S. Army Garrison has determined that implementation of projects in this FPEIS would affect historic properties at YPG. A PA is being developed, in consultation with SHPO, ACHP, and interested tribes, that will identify means to avoid, minimize, and mitigate the potential effects.

Through the planning process for the Proposed Action, activities were sited to avoid known archaeological and paleobotanical resources to the extent practicable in order to minimize impacts to significant cultural resources. For areas proposed for activities where previous cultural resource surveys have not been conducted, measures may include surveys, tribal consultation, compliance with stipulations in the Section 106 PA, and activity-specific NEPA analysis.

Environmental Awareness Training for cultural resources would be implemented for persons working or training on YPG. This training would explain the importance of archaeological and paleobotanical resources and the protection of these resources on YPG

3.22.2.4 Energy/Utilities

To mitigate and reduce the energy demand of the Proposed Action YPG would incorporate energy-efficient design into new buildings and use solar lights where practicable.

3.22.2.5 Fire Management

Mitigation measures would reduce the potential for fires and improve fire management. YPG is developing a program to monitor and manage all invasive plants on YPG. YPG would continue to implement ITAM and restore disturbed areas to natural conditions when practicable to prevent the spread of exotic invasive species. YPG would continue to coordinate with BLM, the Kofa NWR, and the USFS on fire management strategies and to develop and interpret wildfire data. To the extent allowed within safety constraints from UXO, efforts to control and manage wildfires on YPG would be implemented.

3.22.2.6 Hazardous Materials/Hazardous Waste

Mitigation of the potential impacts from the Proposed Action includes the continued management of hazardous materials using existing environmental programs and guidance to manage the handling and disposal of hazardous materials and waste in compliance with applicable laws and regulations. If new facilities would be sited in previously contaminated sites, appropriate protective measures would be implemented to safeguard construction workers. If contaminated soil is encountered during construction, it would be removed and properly disposed of in accordance with appropriate regulations. Appropriate protective

procedures would be implemented when renovation or demolition of existing buildings would result in potential exposure to ACM.

Range assessments would continue to be conducted to determine the potential for migration of MCOCs from ranges. YPG would implement appropriate measures should off-range migration that could affect human health or the environment be indicated.

In the event that munitions and explosives of concern are discovered in areas of proposed construction, they would not be disturbed until qualified personnel could properly assess and implement appropriate disposition. As required, the Army would consult with the appropriate state and federal agencies.

3.22.2.7 Land Use

YPG would continue coordination and participation in local plans and development meetings to ensure that encroachment and land use incompatibilities from adjacent lands are avoided.

3.22.2.8 Noise

Measures to prevent land use incompatibilities with adjacent lands, including impacts from noise, would include physical and procedural measures. Physical mitigation measures would include:

- Locating or relocating ranges relative to natural barriers such as valleys and mountains
- Constructing berms or barriers around small caliber ranges
- Orienting noise sources toward the interior of the installation and away from sensitive receptors

Procedural mitigation measures would include:

- Participating actively in local and regional planning, including use of GIS and noise contours
- Conducting noise-intensive activities under favorable weather conditions that minimize noise transfer
- Maintaining aircraft operations in compliance with established ICUZ
- Implementing fly-neighborly programs
- Adjusting the timing of particularly disruptive activities where feasible
- Informing the public of any unusual increases in intensity of testing and training activities or of activities to be resumed after a period of inactivity
- Reviewing EAs and EISs
- Monitoring noise on the ground when appropriate
- Implementing noise complaint management procedures

To minimize human exposure, safety zones and hazardous noise areas would be established as needed and would include the use of noise level meters and warning signs.

3.22.2.9 Safety

YPG would implement mitigation measures to minimize the potential adverse impacts to safety from construction and active munitions areas. During construction, workers would follow appropriate OSHA regulations and on-post personnel would comply with the YPG safety program. Each testing and training activity would have a specific safety protocol that would be followed.

3.22.2.10 Soils

Mitigation measures, including measures implemented to avoid impacts, would address the potential for increased erosion from either wind or water. All disturbed soils would have a greater potential for erosion because the soils would be directly exposed to the effects of precipitation and wind. Mitigation measures would include:

- Planning, site selection, and site design to avoid disturbance of highly erodible soils
- Implementation of construction BMPs to minimize the potential for onsite erosion (for example, preserving existing vegetation, mulching, slope protection, silt fencing, wet suppression and chemical dust suppression)
- Construction and post-construction stormwater controls (for example, site design, temporary detention areas, mulching, use of pervious and semi-pervious surfaces)
- Continued implementation of the ITAM program and the INRMP.

3.22.2.11 Threatened or Endangered Species and Species of Concern

By avoiding known TES species locations and water sources, YPG would minimize the potential for impacts to TES species. When implementing construction projects in areas where TES animal species are likely to nest or den, YPG would schedule construction to occur outside the nesting or denning period where practicable.

Surveys would be conducted to minimize the potential for impacts from activities proposed within or adjacent to high quality TES species habitat, as necessary. If TES species are found in the proposed activity areas, YPG would determine whether the proposed activity could be relocated. If relocation of the activity is not practicable, YPG would relocate TES species to nearby suitable habitat if practicable. If proposed activities could not be scheduled outside the nesting/ denning periods for TES species, work could be delayed until after young had fledged or departed the area when practicable or the nest could be sheltered in place using the appropriate protocols through coordination with AZGFD.

Where vegetation clearing might occur in or adjacent to suitable habitat for the banded Gila monster or Sonoran desert tortoise, simple barriers such as silt fencing would be placed to deter entry by these species.

YPG implements those portions of the Arizona Interagency Desert Tortoise Team *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (Appendix I) that are consistent with the military mission. Should the Sonoran desert tortoise be listed as threatened or endangered under the ESA, either additional coordination or ESA Section 7 consultation with USFWS would occur prior to any land-disturbing activities in areas where Sonoran desert tortoise are known to occur on YPG. Depending on the activity, either a Biological Assessment or Biological Evaluation would be prepared to support consultation.

To minimize the potential for impacts to TES species YPG would limit surface-disturbing activities to the smallest area practicable and would avoid vegetation where feasible.

YPG will consult with USFWS on any proposed activities that may affect the Sonoran pronghorn on the Kofa NWR.

The INRMP directs the management of natural resources, including TES species within YPG. Through continued implementation of the INRMP, YPG utilizes the best available scientific knowledge and techniques to manage its resources. Measures that would be implemented to avoid or minimize impacts to soils, vegetation, and water resources would provide indirect benefits to wildlife through improved habitat conditions.

3.22.2.12 Traffic/Transportation

YPG would implement mitigation to minimize the potential adverse impacts to traffic from temporary road closures. During road closures, traffic control procedures would be implemented such as flaggers or posted detours. During construction of the Aberdeen Road flood upgrades, appropriate traffic control measures would be implemented to minimize the disruption of traffic flow, and may include detours, timing construction to avoid peak traffic volume times, and flaggers.

3.22.2.13 Vegetation

Construction and post-construction stormwater controls would be implemented to facilitate infiltration and reduce the potential for scour. Depending on the location of the new impervious areas, the potential loss of vegetation through scour from erosive water flow could extend off-post and affect vegetation on adjacent downstream properties. During construction, BMPs would be used to stabilize disturbed soils, which would minimize the potential for indirect impacts to vegetation as a result of erosion of exposed disturbed soils from stormwater runoff.

YPG would modify its INRMP to address invasive plant species control in the new disturbed areas. Without future management to control exotic invasive plant species, the impacts to vegetation from displacement of native species could be significant. Continued implementation of the YPG ITAM program would help to maintain desert vegetation in areas used for training activities. It would also maintain or rehabilitate testing and training areas to maintain conditions that realistically simulate conditions in other desert regions.

3.22.2.14 Visual Resources

The use of dust suppression practices during construction would minimize the amount of airborne dust. New buildings would be designed using the YPG Installation Design Guide to blend with the existing visual landscape. The YPG Environmental Awareness program developed instructions for units training on YPG that include proper procedures and avoidance measures to be implemented during ground-based training activities to minimize potential impacts to areas of aesthetic and visual value.

3.22.2.15 Water Resources

There would be potential for localized increased runoff from new impervious areas. Without appropriate control measures, increased runoff could affect downstream areas, including off-post lands, by creating scour that could remove soils from uplands along washes. Stormwater controls would be implemented to facilitate infiltration and reduce the

potential for scour (for example, site design, use of temporary detention areas, preserving existing vegetation, mulching, and use of pervious and semi-pervious surfaces).

YPG would obtain a CWA Section 404 permit from USACE and CWA Section 401 Water Quality certification from ADEQ prior to construction of the Aberdeen Road flood improvements. YPG and its construction contractor would be required to comply with all conditions of the CWA Section 404 permit and Section 401 Water Quality certification, including implementation of any mitigation that may be specified as a condition of the permit.

The INRMP directs YPG to comply with all applicable federal, state, and local laws and regulations, including CWA Section 404 permits, CWA Section 401 water quality certifications, and Arizona Department of Water Resources Water Rights.

3.22.2.16 Wildlife and Fisheries

The following steps would be used when practicable to minimize impacts: avoid wildlife concentration areas; avoid impacts to water sources; schedule construction projects to avoid or minimize conflicts with reproduction; and continue to implement INRMP procedures.

YPG considered potential impacts to wildlife in selecting locations for proposed activities in order to avoid wildlife concentration and water sources. When implementing construction projects in areas where wildlife are likely to nest or den, YPG would schedule construction to occur outside the nesting or denning period where practicable.

Through continued implementation of the INRMP, YPG utilizes the best available scientific knowledge and techniques to manage wildlife, including, but not limited to: survey, monitor, and analyze wildlife population trend information; assess wildlife habitat needs; maintain wildlife habitat needs; maintain wildlife movement corridors and migration routes; ensure water tanks provide the needed water for wildlife; and relocate wildlife; minimize illegal hunting and unauthorized activities. YPG cooperates with AZGFD and USFWS for wildlife rehabilitation and law enforcement.

Measures that would be implemented to avoid or minimize impacts to soils, vegetation, and water resources would provide indirect benefits to wildlife through improved habitat conditions.

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SECTION 4

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Melanie Wiggins	BS, Biology MAS, Environmental Policy and Management	18	3
Kira Zender	MS, Urban and Regional Planning	18	All

SECTION 5

Distribution List

Native American Organization

Ak-Chin Indian Community

Chemehuevi Indian Tribe

Cocopah Indian Tribe

Colorado River Indian Tribes

Fort McDowell Yavapai Nation

Fort Mojave Indian Tribe

Gila River Indian Community Council

Quechan Indian Tribe

Salt River Pima-Maricopa Indian
Community

San Carlos Apache Tribe

Hopi Tribe

Tohono O'odham Nation

Yavapai-Apache Nation

Yavapai-Prescott Indian Tribe

Agency

ACC PMS/CEV

Arizona Department of Agriculture, Native Plant Program

Arizona Department of Environmental Quality

Arizona Department of Environmental Quality, Air Quality Division

Arizona Game and Fish Department

Bureau of Indian Affairs—Western Regional Office

Bureau of Land Management, Yuma District Office

Environmental Department MCAS Yuma

Imperial National Wildlife Refuge

Kofa National Wildlife Refuge

Southwest Arizona National Wildlife Refuge Complex

U.S. Border Patrol

U.S. Bureau of Reclamation, Yuma Area Office

U.S. Environmental Protection Agency, Region IX

U.S. Fish and Wildlife Service

Wellton-Mohawk Natural Resources Conservation District

NRCS Yuma Service Center

Laguna Natural Resource Conservation District (NRCD), Yuma NRCD

Public and Local Government

Arizona Deer Association

Arizona Desert Bighorn Sheep Society

Arizona Historical Society

Arizona Wilderness Coalition

Audubon Society

City of Yuma

Greater Yuma Economic Development Corp

La Paz County

Sierra Club, Grand Canyon Chapter

Yuma Chamber of Commerce Military Affairs Committee

Yuma County

Yuma County Chamber of Commerce

Yuma County Development Services

Political Representatives

City of Yuma

Congressman Raul M. Grijalva—AZD07

House of Representatives

La Paz County Community Development

United States Senate

Yuma County

SECTION 6

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Public Involvement and Persons Contacted

7.1 Introduction

NEPA is intended to ensure public participation in the EIS process. Public participation includes effective communication between all federal, state, and local agencies, tribal governments, and other persons or organizations that may have an interest in the project. As required by NEPA, the public was invited to attend public scoping meetings held on June 14 and 15, 2011. Agency scoping meetings were held on June 14, 2011. Public meetings on the Draft Programmatic Environmental Impact Statement were conducted on September 24 and 25, 2013, and public comments on the Proposed Action were solicited. There will be a notice to the public of the waiting period between issuance of the FPEIS and signature of the ROD. Other methods used to reach the general public and interested stakeholders included meeting announcements in newspapers and news releases to local print and broadcast news media. Further public communication includes maintaining contact with public officials and agency representatives, ensuring that calls from the public are addressed in a timely manner, and contacting stakeholders through placement of notices of public meetings. The Draft Programmatic Environmental Impact Statement was circulated to potentially interested stakeholders and comments requested. The FPEIS also will be circulated to potentially interested stakeholders and comments requested. Public involvement materials are located in Appendix A. These materials include copies of the NOI, public notices for the scoping meeting, the Notice of Availability, public notices for the Draft Programmatic Environmental Impact Statement public meetings, and the project mailing list.

7.2 Notice of Intent

An NOI to prepare a Programmatic EIS (PEIS) was published in the FR (Vol. 76, No. 101) on May 25, 2011.

7.3 Coordination

Potentially interested stakeholders were identified and invited to participate in the NEPA process. Table 7-1 identifies contacts for coordination of Native American Issues. State and Federal agency contacts are identified in Table 7-2. Table 7-3 lists the public stakeholders contacted and Table 7-4 identifies the local, state, and Federal political representatives who were contacted. Appendix A contains copies of correspondence directed to and received from cooperating local, state and federal agencies and tribal governments.

