

Finding of No Significant Impact Construction, Operation, and Maintenance of a Solar Array United States Air Force Academy, Colorado

Proposed Action: The United States Air Force Academy (USAFA) is proposing to allow the construction, operation, and maintenance of an up to 8-MW solar array within the secure boundary of the USAFA property. The final array size (up to 8-MW) would depend on final cost and available technology. The solar array would consist of a collection of photovoltaic modules that are made up of multiple interconnected solar cells. The solar cells convert solar energy into direct current (DC) power. The DC power is converted to alternating current (AC) via a device called an inverter.

Purpose and Need: The purpose of the Proposed Action is to construct, operate, and maintain a solar array that would provide the USAFA with up to 14 percent of its total electricity, and decrease the USAFA's reliance on nonrenewable energy sources. The need for the Proposed Action is to support the Energy Policy Act, increase overall United States Air Force's renewable energy use, and allow the USAFA to begin meeting the Department of Defense installation energy policy long-range goal for renewable energy use, and move the USAFA toward becoming a net-zero electricity installation.

Alternatives Considered: Three alternatives were considered and analyzed in the Environmental Assessment (EA). Along with the No Action Alternative, Alternative 2 and Alternative 3 (the USAFA's Preferred Alternative), were analyzed in detail. In Alternative 2, the solar array would be constructed northwest of the Interquest Parkway/I-25 interchange. In Alternative 3, the proposed solar array would be north of South Gate Boulevard, south of Kettle Creek, east of Road 840, and west of I-25. Both alternatives would require construction of a new access road and an underground electrical tie-in to USAFA's existing electrical infrastructure.

One alternative was considered but eliminated from detailed analysis. A description of this alternative and the justification for its elimination is discussed in the EA.

Summary of Findings for the Preferred Alternative: Environmental analyses indicated that the Preferred Alternative would not result in either short- or long-term impacts to geology and soils, air quality, noise, recreation, safety, socioeconomics, environmental justice, or energy.

The EA discloses the potential effects on the following resources or values of concern: Air Installation Compatible Use Zones, future land use, solid waste or biosolids application sites, vegetation and noxious weeds, wetlands and riparian areas, wildlife, water resources, and cultural resources.

Air Installation Compatible Use Zones. The array site and associated access roads would be outside the Clear Zone and Accident Potential Zones I and II. Trenching for the electrical tie-in along South Gate Boulevard would be within Accident Potential Zone I. The Preferred Alternative would not impact the Air Installation Compatible Use Zones.

Future Land Use. In the USAFA's Preferred Alternative, the array site and associated access roads would be within an area designated by the USAFA as Open Space (Preserved Natural), which would require a change to the future land use plan. Future land use would change from the present direction for uses listed under Open Space (Preserved Natural) to Industrial. The electrical tie-in would be compatible with the future land use plan. Although there would need to be a change to the land use plan, the impact would not be significant.

Solid Waste or Biosolids Application Sites. The array site, associated access roads, and electrical tie-in in USAFA's Preferred Alternative would be outside of any known Environmental Restoration Program sites. No effects would be expected for the Preferred Alternative.

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14. ABSTRACT The USAF A prepared this EA to assess the potential environmental effects resulting from construction, operation, and maintenance of a solar array within the secure boundary of the USAF A. This EA analyzes the potential environmental impacts from proposed activities on the Air Installation Compatible Use Zone, future land use, solid waste or biosolids application sites, vegetation, noxious weeds, wetlands and riparian areas, wildlife, water resources and cultural resources. This EA also analyzes cumulative impacts of the Proposed Action.					
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Vegetation. The USAFA's Preferred Alternative would result in the permanent loss of 70.5 acres of upland grassland community, 15.4 acres of tree plantation, and 0.1 acre of developed/disturbed lands. For the area east of Monument Creek at the USAFA, these permanent losses would represent 2.6 percent of the upland grassland community, 9.9 percent of the tree plantation community, and less than 1 percent of developed/disturbed lands. The loss of the upland grassland community and developed/disturbed lands would be insignificant. Based on the condition (i.e., even-aged and poor tree vigor) of the tree plantation, the loss also would be insignificant. Trenching for the electrical tie-in conduit would occur mostly adjacent to existing roadways. Following conduit placement, disturbed areas would be revegetated per USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees*. Impacts from trenching would be temporary and insignificant.

Noxious Weeds. Ground disturbance associated with the construction of the Preferred Alternative would increase the potential for noxious weeds to spread into the area. Methods for prevention and noxious weed management as outlined in the Integrated Noxious Weed Management Plan would be implemented during construction and maintenance activities. Impacts of the Preferred Alternative would not be significant.

Wetlands and Riparian Areas. The Preferred Alternative would not permanently or temporarily impact any wetlands or riparian areas.

Wildlife. The permanent loss of upland grassland and former tree plantation habitats would impact species with smaller home ranges, such as reptiles and small mammals. The permanent loss of these habitats would decrease bird populations and species diversity in the project area. Ground-nesting bird species requiring large areas of grassland would be most affected by habitat loss. The loss of upland grassland habitat, tree plantation habitat, and developed/disturbed areas would be insignificant. Some of these impacts would be offset by suitable habitat adjacent to the project area. Recommendations outlined in the Integrated Natural Resource Management Plan would be followed. Noise, vehicle use, and other human activities associated with operations and maintenance could result in habitat avoidance or could disrupt behavior important to the survival and reproduction of some wildlife species. The Preferred Alternative would not affect any threatened or endangered species.

Water Resources. Rates of stormwater runoff after construction would be the same as existing rates. Impacts on water resources would be insignificant for the Preferred Alternative. The Preferred Alternative would not affect ground water resources.

Cultural Resources. The Preferred Alternative would have no effect on historic properties.

Cumulative Impacts: The EA reviewed cumulative impacts that could result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts that would result from the Preferred Alternative would not be significant.

Mitigation: The USAFA will incorporate the following mitigation measures and Best Management Practices into the project design to reduce environmental impacts. Construction specifications developed during final design will include detailed requirements for implementing these measures. Construction-related mitigation measures, as required are:

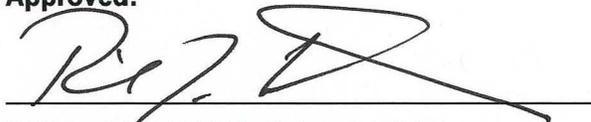
- Silt fences will be used to protect wetlands and other sensitive sites.
- Construction staging areas will be limited to areas of disturbance.
- Equipment will not be serviced or refueled near streams, and all chemicals and petroleum products will be stored and contained away from water sources.
- All hazardous material use will require contractor compliance with applicable federal and state laws.
- All solid waste generated during construction will be removed by the contractor and disposed of at an appropriate disposal facility outside of the USAFA.

- Vehicle traffic will be managed within the construction zone and contractor hauling of materials, supplies, and equipment will be controlled.
- Should any cultural resources, other than those previously recorded, be uncovered during construction, work will stop and the site will be evaluated prior to continuing the project.
- Methods for prevention and noxious weed management described in the Integrated Noxious Weed Management Plan will be implemented during and following construction by the owner and operator of the solar array. The site will be monitored following construction to manage potential infestations.
- Areas of removed vegetation will be revegetated where practicable according to the USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees* or will be graded and have weed barrier covered with rock applied.
- A Stormwater Pollution Prevention Plan will be prepared and a Notice of Intent will be filed with the EPA for coverage under EPA's National Pollutant Discharge Elimination General Permit for Stormwater Discharges from Construction Activities.
- An Air Pollutant Emission Notice for fugitive dust during construction will be submitted to the Colorado Department of Public Health and Environment if required.
- The USAFA will adhere to the terms and conditions of the Preble's meadow jumping mouse Conservation Agreement and any consultation required under the Endangered Species Act.
- Surveys for nesting birds will be conducted in areas proposed for disturbance, and, if active nests are identified in the disturbance area, ground-disturbing activities will be delayed until the nesting and fledging process is complete, or alternatively, a Depredation Permit will be obtained from the U.S. Fish and Wildlife Service.