TABLE 7-1
Native American Coordination
Yuma Proving Ground

First Name	Last Name	Organization
Louis J.	Manuel, Jr.	Ak-Chin Indian Community Council
Caroline	Antone	Ak-Chin Indian Community
Charles	Wood	Chemehuevi Indian Tribe
Ronald	Escobar	Chemehuevi Indian Tribe
Sherry	Cordova	Cocopah Indian Tribe
Jill	McCormick	Cocopah Indian Tribe
Lisa	Swick	Colorado River Indian Tribes
Eldred	Enas	Colorado River Indian Tribes
Clinton M.	Pattea	Fort McDowell Yavapai Nation
Karen	Ray	Fort McDowell Yavapai Nation Community
Linda	Otero	Fort Mojave Indian Tribe
Timothy	Williams	Fort Mojave Tribal Council
Barnaby V.	Lewis	Gila River Indian Community Council
William R.	Rhodes	Gila River Indian Community Council
Mike	Jackson, Sr.	Quechan Indian Tribe
Bridget	Nash-Chrabascz	Quechan Indian Tribe
Diane	Enos	Salt River Pima-Maricopa Indian Community
Kelly	Washington	Salt River Pima-Maricopa Indian Community
Vernelda	Grant	San Carlos Apache Tribe
Terry	Rambler	San Carlos Apache Tribe
Leigh	Kuwanwisiwma	Hopi Tribe
LeRoy N.	Shingoitewa	Hopi Tribe
Ned	Norris, Jr.	Tohono O'odham Nation
Peter	Steere	Tohono O'odham Nation
David	Kwail	Yavapai-Apache Nation
Delores	Plunkett	Yavapai-Apache Nation
Ernest	Jones, Sr.	Yavapai-Prescott Indian Tribe
Linda	Ogo	Yavapai-Prescott Indian Tribe

TABLE 7-2
State and Federal Agency Coordination
Yuma Proving Ground

First Name	Last Name	Agency
Elvie R.	Hoag	ACC PMS/CEV
James	McGinnis	Arizona Department of Agriculture, Native Plant Program
Delfina C.	Olivarez	Arizona Department of Environmental Quality
Edward	Ranger	Arizona Department of Environmental Quality
Henry	Darwin	Arizona Department of Environmental Quality, Air Quality Division
Rebecca	Davidson	Arizona Game and Fish Department
Troy	Smith	Arizona Game and Fish Department
Bryan	Bowker	Bureau of Indian Affairs—Western Regional Office
Irene	Herder	Bureau of Indian Affairs—Western Regional Office
Dave	Daniels	Bureau of Land Management, Yuma District Office
Dave	Rodriguez	Environmental Department MCAS Yuma
Elaine	Johnson	Imperial National Wildlife Refuge
Susanna	Henry	Kofa National Wildlife Refuge
Mitch	Ellis	Southwest Arizona National Wildlife Refuge Complex
Richard	Hays	U.S. Border Patrol
Cynthia	Hoeft	Bureau of Land Management, Yuma District Office
Christopher	Wallis	U.S. Bureau of Reclamation, Yuma Area Office
Wayne	Nastri	U.S. Environmental Protection Agency, Region IX
Steven L.	Spangle	U.S. Fish and Wildlife Service
David	Sharpe	Wellton-Mohawk Natural Resources Conservation District
Cheryl	Lambert	NRCS Yuma Service Center
Sheryl	Christenson	Laguna Natural Resource Conservation District (NRCD), Yuma NRCD

TABLE 7-3
Public Stakeholder Coordination
Yuma Proving Ground

First Name	Last Name	Organization
Pete	Cimellaro	Arizona Deer Association
Bill	Luffy	Arizona Desert Bighorn Sheep Society
Carol	Brooks	Arizona Historical Society
Jason	Williams	Arizona Wilderness Coalition
Patricia	Rather	Audubon Society

TABLE 7-3
Public Stakeholder Coordination
Yuma Proving Ground

First Name	Last Name	Organization
Julie	Engel	Greater Yuma Economic Development Corp
Sandy	Bahr	Sierra Club, Grand Canyon Chapter
Don	Foltz	Yuma Chamber of Commerce Military Affairs Committee
Ken	Rosevear	Yuma County Chamber of Commerce
Monty	Stansbury	Yuma County Development Services

TABLE 7-4
Political Representatives
Yuma Proving Ground

First Name	Last Name	Organization
Alan	Krieger	City of Yuma
Laurie	Lineberry	City of Yuma
Charlene	Fernandez	Congressman Raul M. Grijalva—AZD07
Russ	Jones	House of Representatives
Lynne	Pancrazi	House of Representatives
Colleen	McVey	La Paz County Community Development
John	McCain	United States Senate
Don	Shooter	United States Senate
Scott	Bernhart	La Paz County
Robert	Pickles	Yuma County
Maria	Gonzalez	Yuma County

7.4 Scoping and Information Meetings

Federal, state, and local agencies, environmental groups, and the public were invited to attend open house public scoping meetings on Tuesday, June 14, 2011 at YPG and on Wednesday, June 15, 2011 in Yuma, Arizona.

The public scoping meetings announced the commencement of the PEIS process and were used to gather initial public concerns and issues. Background information was presented on the project and its purpose, the area of study, and the potential options available. A public notice was mailed to stakeholders prior to the public scoping meeting. Notice of the public scoping meeting was also posted in the local newspapers. At the scoping meeting, the public was given an opportunity to ask questions and make comments concerning the project. No comments were received at the public scoping meetings. The court reporter prepared an affidavit stating no comments were received.

7.5 Distribution of the FPEIS

Upon completion, the FPEIS will be posted on the YPG website and made available at local libraries. Copies of the FPEIS will also be available from YPG upon request.

7.6 Point of Contact

Written comments regarding this FPEIS should be sent to the following contact. Requests for more information may also be obtained from the following point of contact:

Attention: Sergio Obregon, National Environmental Policy Act Coordinator
U.S. Army Garrison Yuma Proving Ground
Environmental Division, IMWE-YMA-PWE
301 C Street, Yuma, Arizona 85365-9498

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SECTION 8

Public, Agency, and Tribal Comments and Responses

Agency/Tribal Comments Received

The following comments were received. The PEIS was revised, as appropriate based upon consideration of these comments. All comments and specific responses are provided in Appendix A.

The Hopi Tribe/May 9, 2011

Arizona Game and Fish Department/June 28, 2011

The Hopi Tribe/July 5, 2011

San Carlos Apache Tribe/June 2, 2012

The Hopi Tribe/May 7, 2012

Arizona State Historic Preservation Office/June 29, 2012

Advisory Council on Historic Preservation/ August 1, 2012

The Hopi Tribe/ August 6, 2012

Yavapai-Prescott Indian Tribe/September 4, 2012

Advisory Council on Historic Preservation/October 17, 2012

U.S. Environmental Protection Agency/September 26, 2013

Arizona Game and Fish Department/October 2, 2013

U.S. Fish and Wildlife Department/October 23, 2013

U.S. Fish and Wildlife Department/October 25, 2013

U.S. Fish and Wildlife Department/January 8, 2014

No Public Comments Received

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SECTION 9

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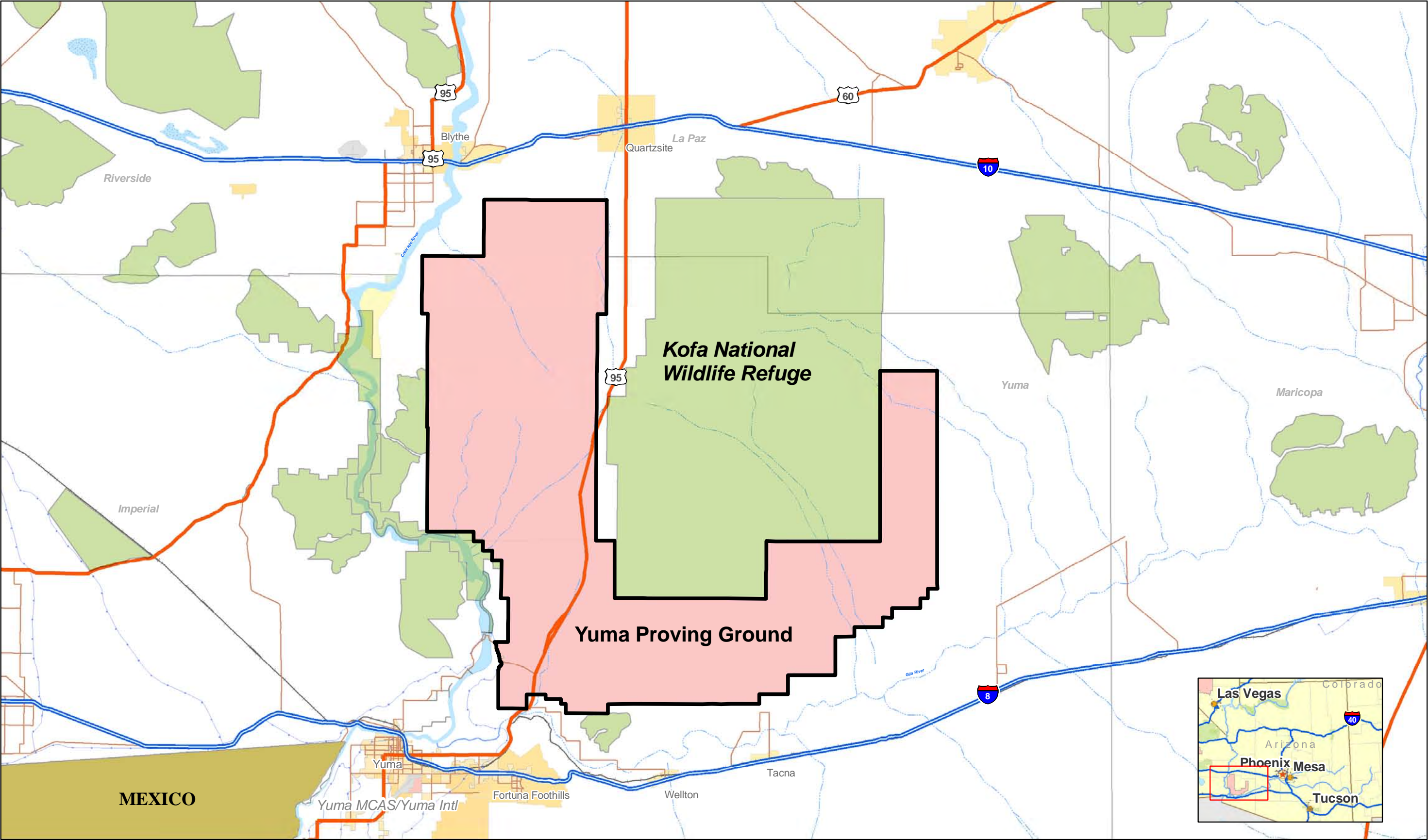
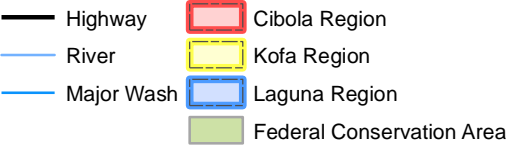
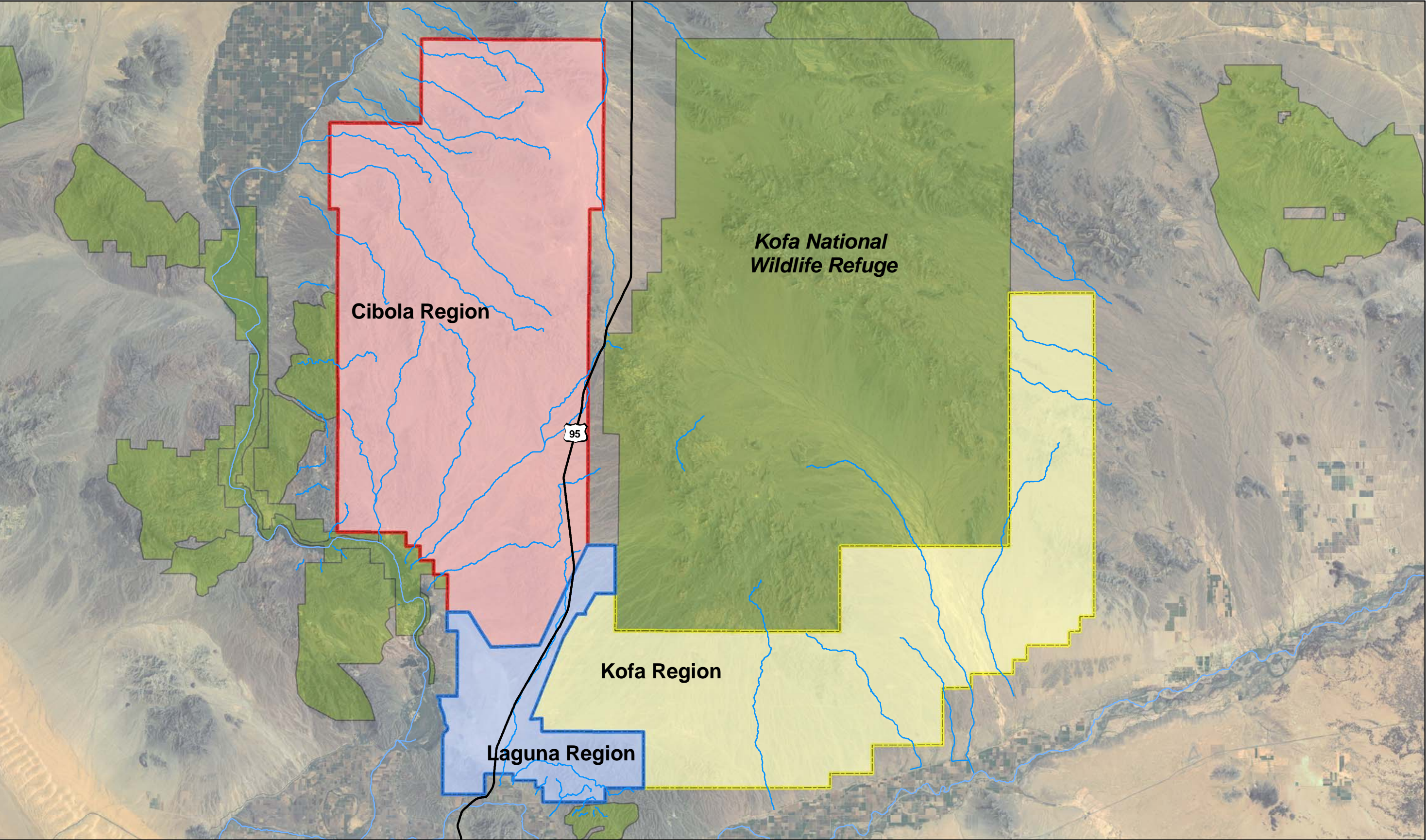


FIGURE 2-1
Project Location Map
Yuma Proving Ground
Yuma, Arizona



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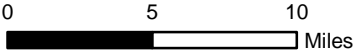
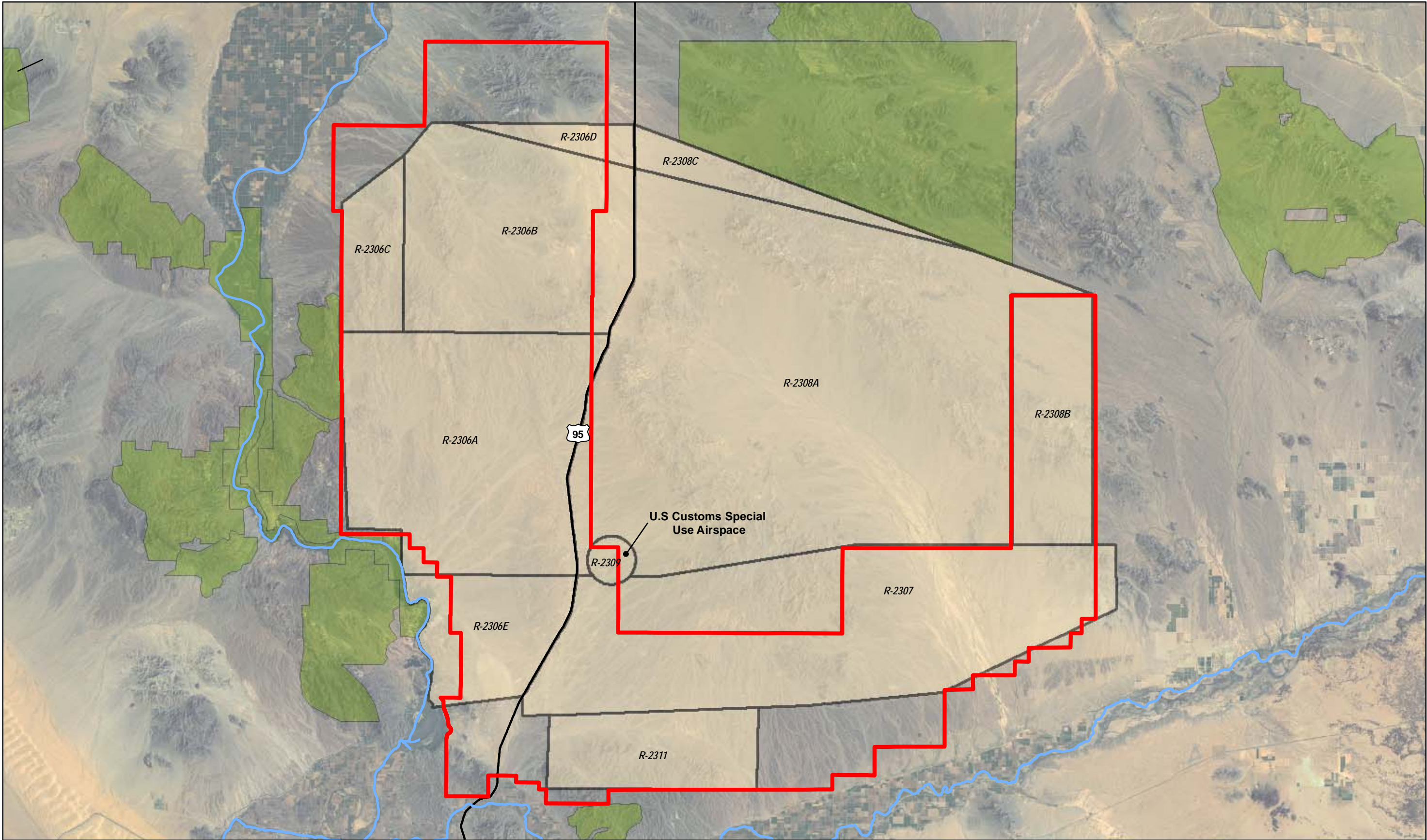


FIGURE 2-2
Designated Areas on Yuma Proving Ground
Yuma Proving Ground
Yuma, Arizona



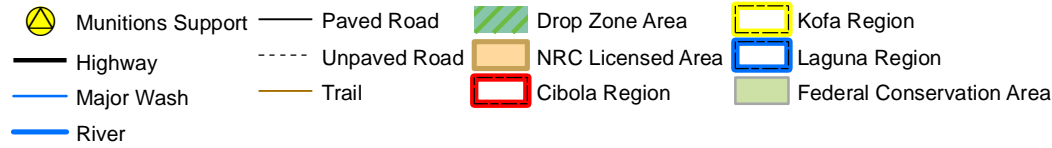
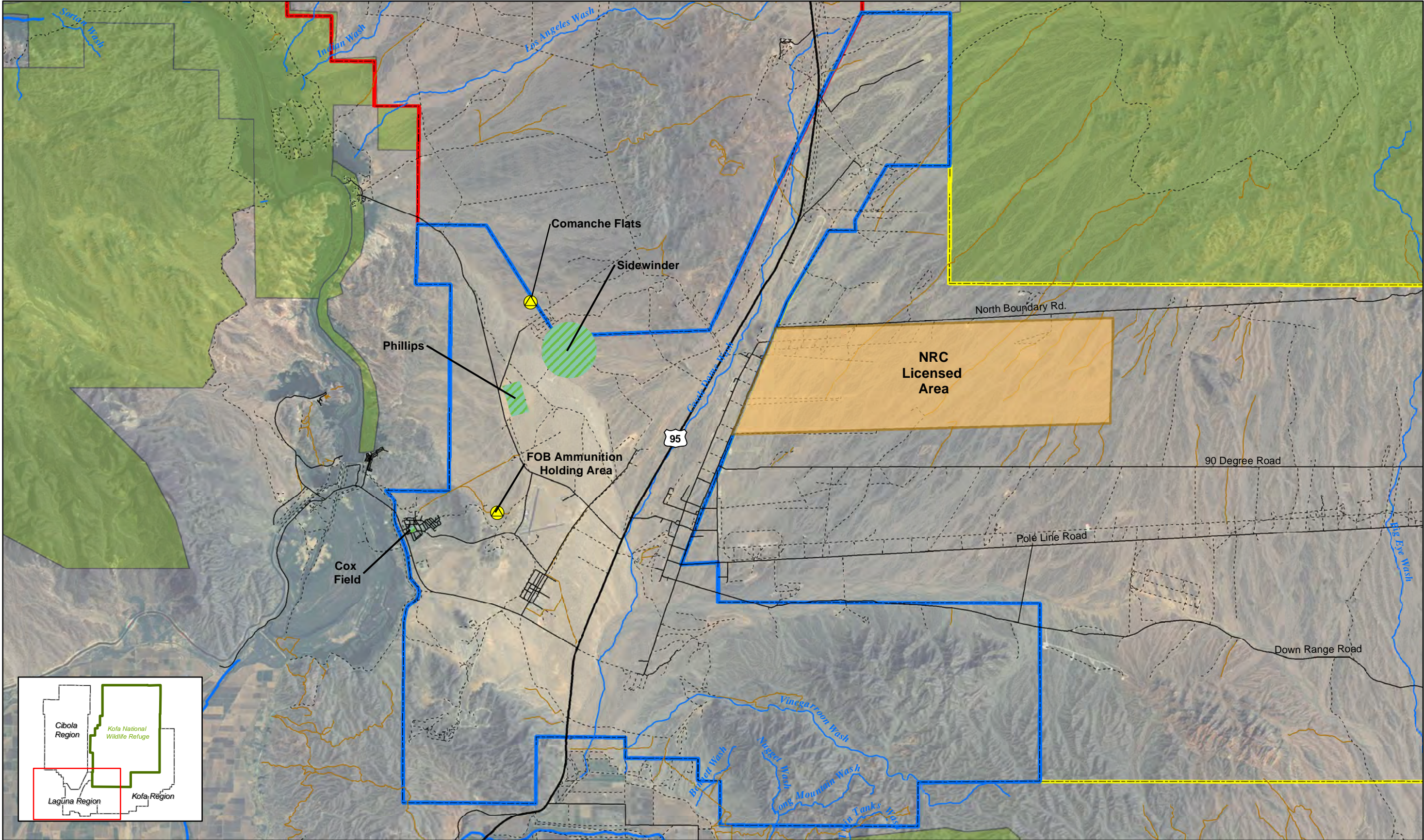
— River
— Highway
Restricted Airspace
Yuma Proving Ground

Imagery Source
ESRI Online/AEX 2006



0 5 10
Miles

FIGURE 2-3
Yuma Proving Ground Restricted Airspace
Yuma Proving Ground
Yuma, Arizona



Imagery Source:
ESRI Online/AEX, 2006

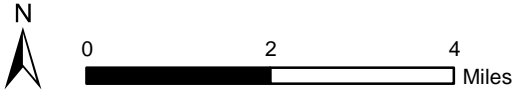
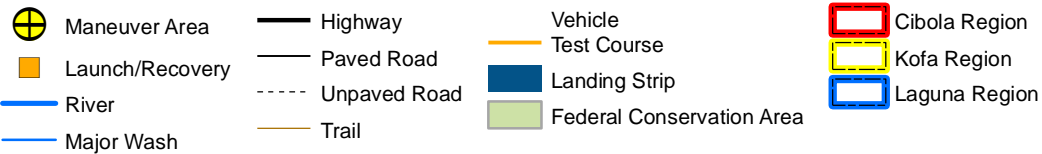
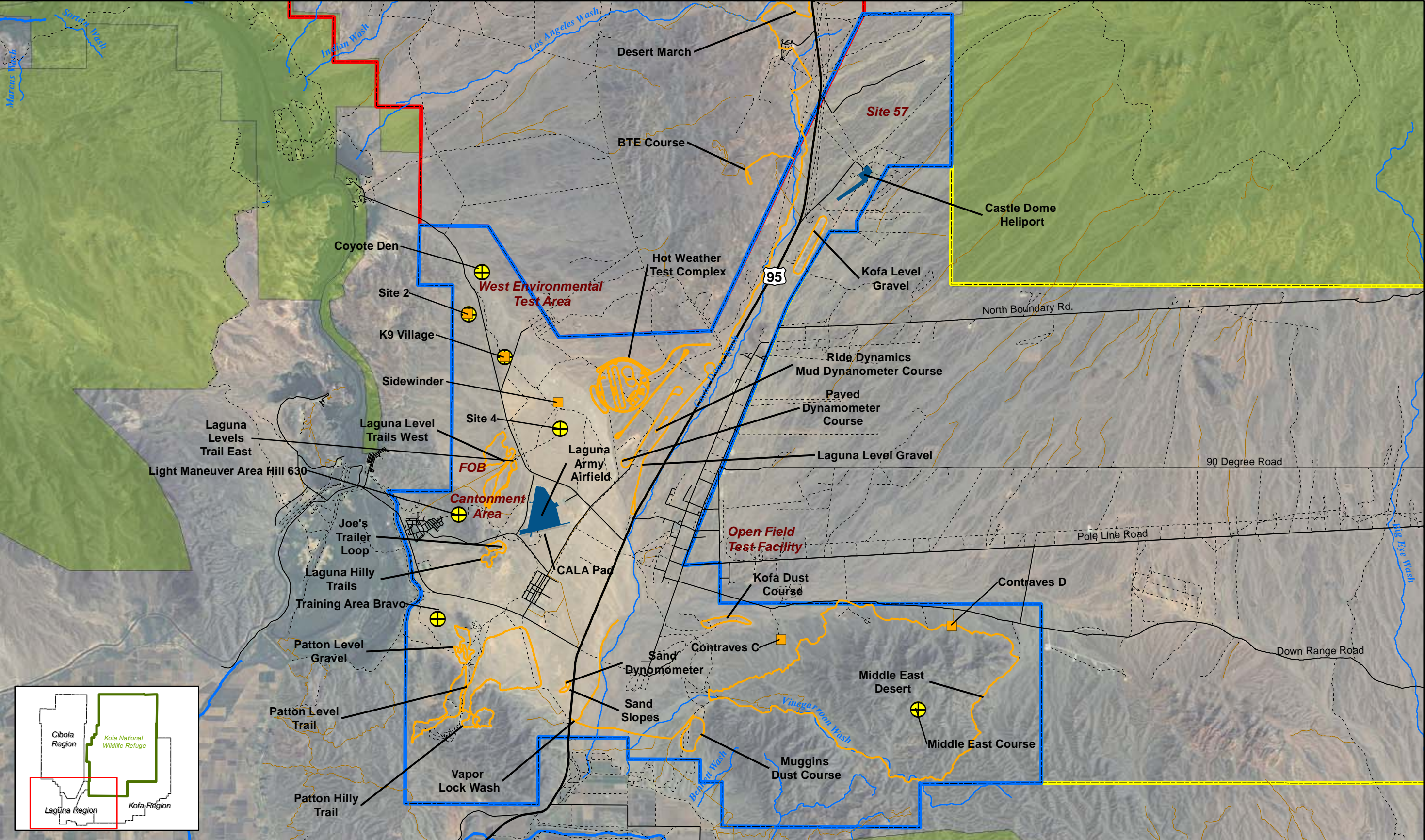


FIGURE 2-4
No Action Alternative -Impact Areas - Laguna Region
Yuma Proving Ground
Yuma, Arizona



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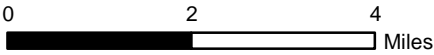
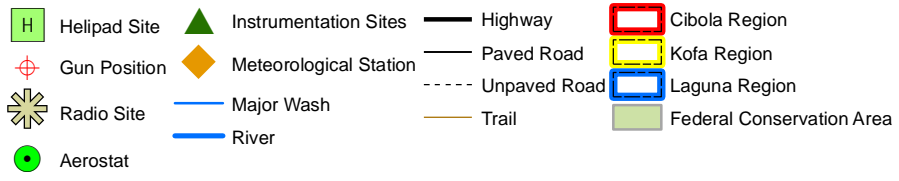
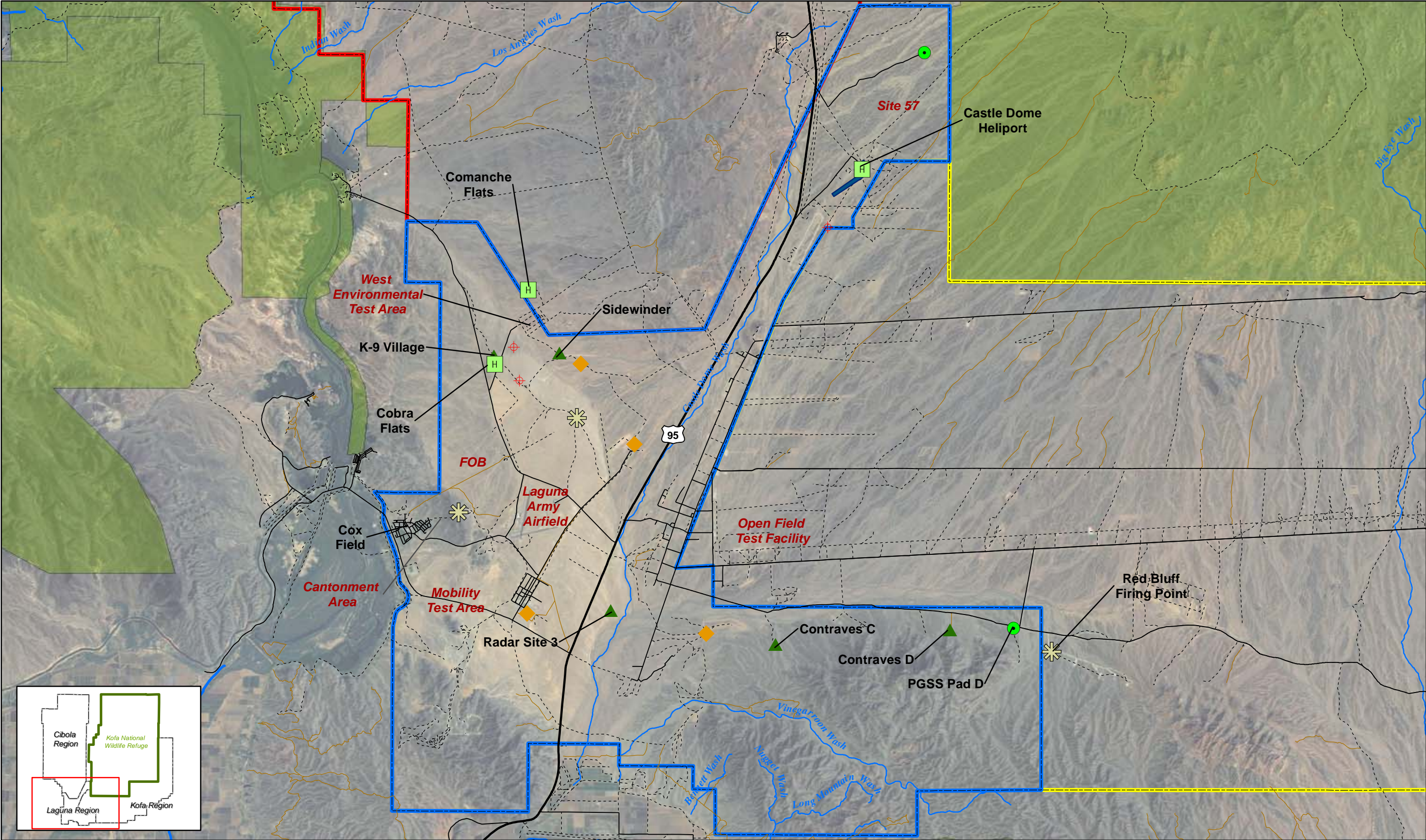


FIGURE 2-5
No Action Alternative -Training Courses and
Airfields - Laguna Region
Yuma Proving Ground
Yuma, Arizona