Decision: Based on the EA conducted in accordance with the National Environmental Policy Act, the Council on Environmental Quality regulations and the U.S. Air Force's implementing regulations (32 CFR 989), it is concluded that, with incorporation of Best Management Practices for resources and specific regulatory permit requirements, the environmental effects of the proposed construction, operation, and maintenance of a solar array are not significant and that preparation of an environmental impact statement is not warranted. For these reasons, a finding of no significant impact is made. An EA, dated April 13, 2010, is hereby incorporated by reference, and is on file at the 10th Civil Engineer Squadron, Environmental Flight, 8120 Edgerton Drive, Suite 40, U.S. Air Force Academy, Colorado 80840 ATTN: Environmental Planner.



Approved:



RICK J. LOCASTRO, Colonel, USAF
Commander, 10th Air Base Wing

21 Apr 10

Date

ENVIRONMENTAL ASSESSMENT

CONSTRUCTION, OPERATION, AND MAINTENANCE

OF A

SOLAR ARRAY

UNITED STATES AIR FORCE ACADEMY, COLORADO



USAFA 10 CES/CECP
8120 Edgerton Drive
United States Air Force Academy, CO 80840

April 13, 2010

Cover Sheet
Environmental Assessment
Construction, Operation, and Maintenance of a Solar Array
United States Air Force Academy, Colorado

Responsible Agency: Department of the Air Force

Proposed Action: Approval of the construction, operation, and maintenance of a solar array of up to 8 megawatts (MW) and associated interconnection within the secure boundary of the United States Air Force Academy (USAFA).

Report Designation: Environmental Assessment (EA)

Abstract: The USAFA prepared this EA to assess the potential environmental effects resulting from construction, operation, and maintenance of a solar array within the secure boundary of the USAFA.

This EA analyzes the potential environmental impacts from proposed activities on the Air Installation Compatible Use Zone, future land use, solid waste or biosolids application sites, vegetation, noxious weeds, wetlands and riparian areas, wildlife, water resources, and cultural resources. This EA also analyzes cumulative impacts of the Proposed Action.

Comments: Written comments regarding this EA should be directed to:

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Privacy Advisory: As required by law, comments will be addressed in the Final EA and will be made available to the public. Due to privacy requirements, only the names of the individuals making the comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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LIST OF ABBREVIATIONS AND ACRONYMS

AC	Alternating current
AFI	Air Force Instruction
ARRA	American Recovery and Reinvestment Act
bgs	below ground surface
BMP	Best Management Practices
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council of Environmental Quality
CNHP	Colorado Natural Heritage Program
CO SHPO	Colorado State Historic Preservation Office
DC	Direct current
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPACT	Energy Policy Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
INRMP	Integrated Natural Resource Management Plan
INWMP	Integrated Noxious Weed Management Plan
MBTA	Migratory Bird Treaty Act
MW	Megawatt
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination General Permit
NRHP	National Register of Historic Places
Preble's	Preble's meadow jumping mouse
USAFA	United States Air Force Academy
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
Utilities	Colorado Springs Utilities

Chapter 1. Purpose and Need

1.1 Introduction

The United States Air Force Academy (USAFA) is proposing to allow the construction, operation, and maintenance of an up to 8-MW solar array within the secure boundary of the USAFA property. The final array size (up to 8-MW) would depend on final cost and available technology. The solar array would consist of a collection of photovoltaic modules that are made up of multiple interconnected solar cells. The solar cells convert solar energy, in the form of visible and invisible radiation from the sun, into direct current (DC) power. The DC power is converted to alternating current (AC) via a device called an inverter.

1.2 Background

Cost and demand for energy produced through nonrenewable resources, such as crude oil, have increased in recent years. In response to the increased energy demand, Congress passed the Energy Policy Act (EPACT) in 2005. One of EPACT's goals is to increase the federal government's total renewable energy use, based on the following targets:

- Not less than 3.0 percent in 2007 through 2009
- Not less than 5.0 percent in 2010 through 2012
- Not less than 7.5 percent in 2013 and each year thereafter

Solar power is one of the renewable energy sources promoted in the EPACT. In addition to the EPACT, Executive Order (EO) 13423 requires that federal agencies ensure that:

- At least half of the statutorily required renewable energy consumed by the agency in a fiscal year comes from new renewable sources, and
- To the extent feasible, the agency implements renewable energy generation projects on agency property for agency use.

It is the policy of the United States Air Force (USAF) to consider energy conservation and alternative energy in all of its activities. In 2008, the USAF purchased more than 899 million kilowatt-hours of renewable energy, establishing the USAF as the top federal government buyer of renewable energy. The USAF ranks among the largest buyers on the U.S. Environmental Protection Agency's (EPA) National Top 25 list, and the top federal government buyer of renewable power in the Green Power Partnership (EPA 2009a).

Currently, 5 percent of all electricity used by the USAF is produced from renewable sources, which surpasses the EPACT mandates by 2 percent (EPA 2009b). The Department of Defense (DoD) indicated in a memorandum that each DoD component should strive aggressively to expand use of renewable energy to 25 percent by 2025. In addition, the United States Air Force Academy (USAFA) Energy and Facility Management Policy lists as one of its objectives that the USAFA become a net-zero electricity installation (i.e., zero net energy consumption and zero carbon emissions annually) by 2015.

The City of Colorado Springs borders the 18,000-acre USAFA to the south and east (Figure 1). Most of the electrical power used by USAFA is provided by Colorado Springs Utilities (Utilities), the utility that provides electricity, natural gas, water, and wastewater services to Colorado Springs. About 94 percent of Utilities' generation capacity is fueled by nonrenewable resources (Utilities 2008).

1.3 Purpose and Need

The purpose of the Proposed Action is to construct, operate, and maintain a solar array that would provide the USAFA with up to 14 percent of its total electricity, and decrease the USAFA's reliance on nonrenewable energy sources. The need for the Proposed Action is to support the EPACT, increase overall USAF renewable energy use, allow the USAFA to begin meeting the DoD installation energy policy long-range goal for renewable energy use, and move the USAFA toward becoming a net-zero electricity installation.

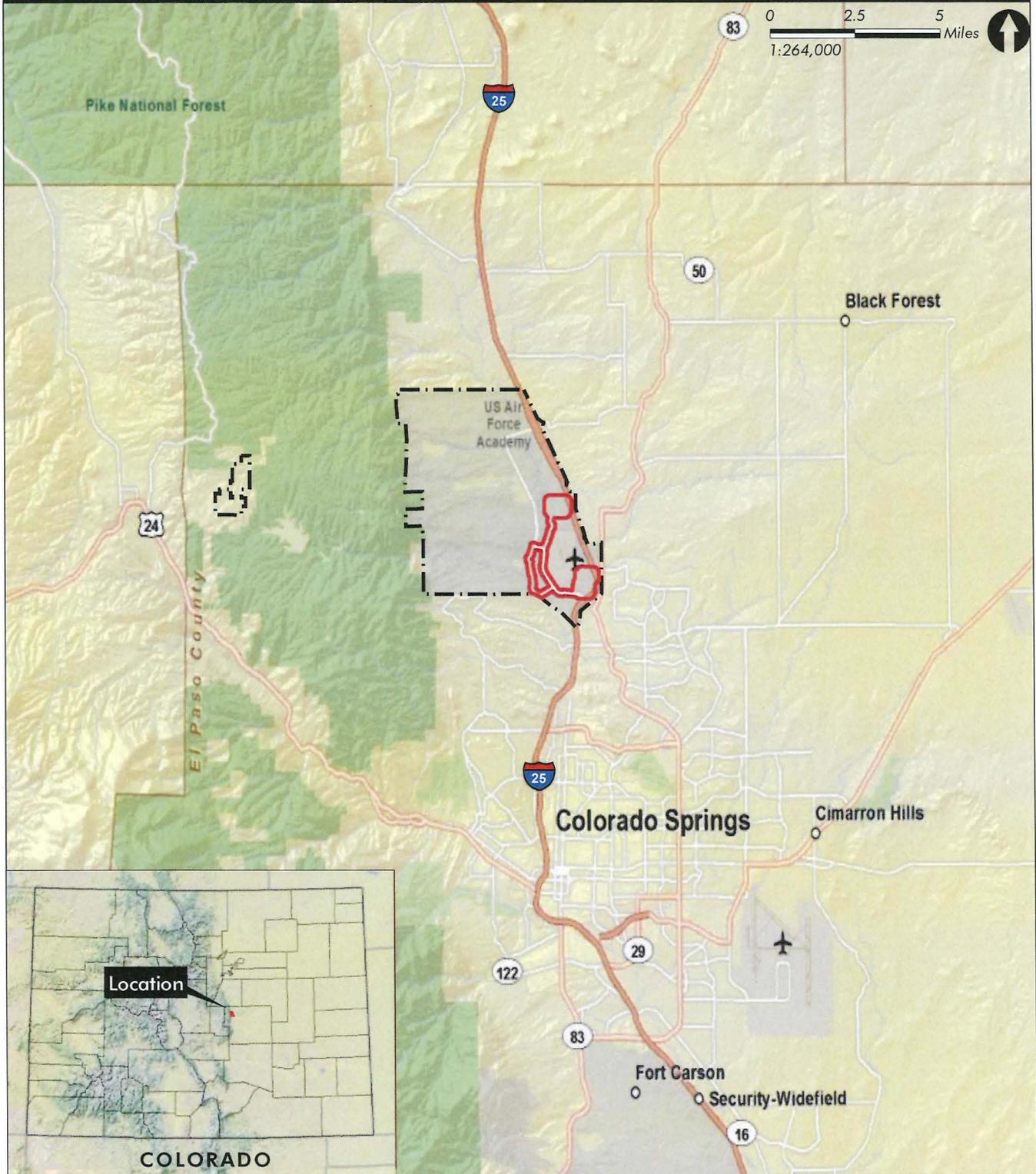
1.4 Scope of the Environmental Assessment

The USAFA has prepared this Environmental Assessment (EA) to assess the potential environmental effects resulting from construction and operation of a solar array system within the USAFA boundaries. This environmental analysis has been conducted in accordance with the President's Council on Environmental Quality (CEQ) regulations, 40 CFR 1500-1508, as they implement the requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. 4321, et seq.; and Air Force Instruction (AFI) 32-7061, the Environmental Impact Analysis Process (32 CFR Part 989). Title 32 CFR 989 addresses the USAF's implementation of NEPA and directs USAF officials to consider environmental consequences as part of the planning and decision-making process. These regulations require federal agencies to analyze the potential environmental impacts of the Proposed Action and alternatives, and to use these analyses in making decisions on a Proposed Action. Cumulative effects of other ongoing activities also must be assessed in combination with the Proposed Action. The CEQ regulations state that an EA is required to accomplish the following objectives:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).
- Aid in an agency's compliance with NEPA when an EIS is not necessary, and facilitate preparation of an EIS when necessary.

AFI 32-7061, as promulgated in 32 CFR 989, specifies procedural requirements for the implementation of NEPA and preparation of the EA. This EA also identifies other environmental regulatory requirements relevant to the Proposed Action and alternatives. Regulatory requirements under the following programs, among others, are assessed: Noise Control Act, Clean Air Act, Clean Water Act, National Historic Preservation Act, Endangered Species Act (ESA), Resource Conservation and Recovery Act, Toxic Substances Control Act, and Occupational Safety and Health Act. Requirements also include compliance with EO 11988, Floodplain Management; EO 11990, Protection of Wetlands; and EO 12898, Environmental Justice.

Figure 1. Location and Vicinity of the U.S. Air Force Academy



LEGEND

 Project Area

This EA evaluates the potential environmental impacts that may result from implementation of the Proposed Action, as well as possible cumulative impacts from other actions planned for the USAFA. This EA also identifies required environmental permits relevant to the Proposed Action. As appropriate, the affected environment and environmental consequences of the Proposed Action may be described in terms of site-specific descriptions or regional overview. Finally, this EA identifies mitigation measures to prevent or minimize environmental impacts, as required.

1.5 Impact Topics Retained for Further Analysis

Impact topics were selected based on the need to evaluate in detail the potential effects to resources or values of concern. Impact topics are the resources or values of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared based on the most relevant topics. The impact topics were identified based on federal laws, regulations, orders, USAF and USAFA policies, and public input. Table 1 discusses the impact topics, the reasons for retaining the topic, and relevant laws, regulations, and policies applicable to the topic.

1.6 Impact Topics Dismissed from Further Consideration

The following impact topics or issues were eliminated from the list of potential impacts because there would be no effects or the effects of the Proposed Action would be insignificant. The rationale for dismissing specific topics from further consideration is provided in each section.

1.6.1 Geology and Soils

The Proposed Action would involve excavation or drilling, and standard Best Management Practices (BMPs) would be implemented to minimize soil erosion during construction activities. Sedimentation patterns would not be notably altered and no structural movements or changes in seismicity would result. Therefore, there would be negligible impacts on geology and soils as a result of implementing the Proposed Action.

1.6.2 Air Quality

During construction, motorized equipment would emit gaseous emissions, and surface disturbance would generate dust. With the implementation of BMPs for fugitive dust, construction of the project would have a negligible impact on air quality. Accordingly, the USAFA has eliminated detailed examination of air quality.

1.6.3 Noise

The Proposed Action would not alter noise levels at the USAFA boundary. Noise would temporarily increase during construction but would not persist following project completion. The solar array would be far from sensitive receptors, such as residences or recreational areas. For these reasons, noise is not evaluated further in this EA.

Table 1. Impact Topics Retained for Further Evaluation and Relevant Laws, Regulations, and Policies.

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, Instructions, and Directives
Air Installation Compatible Use Zone	Alternative 2 array site occurs within Accident Potential Zone II of the USAFA's airfield. The proposed construction access road occurs within the Clear Zone and Accident Potential Zone II.	USAFA Air Installation Compatible Use Zone; UFC3-260-01 Nov 2008
Future Land Use	The solar array would change the future land use designation.	USAFA General Plan; AFI 32-7062, Air Force Comprehensive Planning
Solid Waste or Biosolids Application Sites	Alternative 2 array site and the proposed access road occur within an inactive permitted biosolids application area. The proposed construction access road occurs adjacent to a former landfill.	Colorado Water Quality Control Commission Regulation No. 64 (5 CCR 1002-64)
Vegetation and Noxious Weeds	Vegetation clearing would be required for the proposed solar array, including the loss of native vegetation. Ground disturbance would create a more vulnerable environment, increasing the likelihood of invasive nonnative plants becoming established.	Noxious Weed Control Act; Executive Order 13112, Exotic and Invasive Species; AFD 32-70, Environmental Quality; AFI 32-1053, Pest Management Program
Wetlands and Riparian Areas	Alternative 2 proposed access road would be adjacent to wetlands and riparian areas.	Clean Water Act; Executive Order 11990, Protection of Wetlands; AFD 32-70, Environmental Quality
Wildlife	Vegetation clearing would be required for the proposed solar array, resulting in the loss of native vegetation and associated wildlife habitat.	Conservation Programs on Military Installations (Sikes Act); Soil and Water Conservation Act; Endangered Species Act (ESA); Migratory Bird Treaty Act (MBTA); Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds; AFD 32-70, Environmental Quality
Water Resources	Additional impervious surface could increase stormwater flows.	Clean Water Act; Executive Order 11990, Protection of Wetlands; Soil and Water Conservation Act
Cultural Resources	A variety of cultural resources occur within the project area, and most have been evaluated for their eligibility in the National Register of Historic Places.	National Historic Preservation Act; DoD Directive 4715.3, Environmental Conservation Program; AFD 32-70, Environmental Quality; AFI 32-7065, Cultural Resources Management Program.