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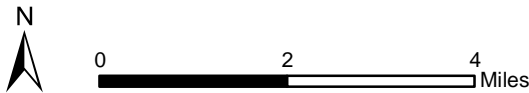
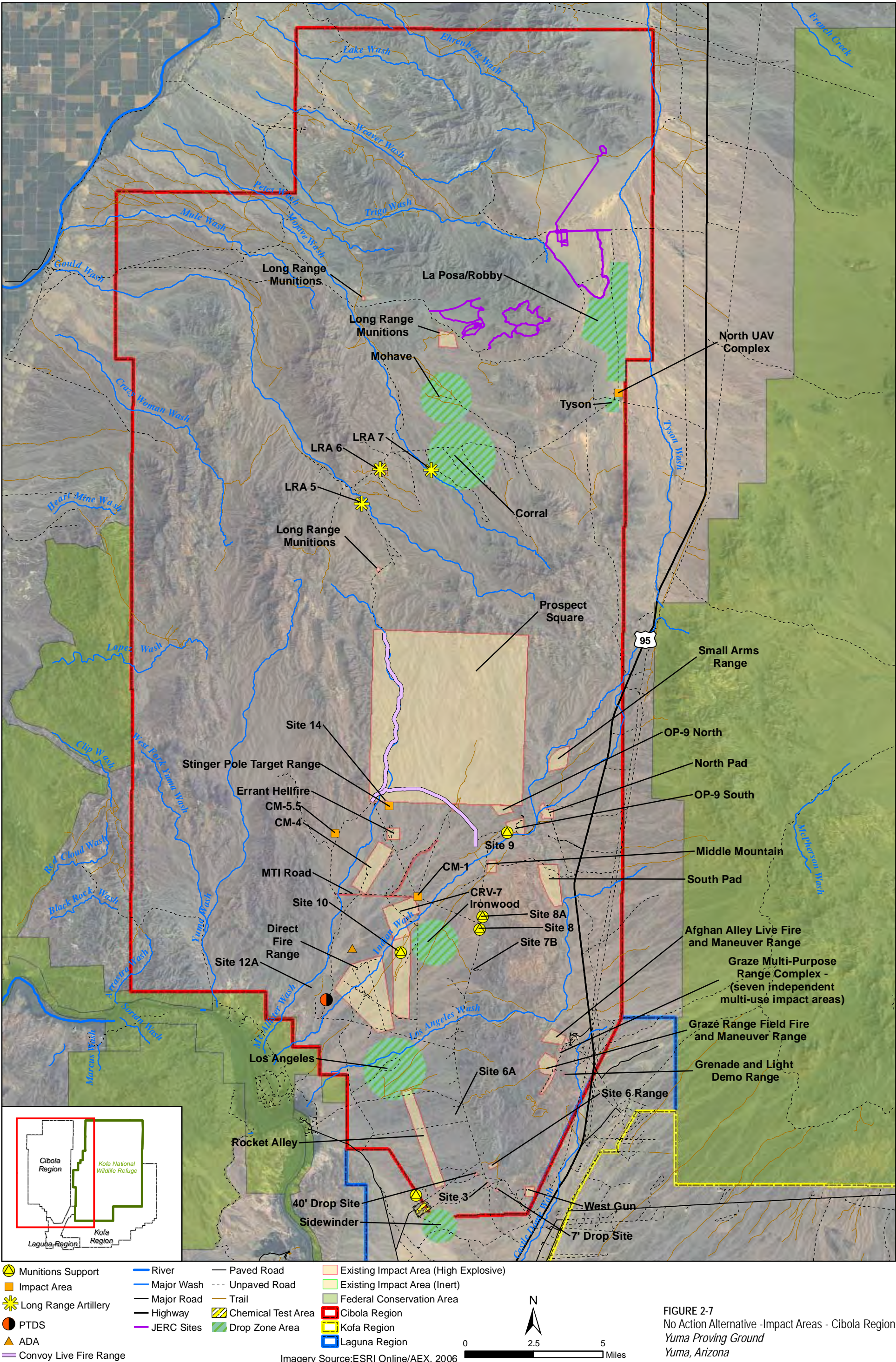
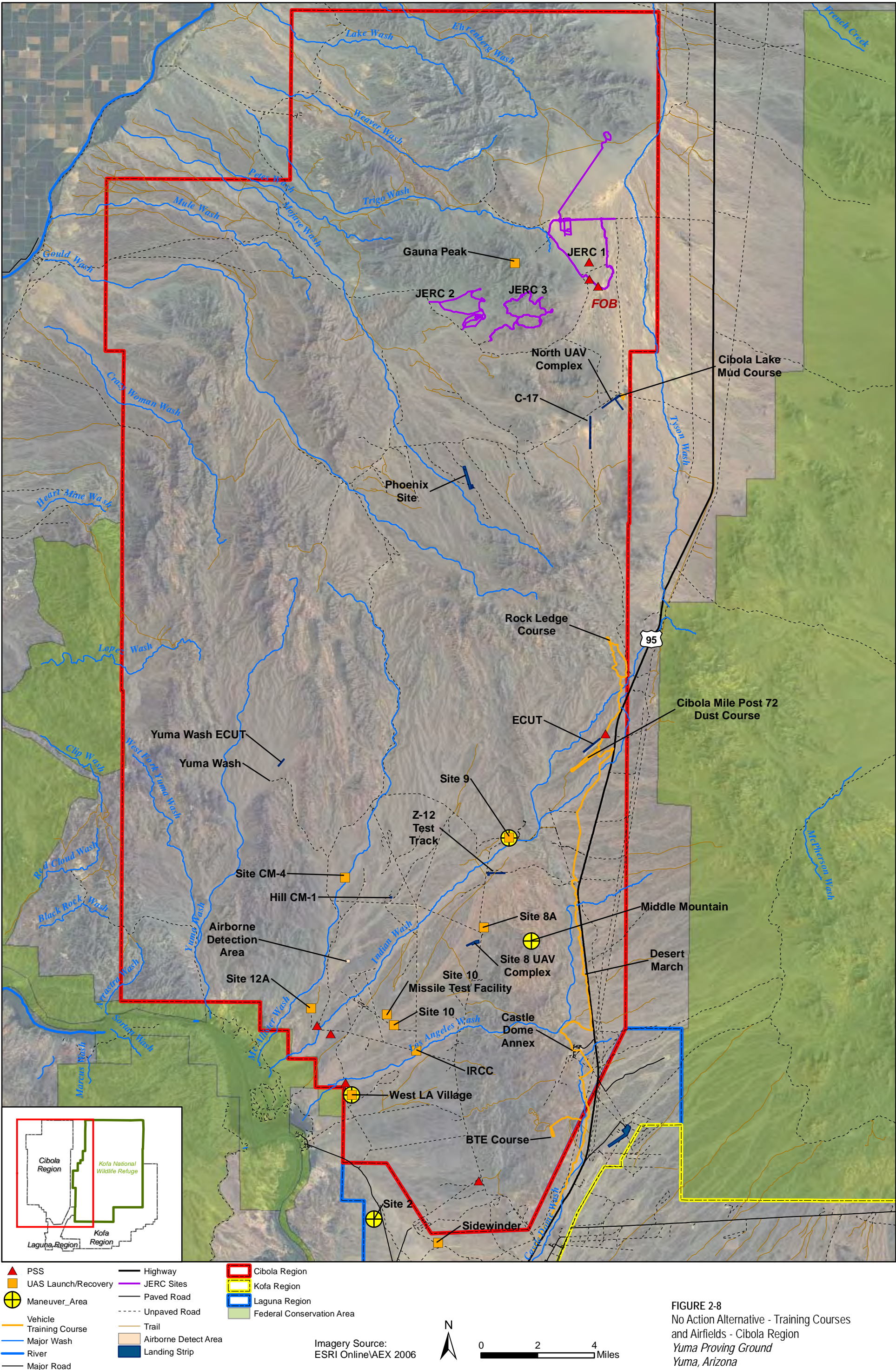
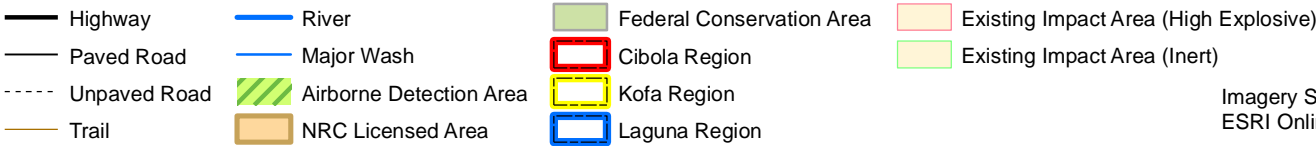
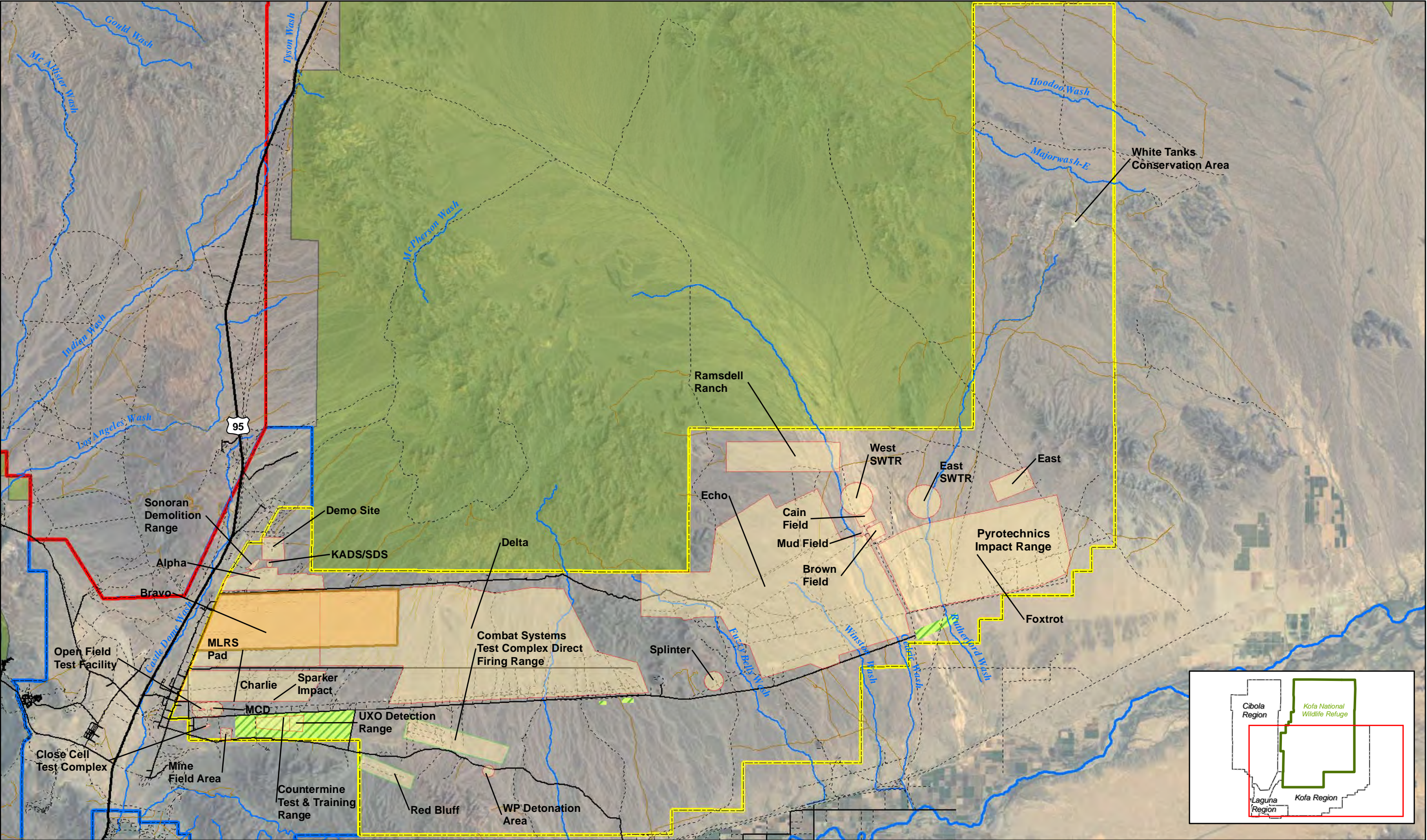


FIGURE 2-6
No Alternative Action -Points of Interest:
Towers, Stations, Instrumentation, and
Helipad Sites- Laguna Region
Yuma Proving Ground
Yuma, Arizona





CH2MHILL.



Imagery Source:
ESRI Online/AEX, 2006



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Miles

FIGURE 2-10
No Action Alternative - Impact Areas - Kofa Region
Yuma Proving Ground
Yuma, Arizona

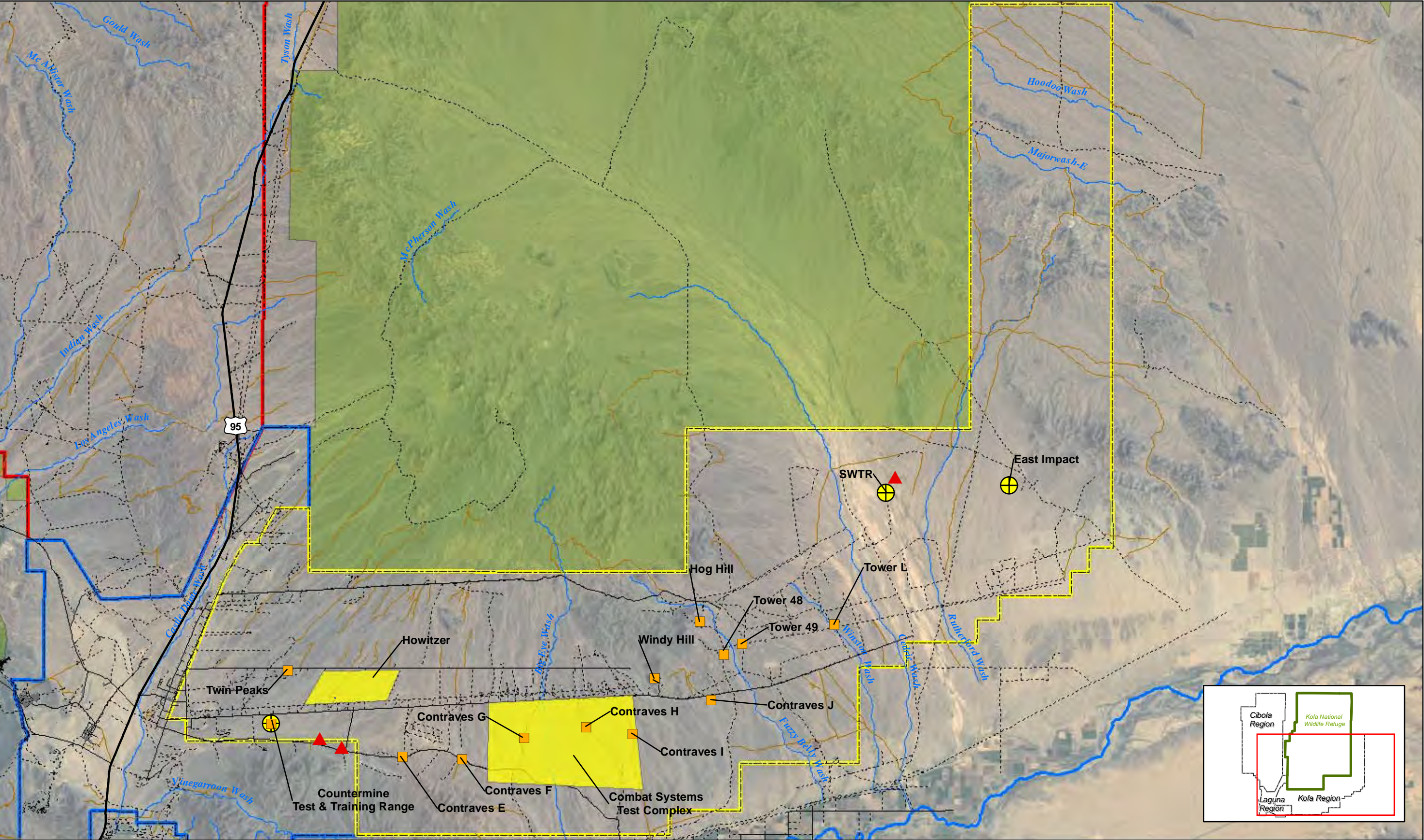
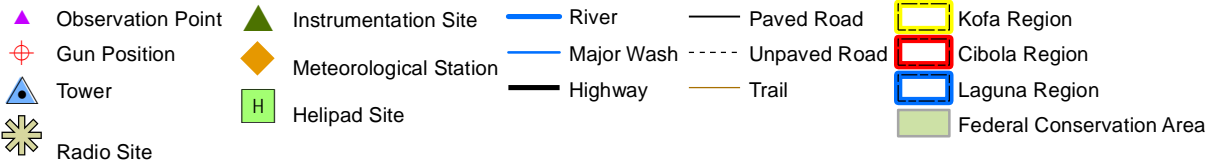
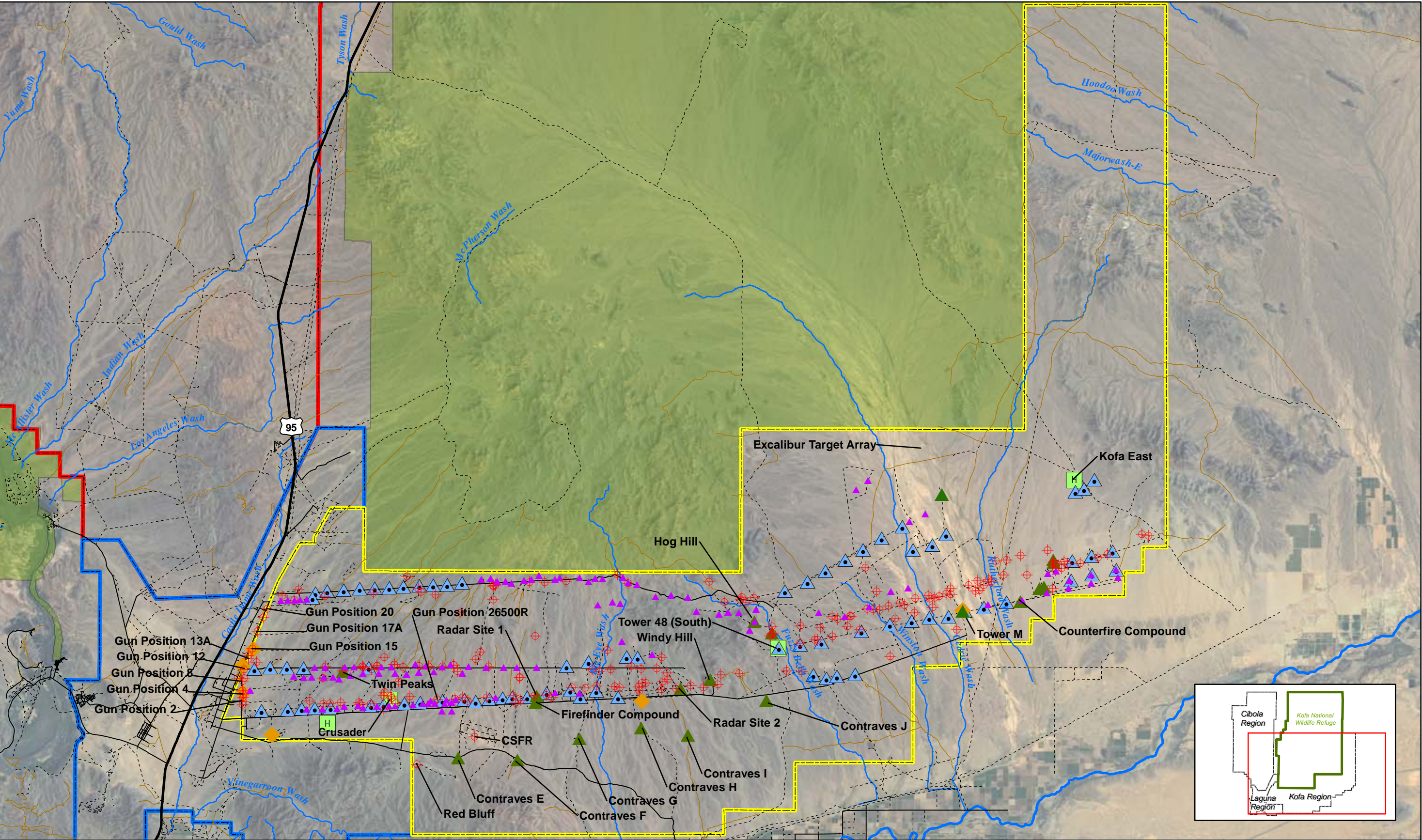


FIGURE 2-11
No Action Alternative Training Courses and
Airfields - Kofa Region
Yuma Proving Ground
Yuma, Arizona



Imagery Source:
ESRI Online/AEX, 2006

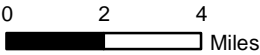


FIGURE 2-12
No Action Alternative -Points of Interest: Towers, Stations,
Instrumentation and Helipad Sites - Kofa Region
Yuma Proving Ground
Yuma, Arizona

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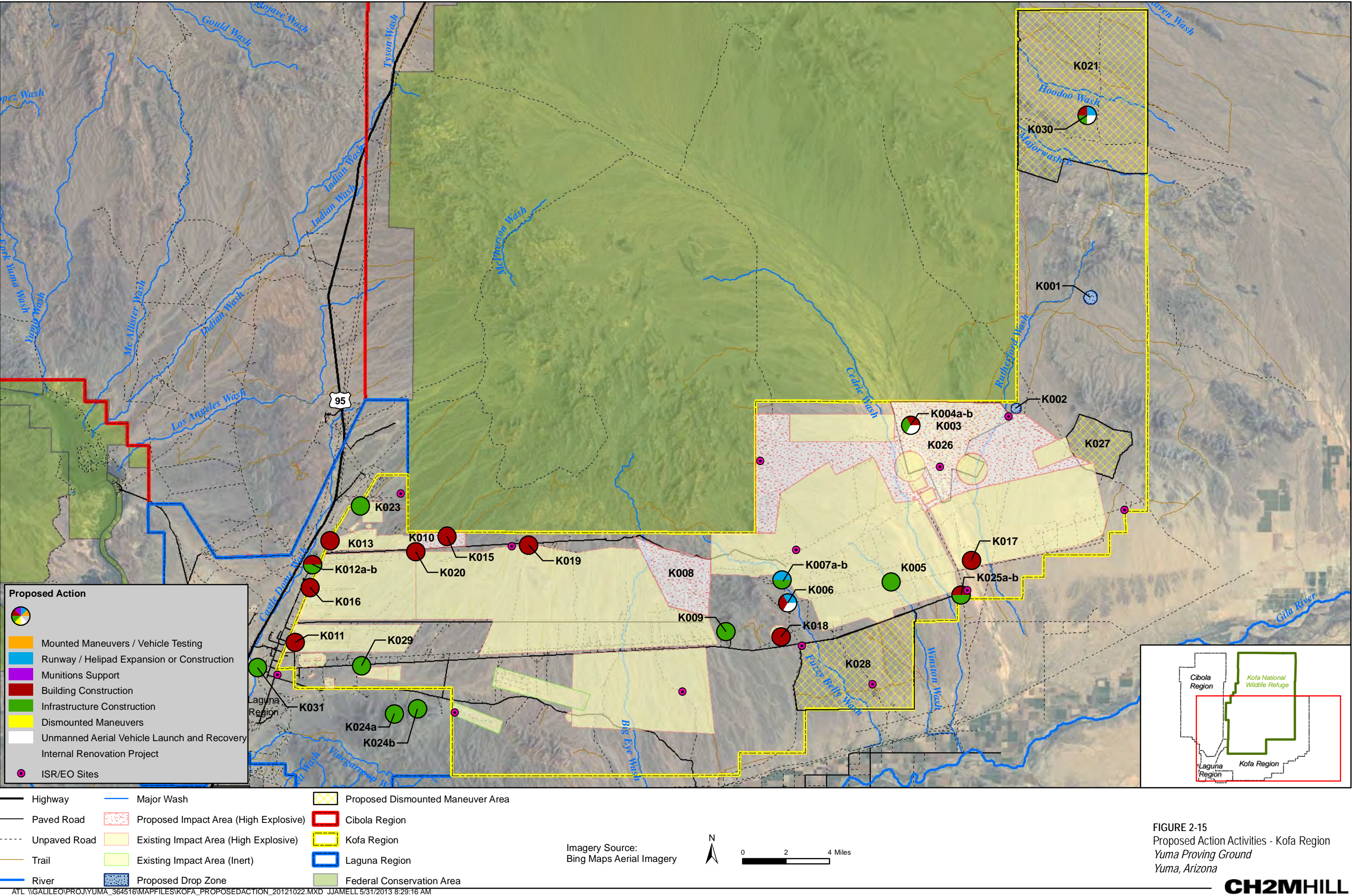


FIGURE 2-15
Proposed Action Activities - Kofa Region
Yuma Proving Ground
Yuma, Arizona

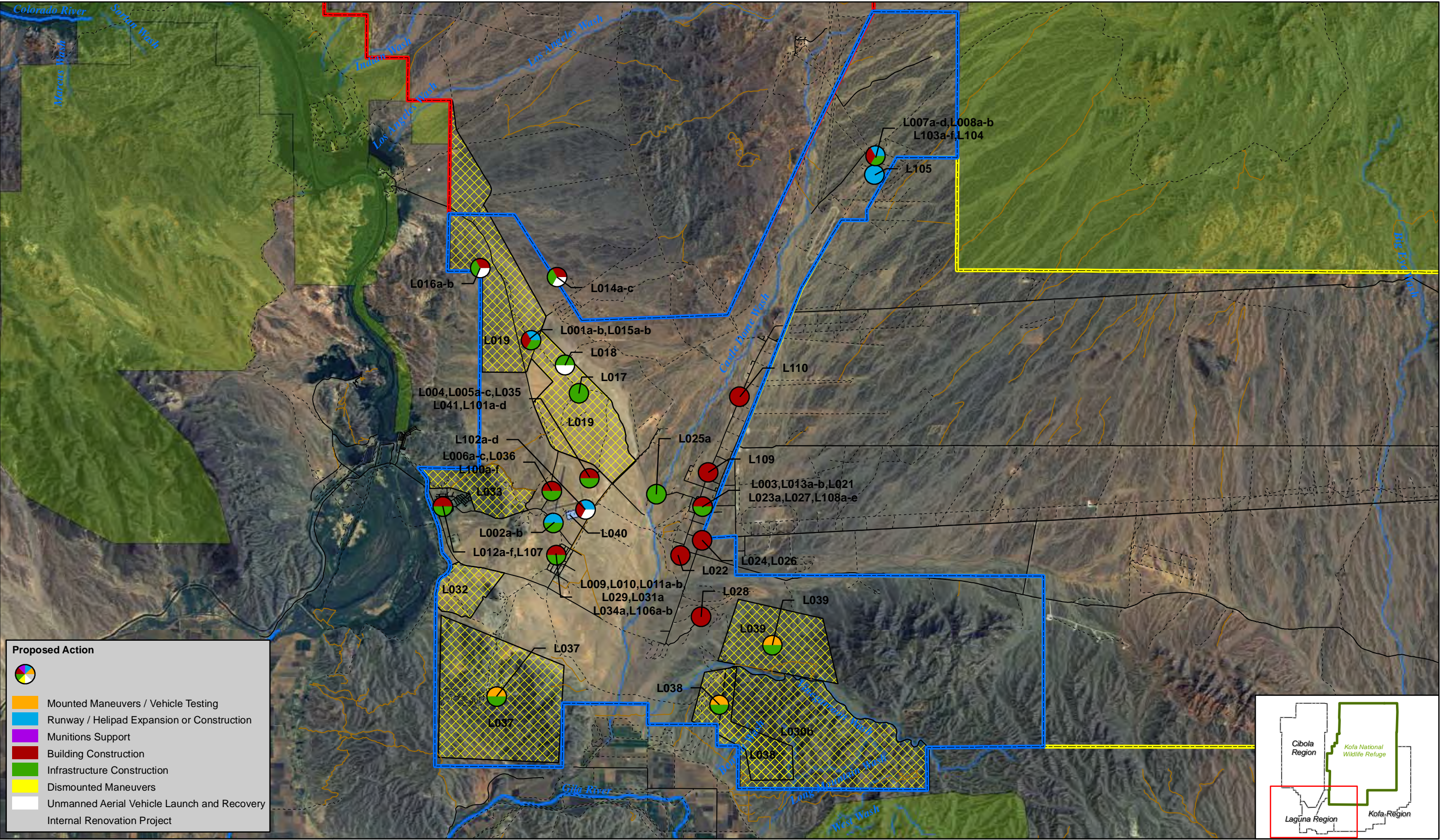
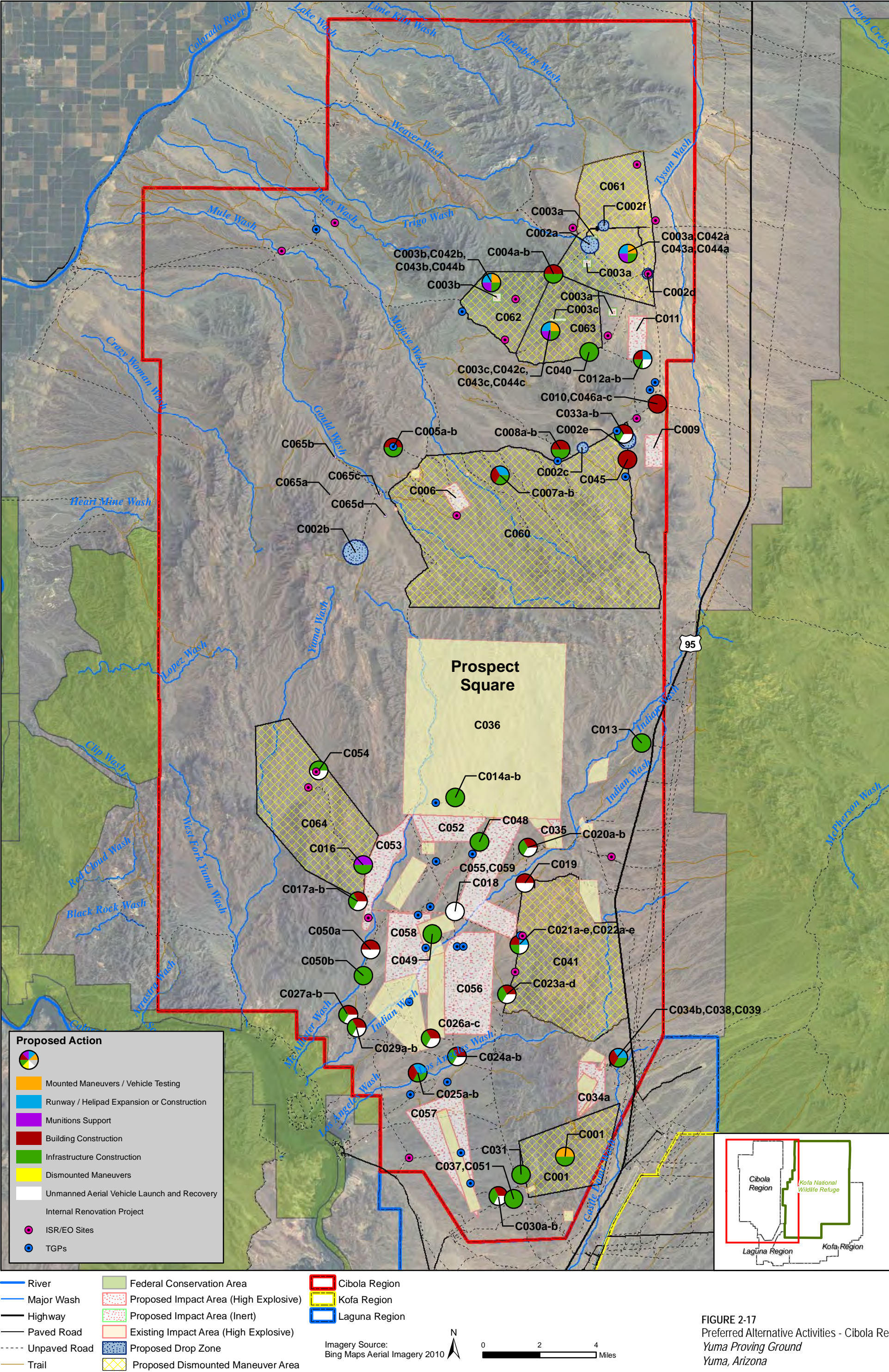
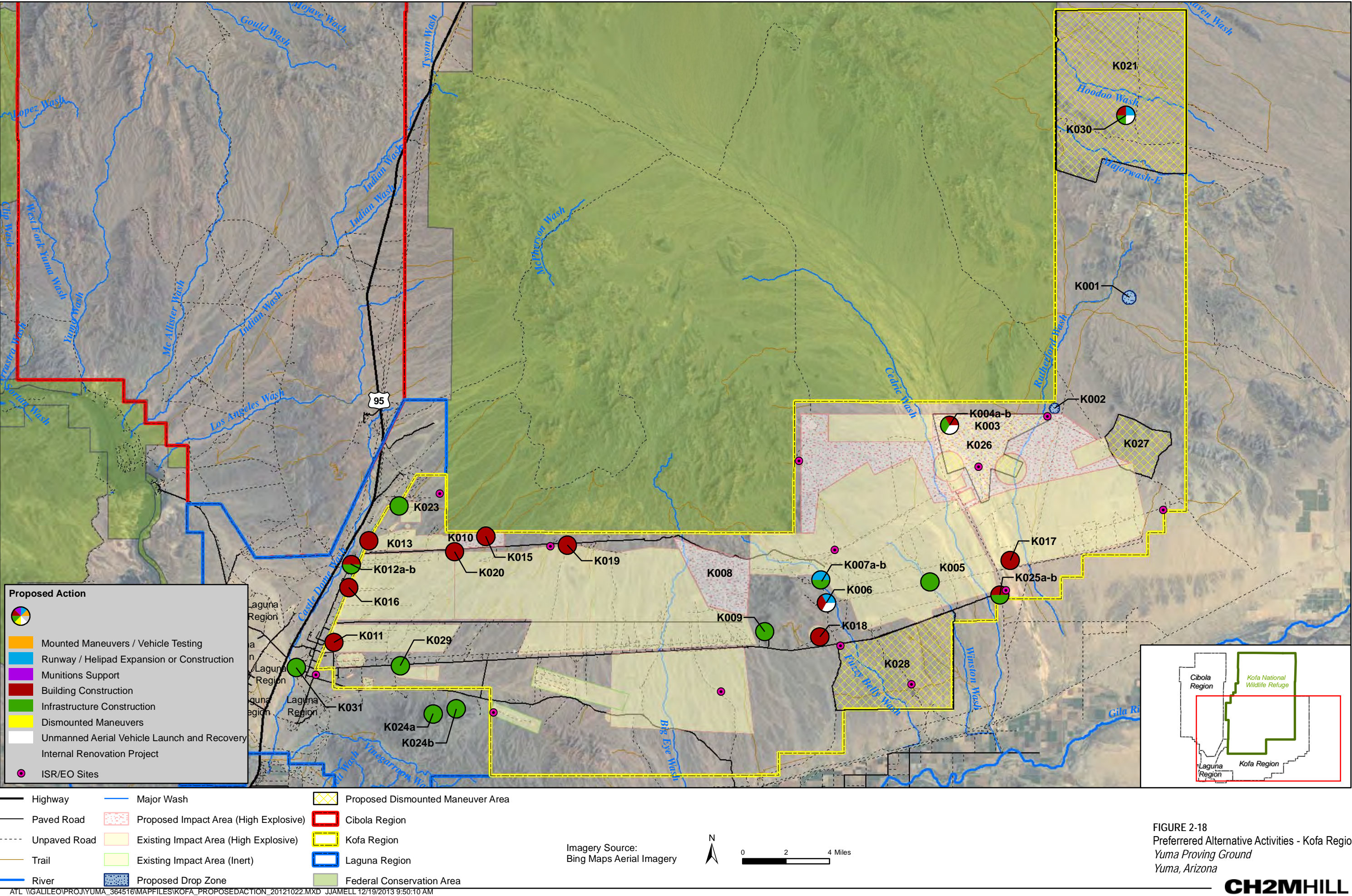