1.6.4 Recreation

Public recreation resources in the project area are limited to the New Santa Fe Trail and the CE Pavilion (i.e., a small picnic area near the Civil Engineering building). The 15-mile New Santa Fe Trail, which extends from the Palmer Lake Recreation Area in northern El Paso County to the City of Colorado Springs, follows a 6.5-mile portion of the abandoned Atchison, Topeka, and Santa Fe railroad line through the USAFA. The CE Pavilion is near the southern terminus of the existing overhead electrical interconnection. Although the recreational experience along the trail or at the CE Pavilion may be temporarily affected, the Proposed Action would not affect these recreational opportunities. Therefore, recreation is not assessed further in this EA.

1.6.5 Safety

The contractor would develop a site-specific health and safety plan for the project. The contractor would safeguard USAFA personnel and the public through signage, security, and compliance with construction permits, as appropriate. Before construction, the contractor would ensure that a USAF Form 103, Base Civil Engineering Work Clearance Request, is coordinated through the USAFA, including the USAFA Safety Office. In addition, flight safety would not be impacted because no part of the Proposed Action would employ or influence airspace operations or air traffic management at or around the USAFA. Accordingly, the USAFA has eliminated detailed analysis of safety in this EA.

1.6.6 Socioeconomics

Funding for construction of the solar array is being provided through the American Recovery and Reinvestment Act (ARRA). The ARRA includes domestic spending in education, health care, and infrastructure, including the energy sector. Local construction crews would be used for construction. The proposed project would not alter socioeconomic factors such as changes in local economic bases, salary levels, land use zoning, plans or programs of other agencies, or a particular socioeconomic group. Although the project would increase short-term employment, no substantial change to economic factors from the proposed construction activities or long-term operation of the solar array would occur. For these reasons, socioeconomics are not assessed further in this EA.

1.6.7 Environmental Justice

Executive Order 12898 requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. None of the alternatives would have disproportionately high, adverse effects on minorities or low-income populations or communities. Consequently, this topic was dismissed from detailed analysis in this EA.

1.6.8 Energy

The Proposed Action would require expenditures of energy, including natural and depletable resources, during construction. However, the energy use would be short-term and have negligible impacts to energy resources, with no appreciable effect on energy

availability or costs. Because impacts would be negligible, energy resources was dismissed as an impact topic in this EA.

1.7 Summary of Key Environmental Compliance Requirements

The Proposed Action may require environmental permits and amendments to existing permits. A Stormwater Pollution Prevention Plan, including sediment- and erosion-control measures, would be prepared and a Notice of Intent would be filed with the EPA for coverage under EPA's National Pollutant Discharge Elimination General Permit for Stormwater Discharges from Construction Activities. An Air Pollutant Emission Notice for fugitive dust during construction would be submitted to the Colorado Department of Public Health and Environment (CDPHE) if required. The contractor would be responsible for ensuring that applicable permits are identified and obtained from base, local, state, and federal agencies.

1.8 Decision Process

An EA analyzes the proposed project alternatives and the impacts on the environment, cultural, and socioeconomic resources. This EA has been prepared in accordance with NEPA and regulations of the CEQ (40 CFR 1508.9). The EA will be released to the public, and there will be a public comment period of 30 days. The USAFA will determine whether the environmental consequences of the Proposed Action require preparation of an EIS or if a FONSI can be signed by the Commander, 10th Air Base Wing.

Chapter 2. Description of Proposed Action and Alternatives

2.1 Identification of Selection Criteria

The USAFA developed several criteria to compare alternative ways of fulfilling the objectives of the Proposed Action in accordance with 32 CFR 989.8(c). Selection criteria for the solar array site within the boundary of the USAFA are:

- At least 30 acres with expansion capability to 80 acres
- Visible from Interstate 25 (I-25) to demonstrate USAFA's commitment to support renewable energy
- Not affect the flying mission, and minimize the effect on the Clear Zone and Accident Potential Zones I and II
- Minimize effects on Preble's meadow jumping mouse (Preble's) habitat and cultural resource sites
- Minimize tree removal and effects on natural resources
- Near existing electrical distribution/transmission for interconnection
- In a favorable solar insolation area to maximize generation

During the solar array planning process and for public presentation purposes, the USAFA designated three alternative site locations as Alternatives 1, 2, and 3. These alternative numbers are used in this document for consistency and to alleviate confusion for the reader. Alternative 1 was considered but eliminated (Section 2.6).

2.2 Project Area

The project area encompasses areas potentially affected by Proposed Action facilities, such as the alternative site locations, electrical tie-in interconnections, and access roads. To ensure the EA discusses all resources that may be affected by the Proposed Action, a 1,000-foot buffer was added around the array site locations; 500 feet was added on each side of linear features. The project area is shown on all figures in this EA.

2.3 No Action Alternative

In the No Action Alternative, the USAFA would not approve the construction, operation, and maintenance of a solar array and associated interconnection within the secure boundary of the USAFA property. The USAFA would continue to receive all of its electrical power from Utilities, using Utilities' current and future sources of such power. The proposed project site would remain undeveloped for the foreseeable future.

The No Action Alternative is the continuation of existing conditions of the affected environment (without implementation of the Proposed Action). The No Action Alternative serves as a benchmark against which action alternatives can be evaluated. A No Action Alternative is required by CEQ regulations and will be carried forward for further analysis in this EA.

2.4 Alternative 3, USAFA's Preferred Alternative

2.4.1 Array Site

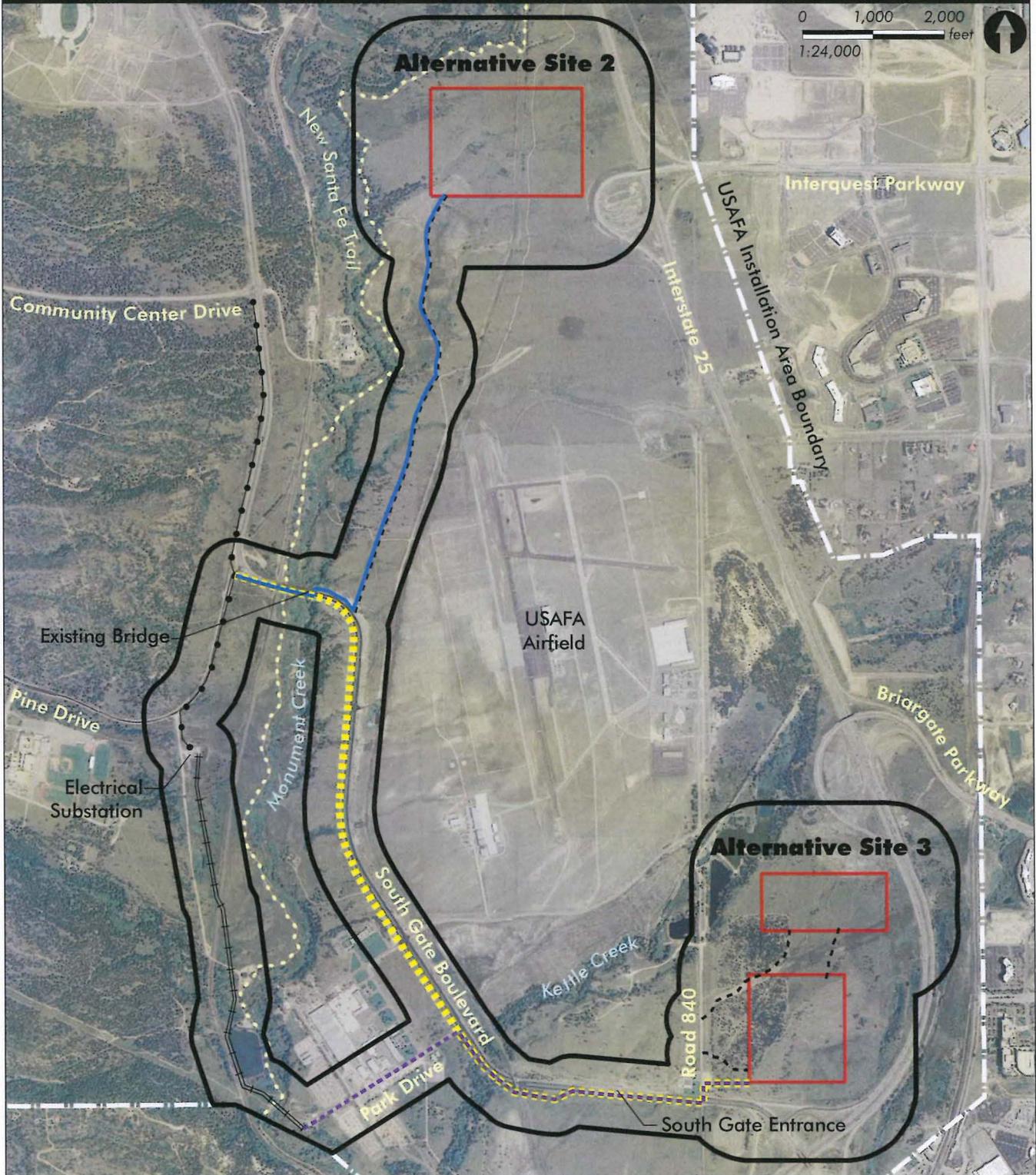
In Alternative 3, Utilities would arrange for an independent company to design, construct, operate, and maintain an up to 8-MW solar array and associated interconnection within the secure boundary of the USAFA property. Utilities would purchase power from the solar array owner-operator through a Power Purchase Agreement or similar contract. A system of up to 8 MW would meet up to 14 percent of the USAFA's total electrical power demands. The proposed solar array would be located north of South Gate Boulevard, south of Kettle Creek, east of Road 840, and west of I-25. The alternative site locations are shown on Figure 2. An array of up to 8 MW would be located on about 80 acres.

During construction, the site would be cleared and grubbed, with topsoil salvaged and used on disturbed areas that would be revegetated where practicable in accordance with USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees* (USAFA 2009). Tree stumps would be removed with heavy equipment. Several thousand holes, 6 to 8 feet deep and 3.5 feet in diameter would be drilled into the soil to position a vertical structural post. The holes would be filled with concrete and a photovoltaic module mounted on each post. The modules would be connected with electrical cabling. Thousands of linear feet of trenching, 4 feet wide by 3.5 feet deep would be cut into the soil for the electrical cabling, then backfilled. Excess soil from hole drilling and trenching would be either used as fill on-site, or removed from the site and disposed of properly. Maintenance roads, surfaced with gravel and designed to accommodate a standard pickup truck, would occur between each subsection of solar panels and comprise about 20 percent of the array site. Stormwater runoff rates following construction would meet the historical, undeveloped runoff rates. A small, climate-controlled shed about 8 feet wide by 10 feet long by 8 feet high would be on-site to store communications equipment. Switchgear, used in association with the electric power system, also would be on site.

Power generated from the solar array would be connected to the USAFA power distribution system. Concrete-encased conduit connecting the solar panel arrays to an electrical interconnection would be placed underground in trenches up to 5 feet deep. Following conduit placement, the trench would be revegetated in accordance with USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees* (USAFA 2009). This solar array site would be designed to accommodate future expansion up to 80 acres in size.

Two new access roads from Road 840 near the south entrance gate (Figure 2) to the solar array site would be constructed. One access road would be about 1,500 feet long and the other access road would be about 750 feet long. Both access roads would be about 30 feet wide and follow existing two-track roads. An additional road segment about 760 feet long and 30 feet wide would connect the two array sites and provide for communication and connection between the two array sites. Construction traffic would average about two trucks per day for 6 months, in addition to dozens of smaller vehicles on a daily basis.

Figure 2. Alternative 2 and 3 Site Location and Electrical Tie-in Options



LEGEND

Project Features

- Solar Array Footprint
- Alternative 2 electrical tie-in
- Alternative 3 electrical tie-in Option 1
- Alternative 3 electrical tie-in Option 2
- - - Proposed Access Road

- ▭ Project Area
- ≡ Existing Overhead Electrical Interconnection
- Existing Underground Electrical Conduit

2.4.2 Electrical Tie-in

A new interconnection for the solar array would convey power to the South Substation that is part of the USAFA electrical distribution system. The USAFA is considering two options to interconnect the solar array to the USAFA's existing distribution system.

Option 1. The proposed interconnection would be mostly trenched underground for about 11,770 feet generally in the right-of-way along South Gate Boulevard, and would tie in with an existing underground conduit at the end of Pine Drive (Figure 2). The trench would be up to 5 feet deep. A short length of the interconnection would be bored under a segment of abandoned grade of the Santa Fe Railroad. The electrical tie-in would pass through a new conduit attached beneath the bridge that crosses Monument Creek.

Option 2, USAFA's Preferred Option. The proposed interconnection would follow the same alignment and construction technique as Option 1 to the intersection with Park Drive (Figure 2). The proposed interconnection would then follow Park Drive underground southwest for about 2,580 feet and tie in with an existing overhead interconnection. The existing 34.5-kV overhead distribution line that feeds the South Substation would be re-wired, so that two 34.5-kV circuits would be combined into one 34.5-kV circuit. The overhead portion of the 12.5-kV interconnection from the solar array would occupy the pole space of one of the 34.5-kV circuits that were combined on the existing utility poles. Combining the 34.5-kV circuits and installing the new 12.5-kV circuit would require visiting each pole about six times with a bucket truck and a 2.5-ton utility truck along an existing two-track road. There would be no new ground disturbance along the existing overhead interconnection right-of-way.

2.4.3 Operations and Maintenance

After initial construction, the solar array is expected to operate for many years with little maintenance or intervention. The solar array would be located in an area that would be clear of shade and debris. Solar panels would be cleaned periodically as needed. If the solar panels became covered with snow, they would stop producing power, but snow would generally melt quickly. To resume operation immediately after a snow event with accumulation on the solar panels, snow would have to be cleaned off the solar panels.

Vehicles involved in operations and maintenance could potentially introduce or spread noxious weeds. Methods for prevention and noxious weed management described in the *Integrated Noxious Weed Management Plan* (Land Stewardship Consulting, Inc. 2004) would be implemented by the owner and operator of the solar array.

2.5 Alternative 2

2.5.1 Array Site

Alternative 2 is the same as Alternative 3 in terms of the size, scope, and mitigation measures that would be included in the project design. In Alternative 2, the solar array would be constructed northwest of the Interquest Parkway/I-25 interchange. The array site would be partly in Accident Potential Zone I and partly in Accident Potential Zone II. A portion of the array site has been used historically to land apply biosolids, or treated sludge, from USAFA's wastewater treatment plant. A new access road from South Gate

Boulevard to the solar array site would be constructed. The access road would be about 6,330 feet long and 30 feet wide. The access road would be partially in the Clear Zone of the airfield and partially in Accident Potential Zone I. A culvert may be needed at a drainage crossing. Stormwater management would be the same as Alternative 3.

2.5.2 Electrical Tie-in

The proposed interconnection would be trenched underground under the new access road for about 6,330 feet to the intersection with South Gate Boulevard. The underground line would then continue west for about 1,820 feet and tie in with an existing underground conduit at the end of Pine Drive (Figure 2). The line would pass through a new conduit attached beneath the bridge that crosses Monument Creek.

2.5.3 Operations and Maintenance

Operations and maintenance for the solar array in Alternative 2 are the same as those in Alternative 3.

2.6 Alternatives Considered but Eliminated

One alternative location was considered for construction and operation of the solar array. The alternative site is about 1.4 miles south of the I-25/North Gate Boulevard interchange between Monument Creek and the New Santa Fe Trail (Figure 3). Existing site access is limited, and the New Santa Fe Trail, a popular recreational trail, would be used for access. The site slopes to the west, away from I-25. Due to the potential impacts of construction access along the New Santa Fe Trail, limited visibility from I-25, and the lack of expansion potential, this site was eliminated from detailed analysis.