FIGURE 2-16
Preferred Alternative Activities - Laguna Region
Yuma Proving Ground
Yuma, Arizona





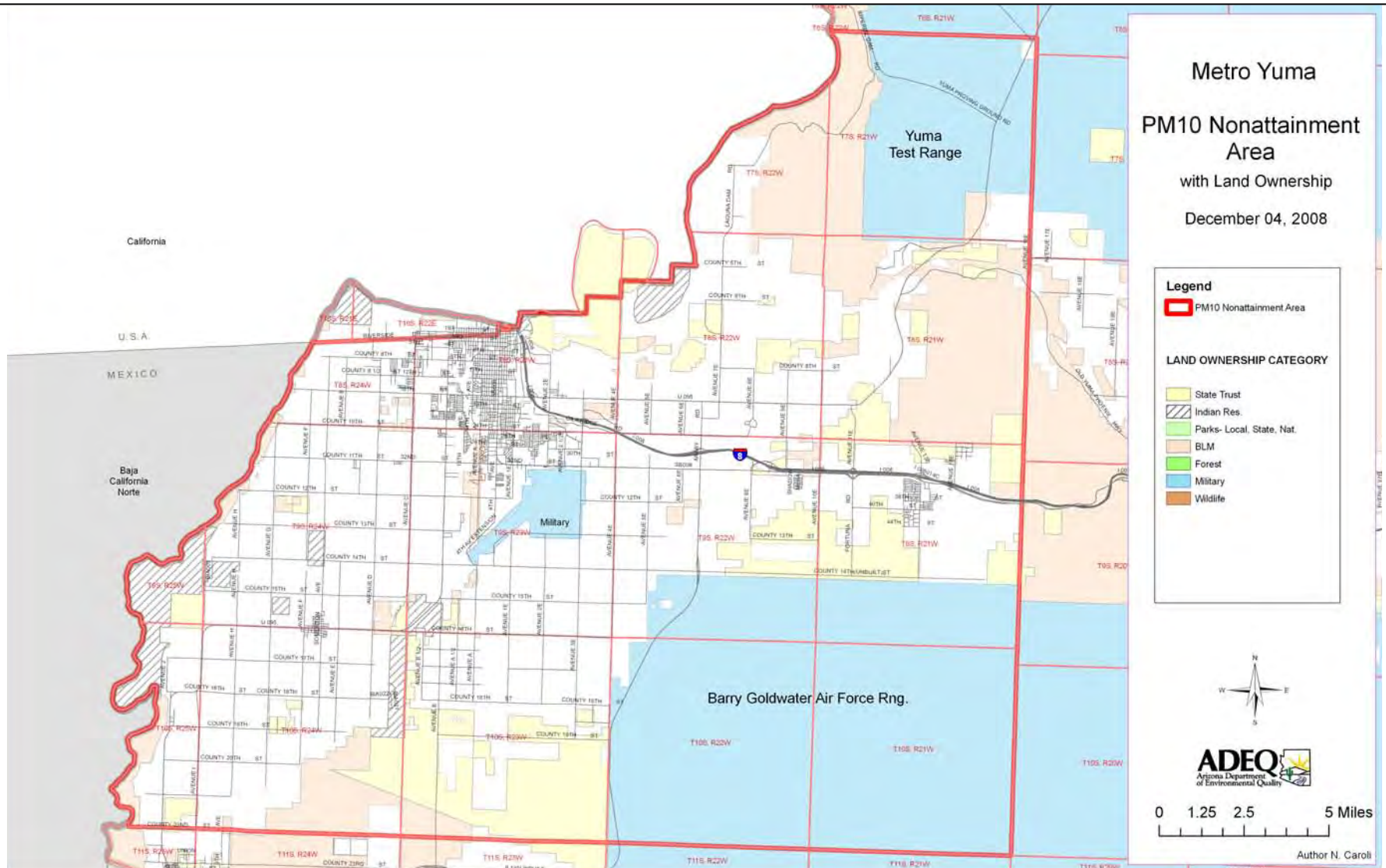
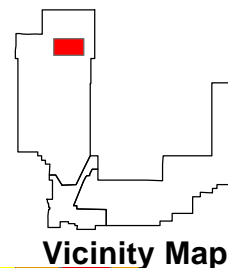
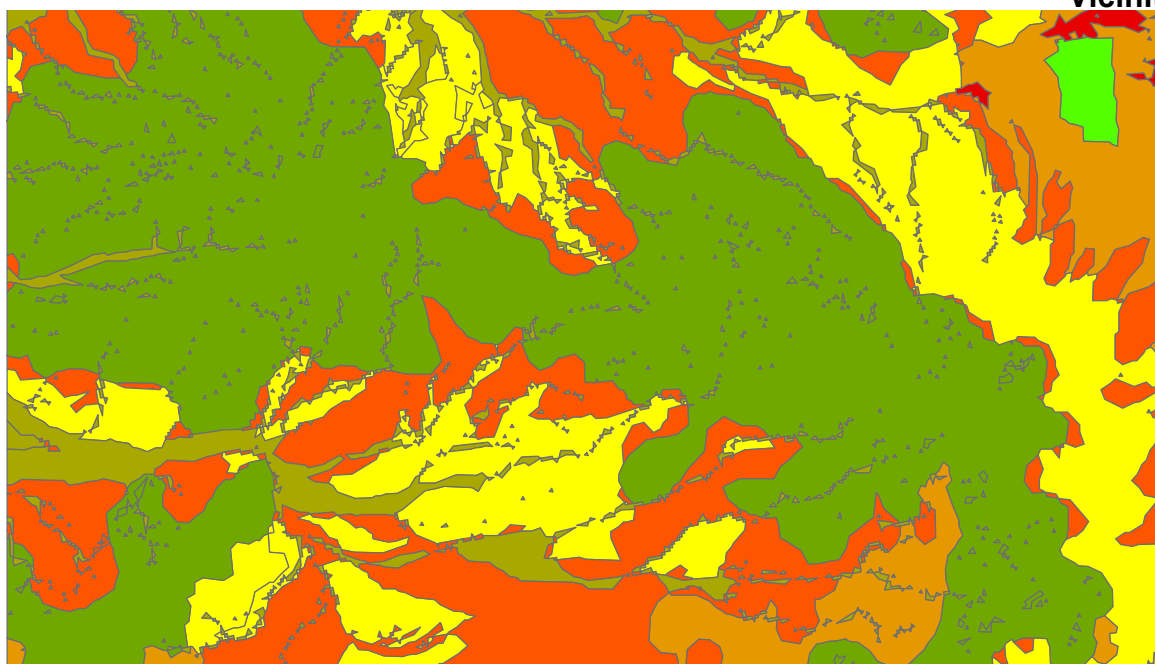


FIGURE 3-1
 Air Quality
 Yuma Proving Ground
 Yuma, Arizona



1998 Fuel Loads



2005 Fuel Loads

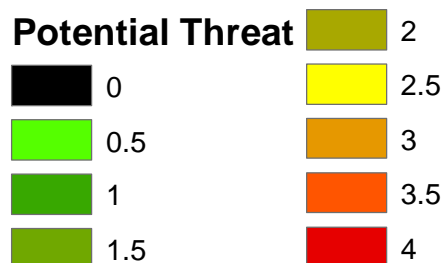
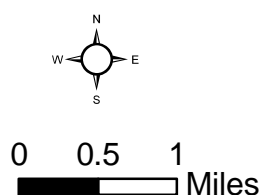
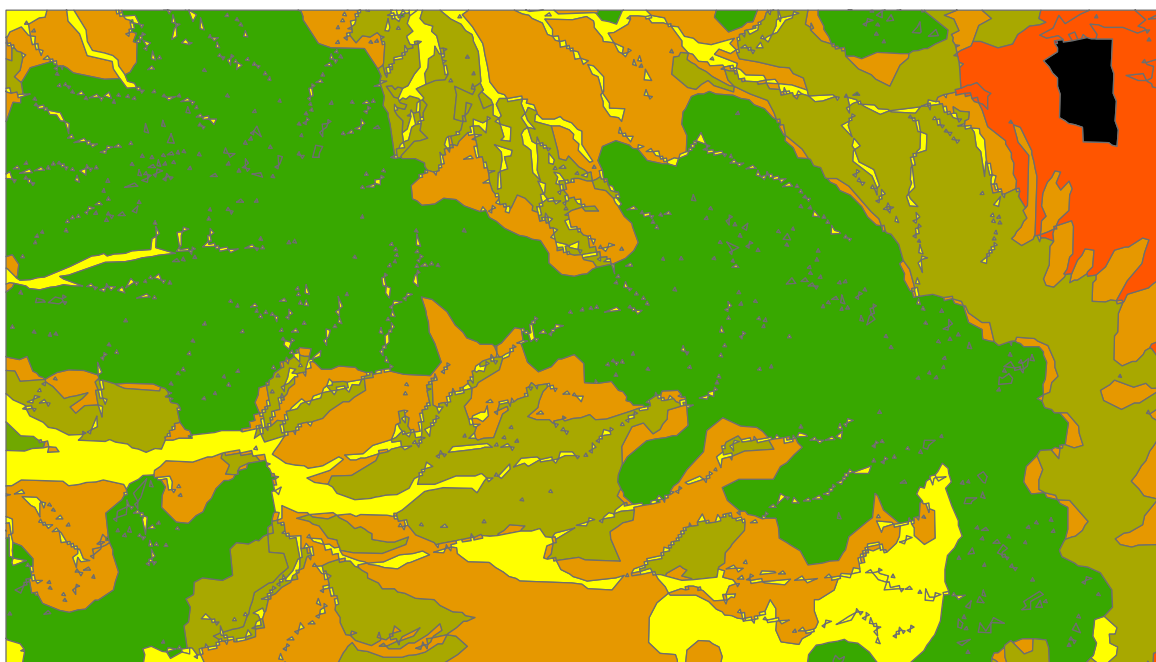