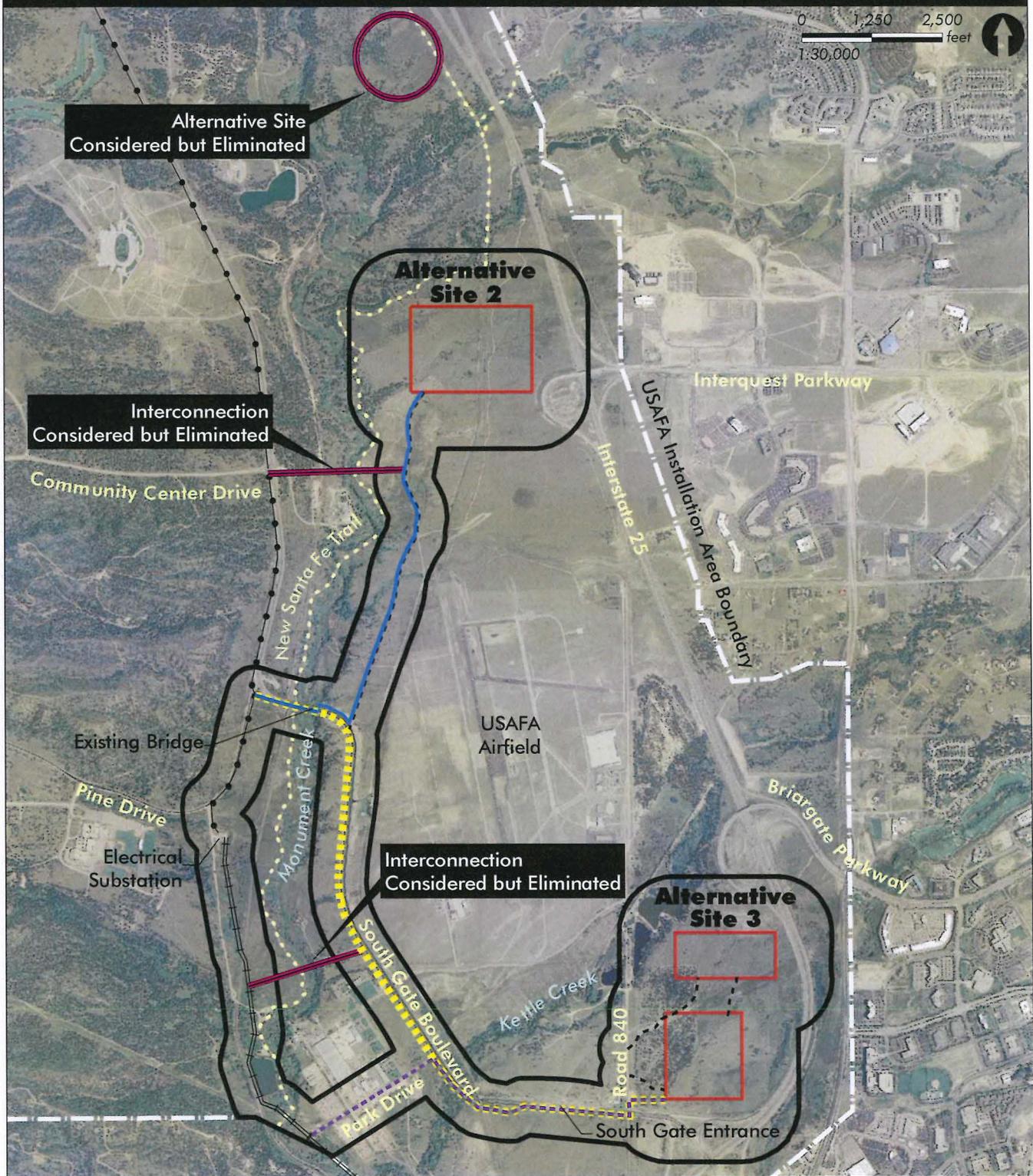
An electrical tie-in option of partly underground and partly overhead interconnection was also considered for Alternatives 2 and 3 (Figure 3). The overhead portion of the interconnection would be constructed to span Monument Creek. Preble's habitat is found along the entire reach of Monument Creek on the USAFA. This electrical tie-in option was eliminated from detailed analysis for both alternative sites due to the potential impacts of vegetation clearing for construction and the impacts to Preble's habitat and required future access for maintenance.

2.7 Mitigation Measures

Utilities would incorporate the following mitigation measures and BMPs into the project design to reduce environmental impacts. Construction specifications developed during final design would include detailed requirements for implementing these measures. Construction-related mitigation measures, would be:

- Silt fences would be used to protect wetlands and other sensitive sites.
- Construction staging areas would be limited to areas of disturbance.
- Equipment would not be serviced or refueled near streams, and all chemicals and petroleum products would be stored and contained away from water sources.

Figure 3. Alternatives Considered but Eliminated



LEGEND

- | | |
|--|--|
| Project Features | Project Area |
| Solar Array Footprint | Existing Overhead Electrical Interconnection |
| Alternative 2 electrical tie-in | Existing Underground Electrical Conduit |
| Alternative 3 electrical tie-in Option 1 | |
| Alternative 3 electrical tie-in Option 2 | |
| Proposed Access Road | |

- All hazardous material use would require contractor compliance with applicable federal and state laws.
- All solid waste generated during construction would be removed by the contractor and disposed of at an appropriate disposal facility outside of the USAFA.
- Vehicle traffic would be managed within the construction zone; and contractor hauling of materials, supplies, and equipment would be controlled.
- Should any cultural resources, other than those previously recorded, be uncovered during construction, work would stop and the site would be evaluated prior to continuing the project.
- Methods for prevention and noxious weed management described in the *Integrated Noxious Weed Management Plan* (Land Stewardship Consulting, Inc. 2004) would be implemented during and following construction by the owner and operator of the solar array. The site would be monitored following construction to manage potential infestations.
- Areas of removed vegetation would be revegetated where practicable according to the USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees* (USAFA 2009).
- A Stormwater Pollution Prevention Plan would be prepared and a Notice of Intent would be filed with the EPA for coverage under EPA's NPDES General Permit for Stormwater Discharges from Construction Activities #COR10000F.
- An Air Pollutant Emission Notice would be submitted to the CDPHE if required.
- The USAFA would adhere to the terms and conditions of the Preble's Conservation Agreement (USFWS 2009) and any consultation required under the ESA.
- Surveys for nesting birds would be conducted in areas proposed for disturbance, and, if active nests are identified in the disturbance area, ground-disturbing activities would be delayed until the nesting and fledging process is complete, or alternatively; a Depredation Permit would be obtained from the U.S. Fish and Wildlife Service (USFWS).

2.8 Comparison of Alternatives

A comparison of the alternatives and the degree to which each alternative fulfills the selection criteria for the proposed project (Section 2.1) are summarized in Table 2. Alternative 3 with either of the underground electrical tie-in options would meet all selection criteria. The Alternative 2 array site would be within Accident Potential Zones I and II of USAFA's airfield. The access road and electrical tie-in for Alternative 2 would be within the Clear Zone and Accident Potential Zone I.

Table 2. Comparison of Alternatives with Selection Criteria.

Selection Criteria	Alternative 3 USAFA's Preferred Alternative		Alternative 2
	With Tie-in Option 1	With Tie-in Option 2	
At least 30 acres in size with expansion capability to 80 acres	Yes	Yes	Yes
Visible from I-25	Yes	Yes	Yes
Not affect the flying mission, and minimize the effect on the Clear Zone and Accident Potential Zones I and II	Yes	Yes	Yes
Minimize effects on Preble's and cultural resource sites	Yes	Yes	Yes
Minimize tree removal and effects on natural resources	Yes	Yes	Yes
Near existing electrical distribution	Yes	Yes	Yes
In a favorable solar insolation area to maximize generation	Yes	Yes	Yes

Chapter 3. Affected Environment and Environmental Consequences

This section provides a summary of the current conditions for and anticipated impacts on those resources potentially affected by the alternatives. It is organized by impact topics that were derived from internal and external public meetings. Impacts of the construction, operation, and maintenance of a solar array up to 8-MW on 80 acres are disclosed.

3.1 Air Installation Compatible Use Zone

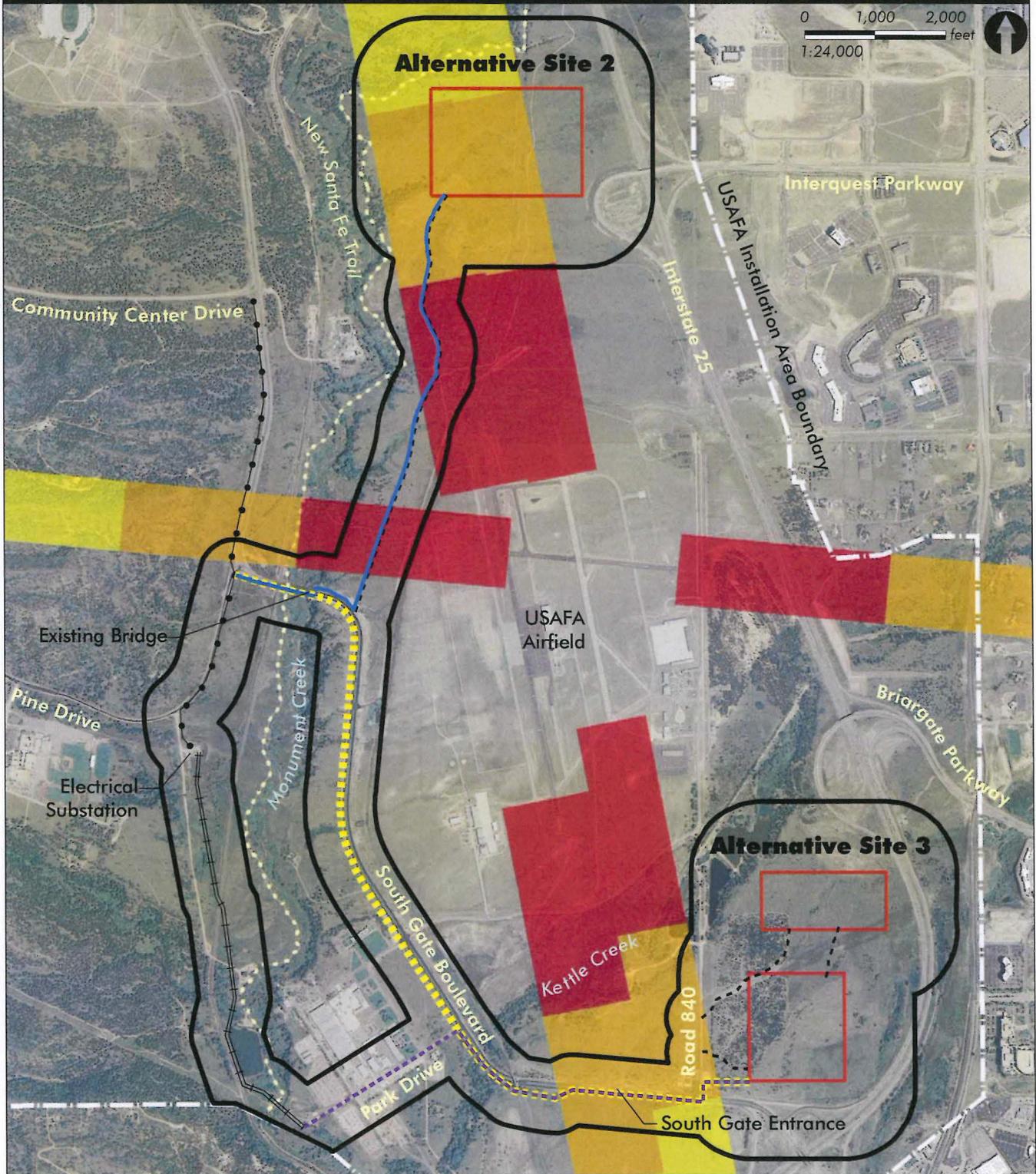
3.1.1 Affected Environment

The USAFA airfield is located on the most level terrain at the southeast end of the USAFA. The airfield has three parallel north-south runways (west, center, and east runways); a crosswind runway; and a grass sailplane landing area. Bordering the runways are the two primary areas for flight line buildings and hangars. This airfield is the primary location for cadet flight-related training, parachute training, and water survival training.

In association with the airfield, the Air Installation Compatible Use Zone program was developed in an effort to protect local citizens from noise and potential accidents associated with flying activities. The program also was intended to prevent degradation of the USAF's capability to achieve its mission by promoting compatible land use planning.

The USAFA has a Class A runway with a Clear Zone 500 feet to each side of the centerline and a 1,000-foot-wide corridor extending from the runway threshold along the extended runway centerline for a distance of 3,000 feet. Three zones were established based on crash patterns: the Clear Zone, Accident Potential Zone I, and Accident Potential Zone II (Figure 4). The Clear Zone starts at the end of the runway and extends outward 3,000 feet. The Clear Zone has the highest accident potential of the three zones. The USAF has adopted a policy of acquiring property rights to areas designated as Clear Zones because of the high accident potential. In general, the USAF (or others under an USAF permit) must not plan, locate, or construct a new use or facility within the boundaries of the Clear Zone (USAFA 2005). Rights-of-way for communications and utilities provided all facilities are at grade level or underground are an allowed use. For Class A runways, such as the existing USAFA runways, Accident Potential Zone I extends from the Clear Zone an additional 2,500 feet. Accident Potential Zone I includes an area of reduced accident potential. Accident Potential Zone II extends from Accident Potential Zone I an additional 2,500 feet in an area of further reduced accident potential. The required width for all zones is 1,000 feet for a Class A runway.

Figure 4. Airfield Zones



LEGEND

Project Features

- Solar Array Footprint
- Alternative 2 electrical tie-in
- - - Alternative 3 electrical tie-in Option 1
- - - Alternative 3 electrical tie-in Option 2
- - - Proposed Access Road

Air Accident Zone Areas

- Clear Zone
- Accident Potential Zone I
- Accident Potential Zone II

Project Area

- Project Area
- Existing Overhead Electrical Interconnection
- Existing Underground Electrical Conduit

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

In the No Action Alternative, all sites would remain undeveloped and there would be no impact to the Air Installation Compatible Use Zones of the USAFA in the foreseeable future.

3.1.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

In Alternative 3, the array site and associated access roads would be located outside the Clear Zone and Accident Potential Zones I and II. There would be no impact to the Air Installation Compatible Use Zones.

Electrical Tie-in

Both Options 1 and 2 would require trenching along South Gate Boulevard within Accident Potential Zone I. Impacts due to trenching would be temporary and minimal.

Operations and Maintenance

Operations and maintenance of the solar array in Alternative 3 would not affect the Air Installation Compatible Use Zones.

3.1.2.3 Alternative 2

Array Site

In Alternative 2, the array site would be within Accident Potential Zones I and II on the north side of the airfield. The access road required for construction and maintenance of the solar array would traverse the Clear Zone and Accident Potential Zone I. As a prohibited use in the Clear Zone, the access road would require a preapproved waiver. With the waiver, there would be no impact to the Air Installation Compatible Use Zones.

Electrical Tie-in

The electrical tie-in would require trenching along the access road alignment within the Clear Zone and Accident Potential Zone I. Impacts due to trenching would be temporary and minimal.

Operations and Maintenance

Operations and maintenance of the solar array in Alternative 2 would require use of the access road, which would traverse the Clear Zone and Accident Potential Zone I. There would be no impact to the Air Installation Compatible Use Zones.

3.2 Future Land Use

3.2.1 Affected Environment

One of the primary tools to be used in guiding future growth is a land use plan. A land use plan is the primary document for ensuring compatibility and managing potential conflict between existing and new facilities, systems, and the physical environment. At the USAFA, the future land use plan functions in a manner similar to zoning regulations for nearby communities. Typically, 12 categories comprise the basic land use types found on an USAF installation. However, 16 land use categories are defined for the USAFA because of its unique mission and atypical training activities. The eight land use categories that occur within the project area are shown in Figure 5 and are defined below (USAFA 2005).