Figure 3-2
Comparison of Fuel Loads
in 1998 and 2005

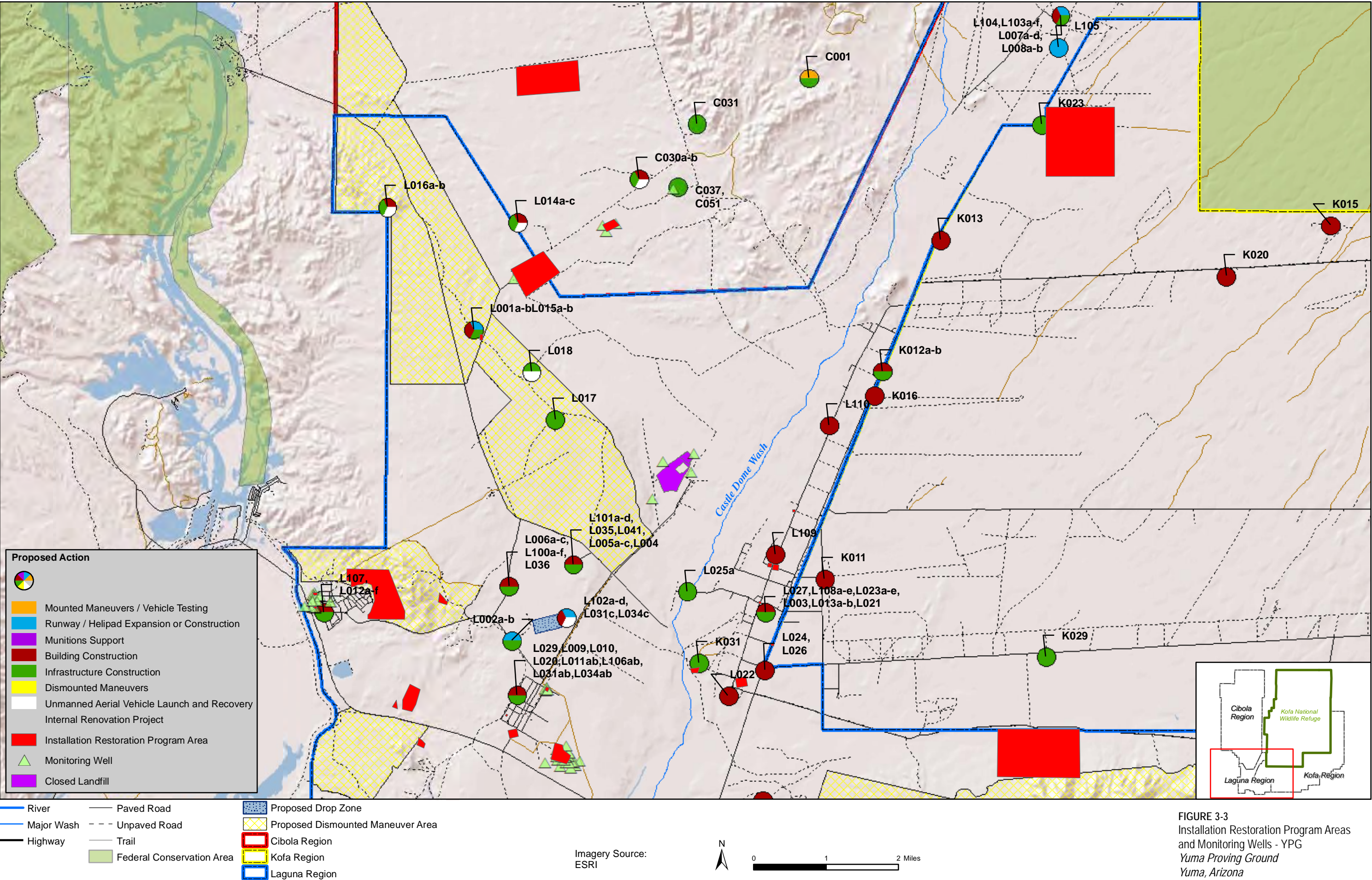


FIGURE 3-3
Installation Restoration Program Areas
and Monitoring Wells - YPG
Yuma Proving Ground
Yuma, Arizona

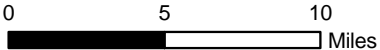
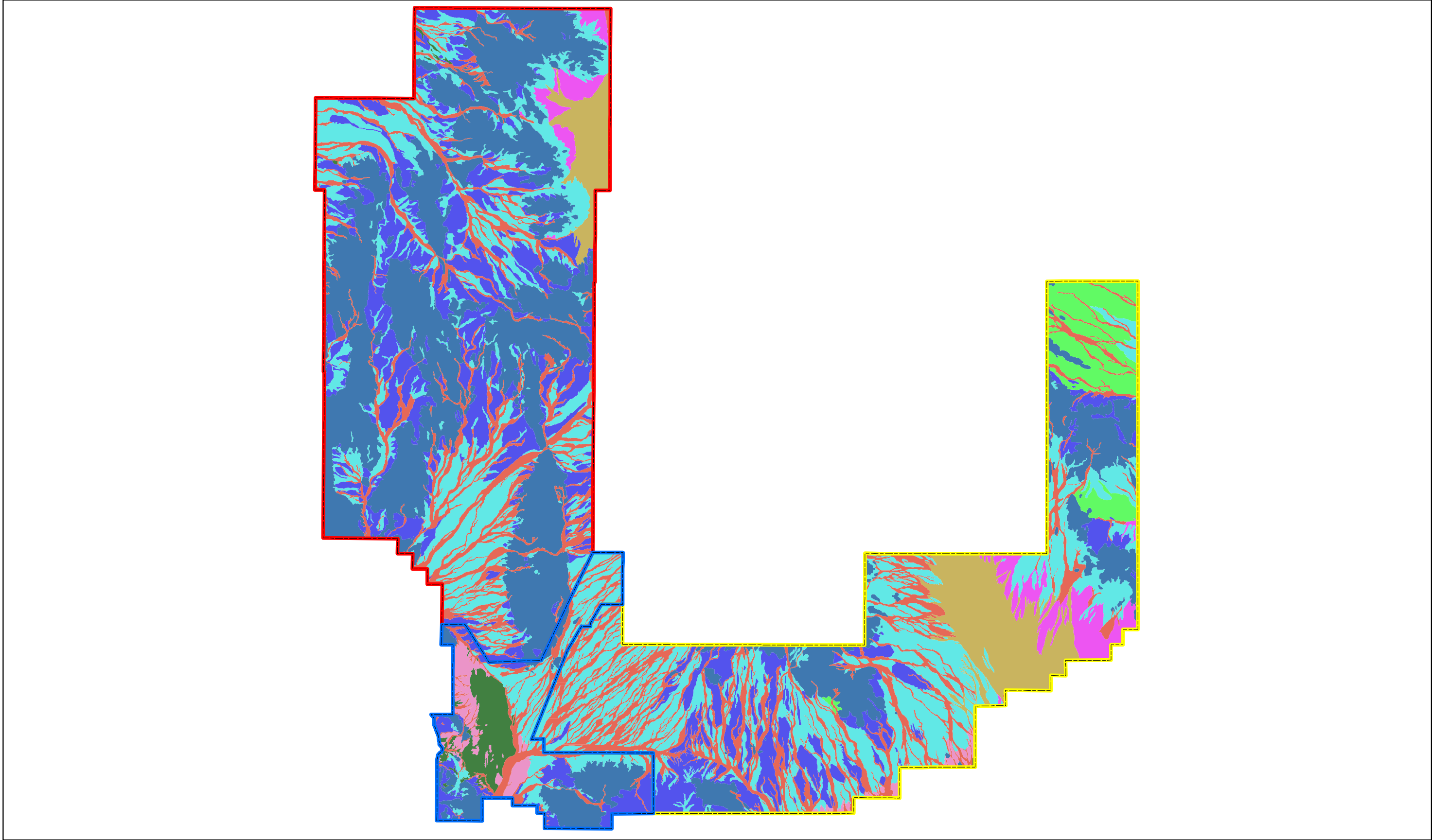


FIGURE 3-4
Soil Map Units
Yuma Proving Ground
Yuma, Arizona

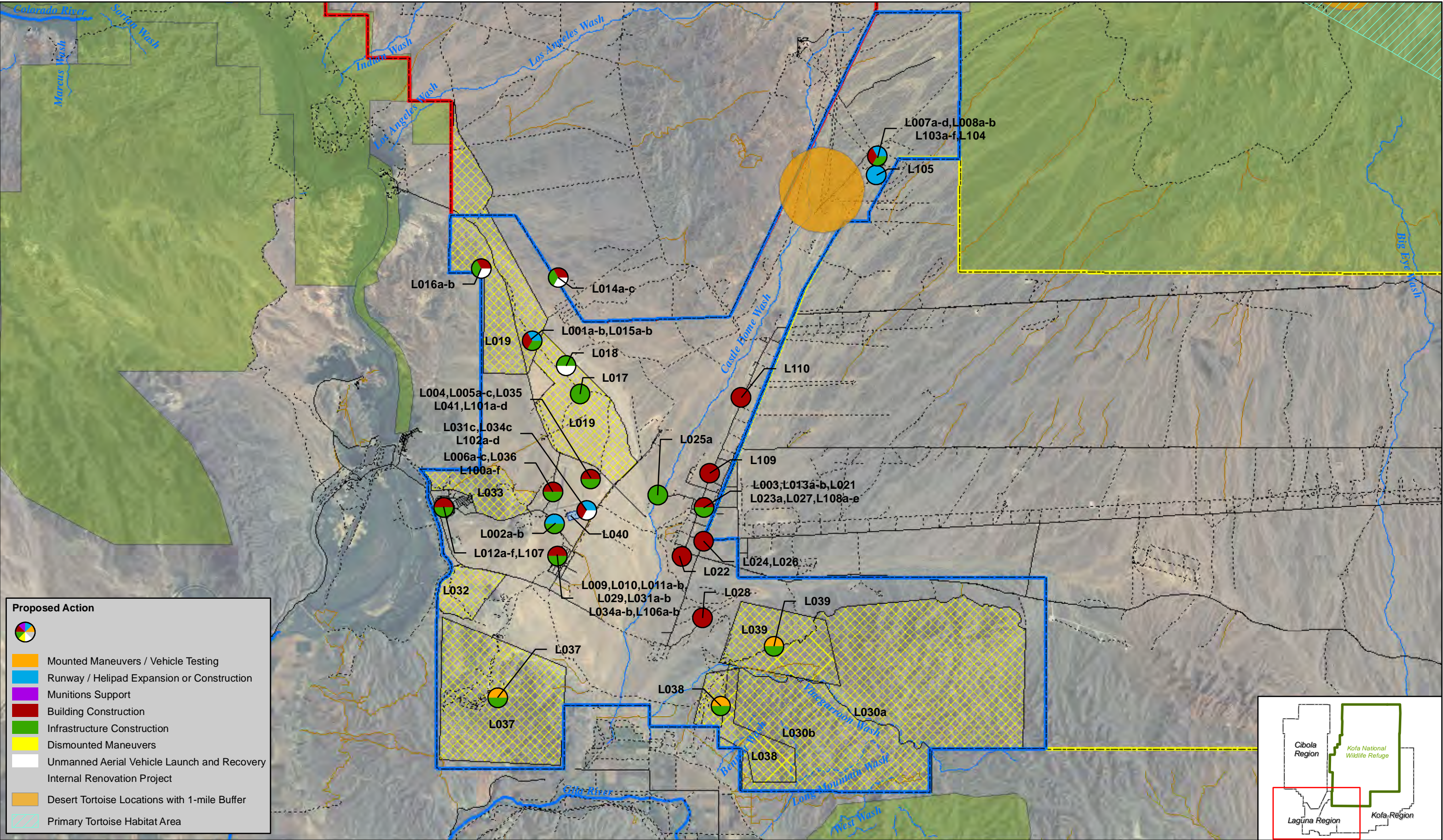


FIGURE 3-5
Desert Tortoise Primary Habitat
Area - Laguna Region
Yuma Proving Ground
Yuma, Arizona

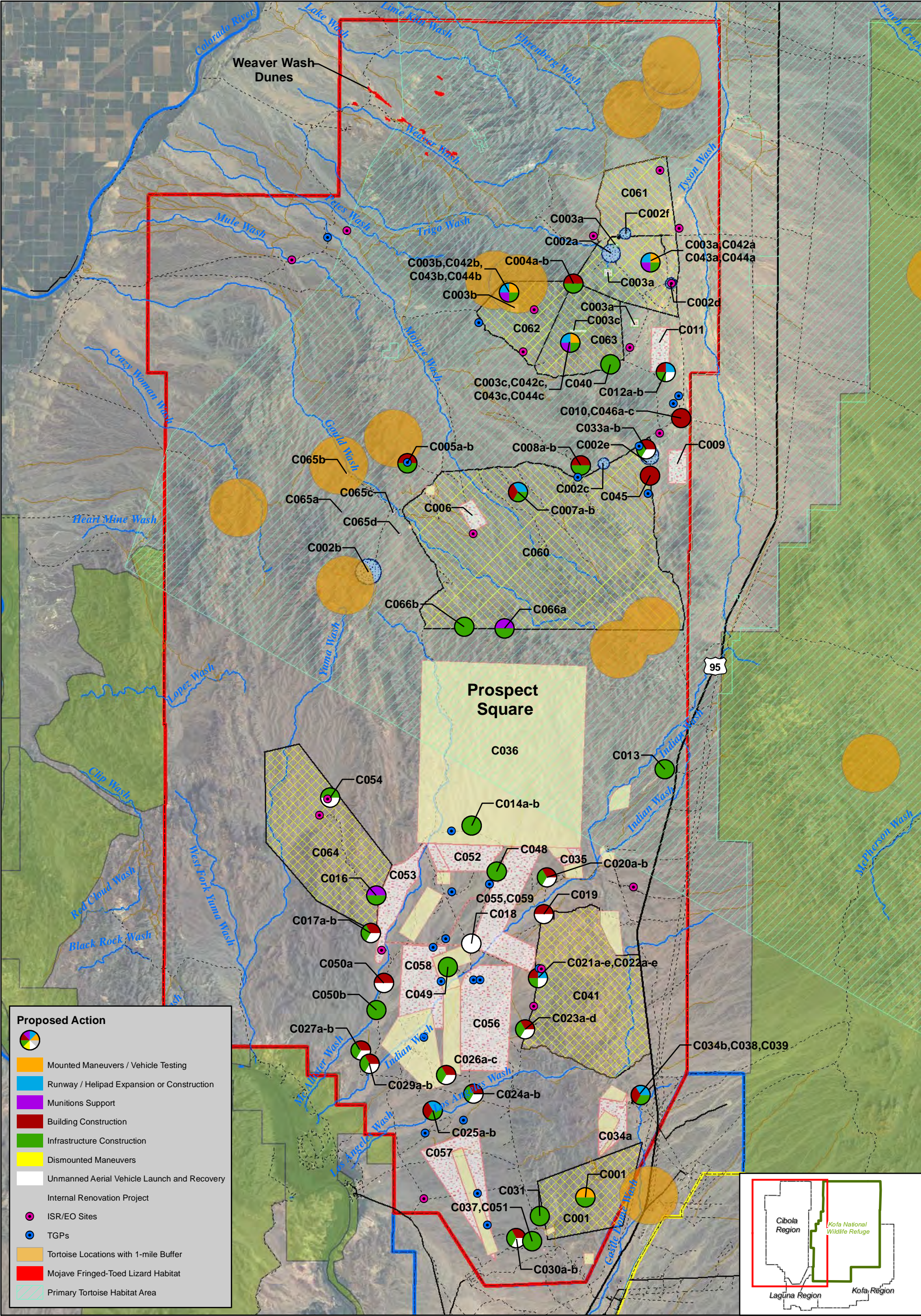
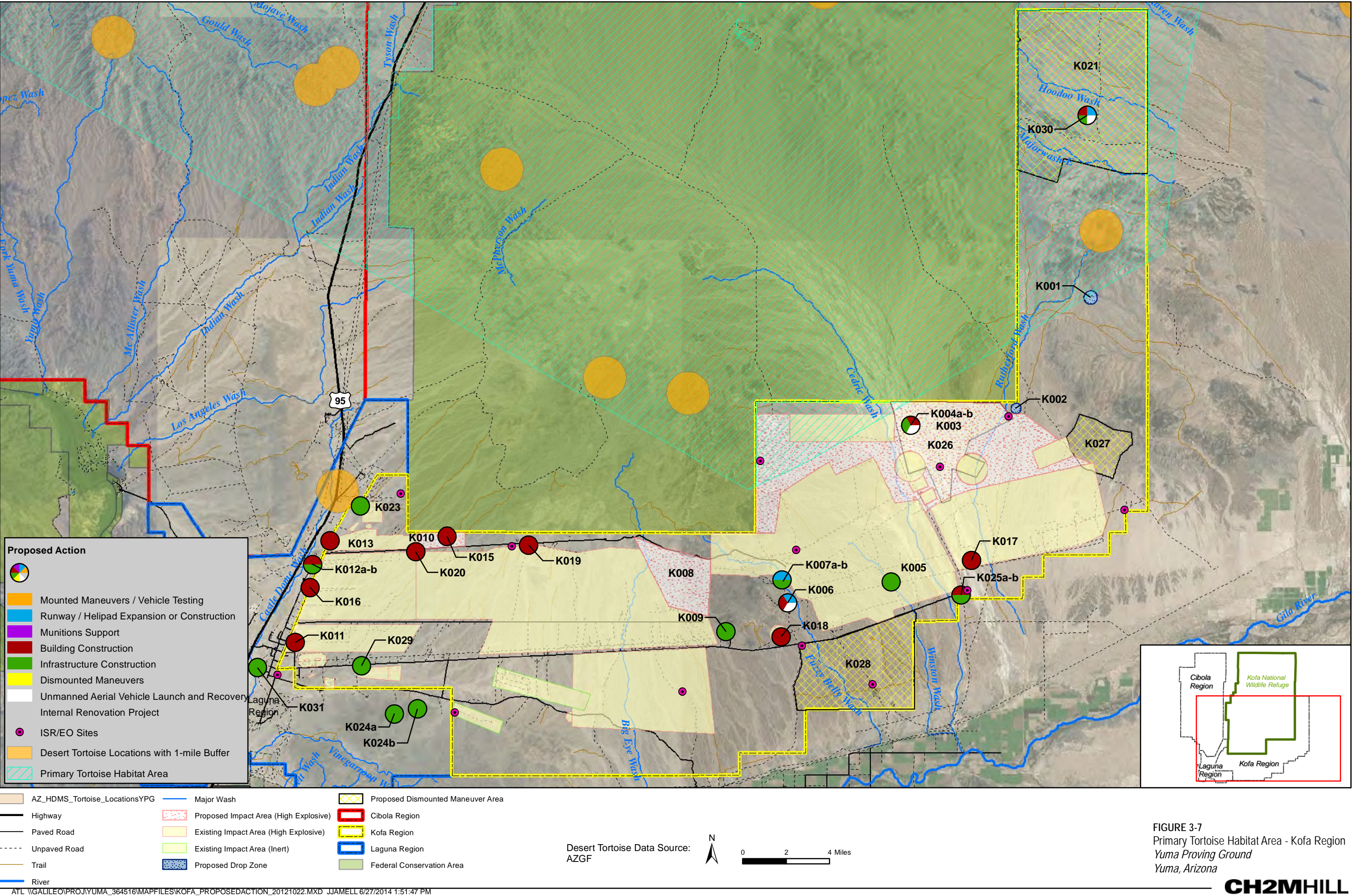


FIGURE 3-6
Desert Tortoise and Mojave Fringed-Toed
Lizard Habitat - Cibola Region
Yuma Proving Ground
Yuma, Arizona



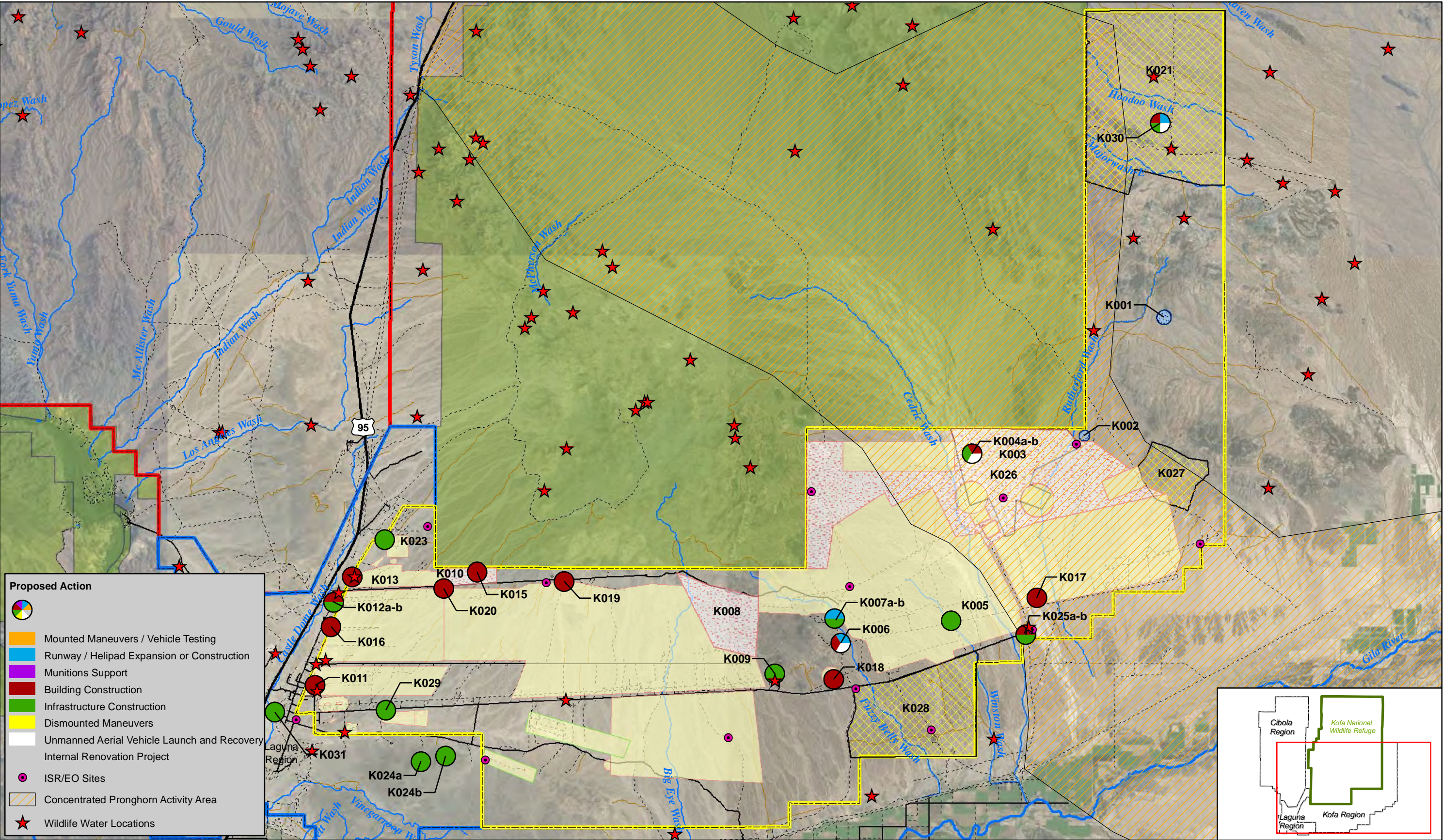


FIGURE 3-8
Pronghorn Antelope Concentrated Activity Area
and Locations - Kofa Region
Yuma Proving Ground
Yuma, Arizona

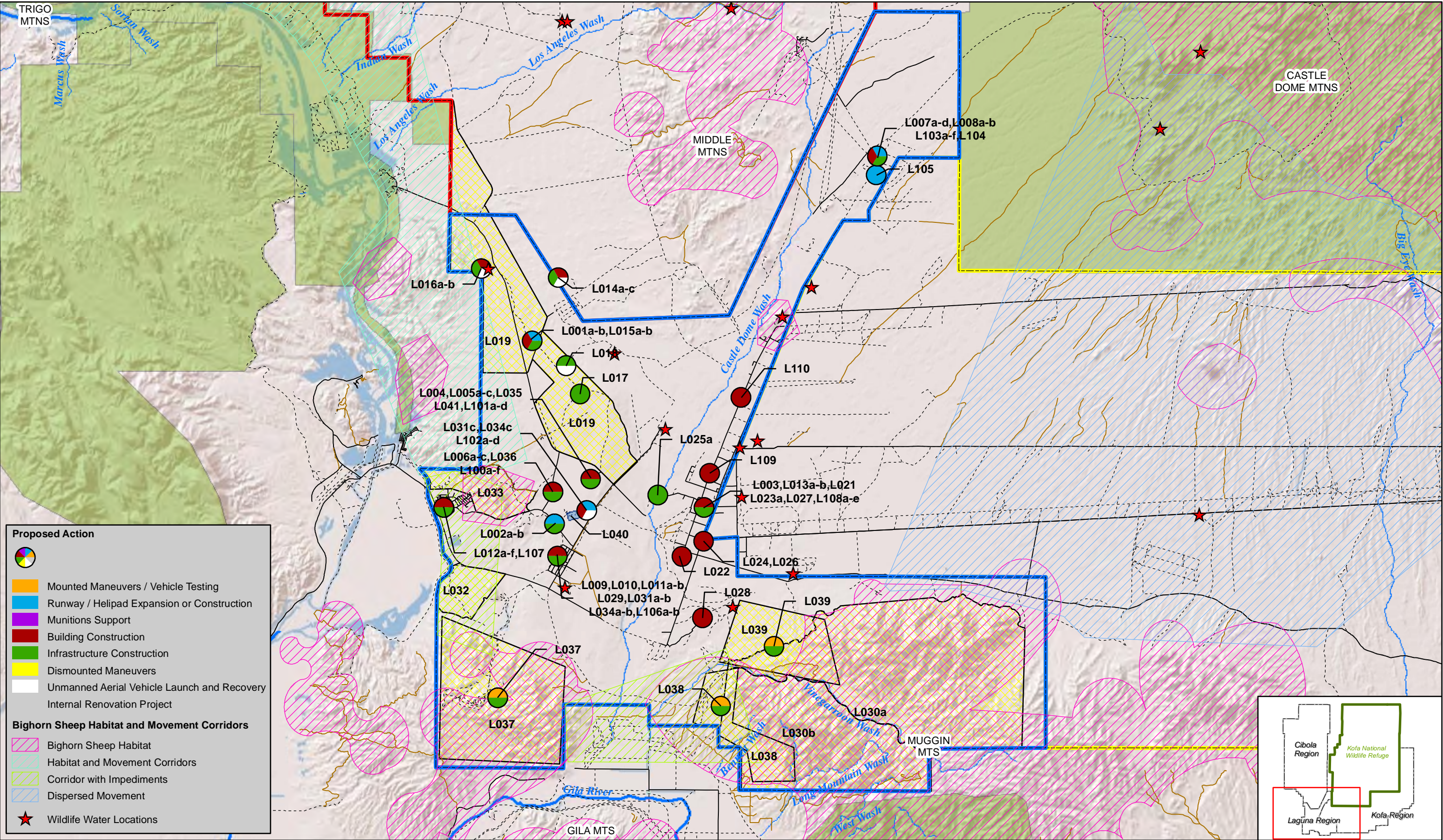
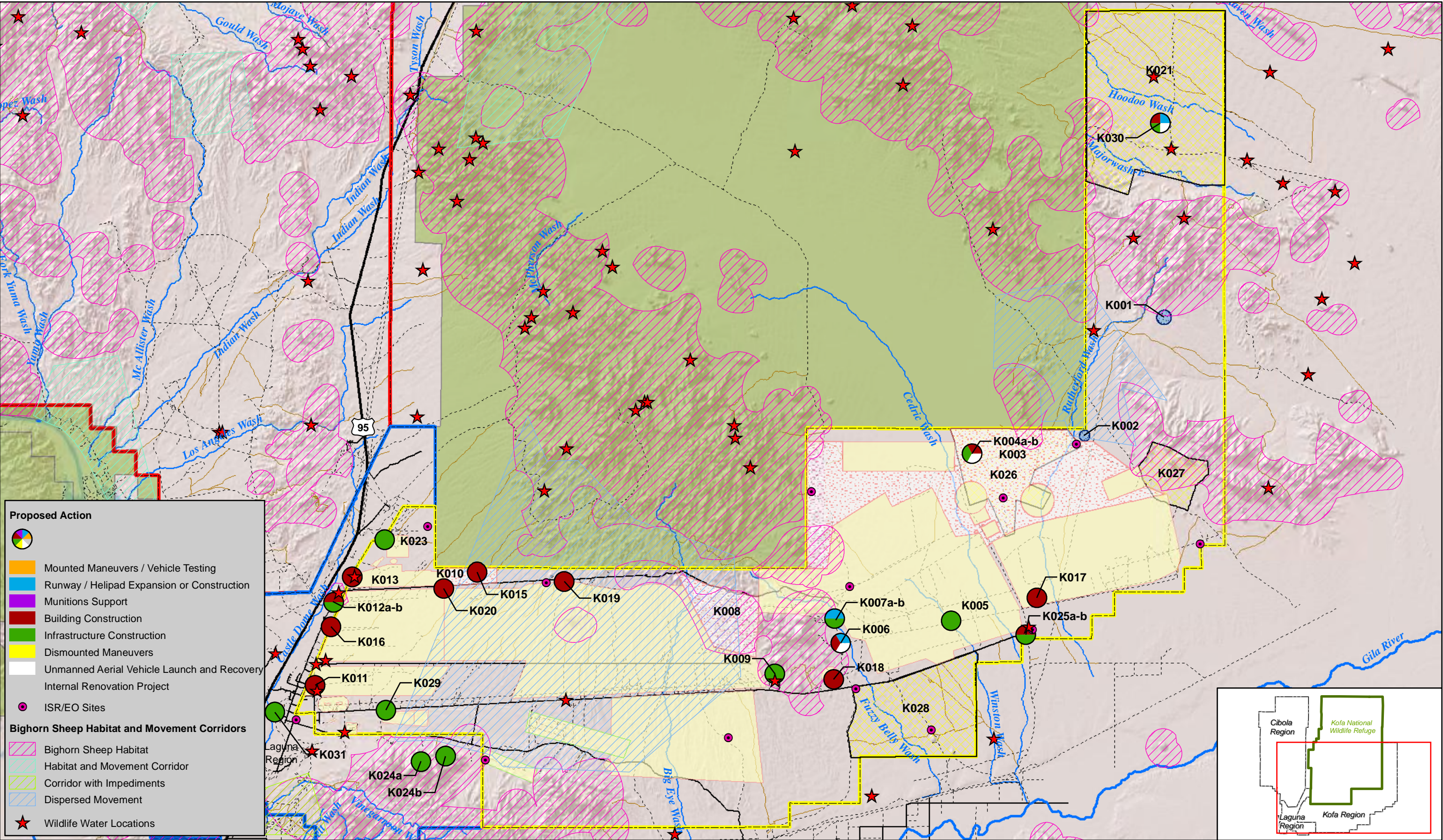


FIGURE 3-9
Bighorn Sheep Concentrated
Activity Areas - Laguna Region
Yuma Proving Ground
Yuma, Arizona



Bighorn Sheep Data Source:
INRMP, 2012

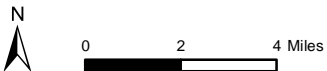


FIGURE 3-11
Bighorn Sheep Concentrated Activity Area
and Locations - Kofa Region
Yuma Proving Ground
Yuma, Arizona