Administration. Administrative areas are the office complexes on an installation. The administrative land use category takes in wing/group headquarters, civilian personnel, and similar office type activities. It also covers security police operations control including gate/visitor management and military operations security.

Community (Service). The community service category contains activities that support family and personal needs at little or no cost to the patron. Facilities that comprise the service part of community support are schools, post office, dining facilities, library, child care center, youth center, chapel, and education centers.

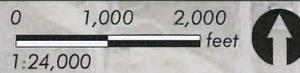
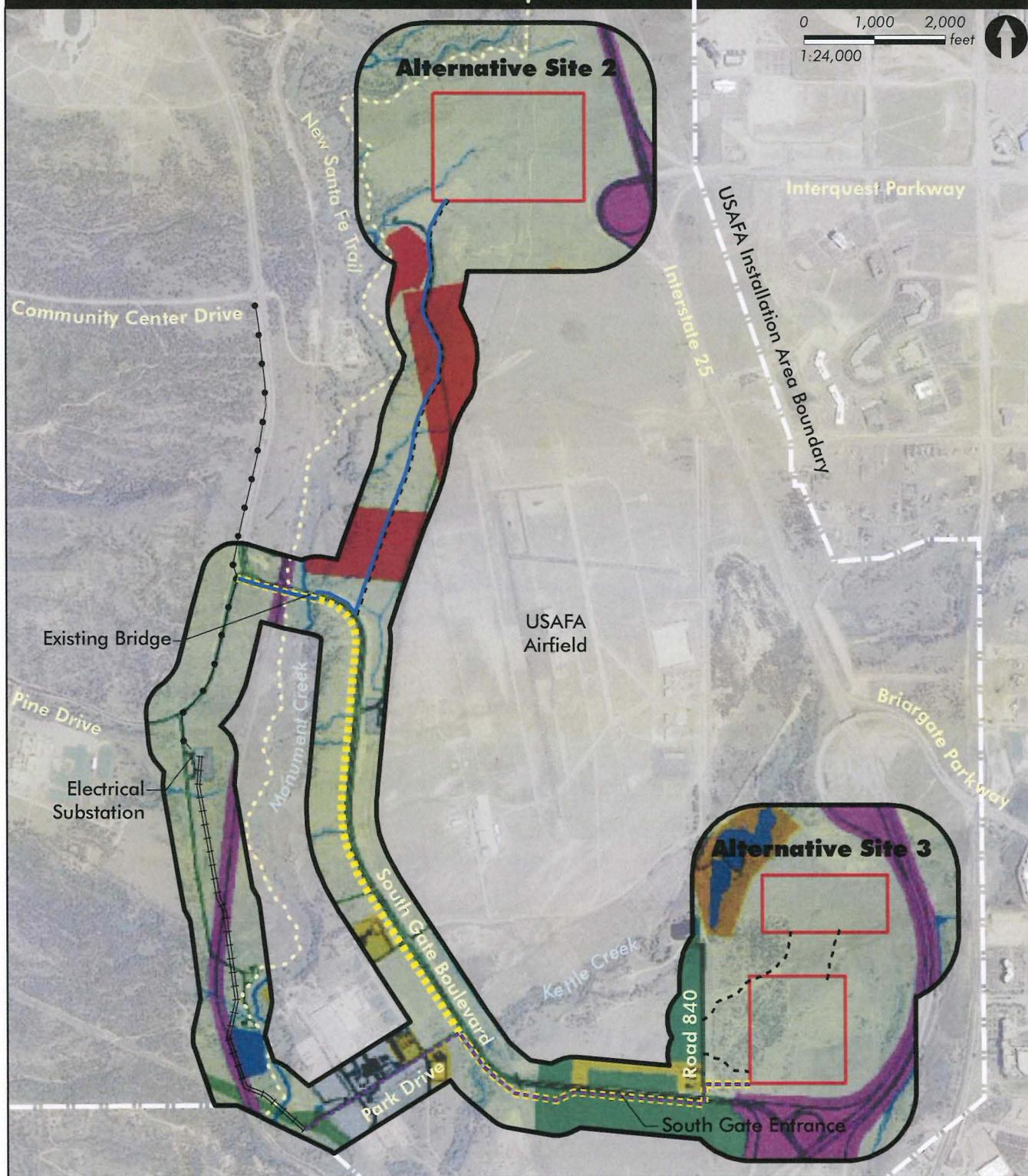
Field Training. This land use category includes those areas where outdoor military training takes place. Specific activities include survival training; combat arms training; initial force beddown; rapid runway repair; and obstacle, confidence, and reaction courses.

Open Space (Designated). This open space category encompasses all outdoor uses that support the academic, military, and athletic programs. Facilities include the athletic fields, parade grounds, pools, family camping, parks and picnic areas, golf courses, riding stables, the Terrazzo level, and the Court of Honor. This category also includes all USAFA easements for public transportation and utilities corridors.

Open Space (Preserved Natural). This land use pertains to non-recreation land that does not contain buildings or other built improvements. Conservation areas, required buffer space, and utility easements are included. This land is not appropriate for building or recreational open space for a variety of reasons, including steep slopes, animal habitats, water bodies, streams, floodplain, or being adjacent to a National Forest. Based on the land use plan (USAFA 2005), the remaining natural open areas are not to be considered a land bank for development.

Open Space (Restricted). Restricted open spaces are reserved, undevelopable land areas designated on the basis of safety requirements. Intensive use of these areas would present an unacceptable level of risk to persons and property. The potential harm may be man-made or natural in its origin. Examples of human activities that create restricted open space are the weapons firing range fans, noise and safety contours associated with the Main Airfield and Aardvark Auxiliary Airfield, landfills and restoration sites, and the quantity/safety distance arc associated with the ammunition storage area.

Figure 5. Future Land Use



LEGEND

Project Features

- Solar Array Footprint
- Alternative 2 electrical tie-in
- - - Alternative 3 electrical tie-in Option 1
- - - Alternative 3 electrical tie-in Option 2
- - - Proposed Access Road

Future Land Use

- Administration
- Community (Services)
- Field Training
- Open Space (Designated)
- Open Space (Preserved Natural)
- Open Space (Restricted)
- Industrial
- Water

- Project Area
- Existing Overhead Electrical Interconnection
- Existing Underground Electrical Conduit

Industrial. Industrial facilities include warehouses for various base activities, base maintenance, and utilities functions, and base industrial services belonging to transportation, communications, supply, and civil engineering. This category also includes open storage areas, the heat plant, water and sewage treatment facilities, and munitions storage.

Water. This land use pertains to on-base ponds, lakes, reservoirs, and major streams.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

In the No Action Alternative, all sites would remain undeveloped and there would be no impact to future land use at the USAFA in the foreseeable future.

3.2.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

In Alternative 3, the array site and associated access roads would be within an area of the USAFA designated as Open Space (Preserved Natural). Alternative 3 would require a change to the land use plan. Future land use would change from the present direction for uses listed under Open Space (Preserved Natural) to Industrial. Although there would need to be a change to the land use plan, the impact would not be significant.

Electrical Tie-in

Both electrical tie-in Options 1 and 2 are compatible with the future land use plan and would not require a change in present direction for uses listed under Section 3.2.1, *Affected Environment*.

Operations and Maintenance

Operations and maintenance of the solar array would not result in impacts to future land use in Alternative 3.

3.2.2.3 Alternative 2

Array Site

In Alternative 2, the array site would be located within an area of the USAFA designated as Open Space (Preserved Natural). The access road for Alternative 2 would be within areas designated as Open Space (Preserved Natural) and Open Space (Restricted). Alternative 2 would require a change to the land use plan. Land use would change from the present direction for uses listed under Open Space (Preserved Natural) to those listed under Industrial. Land use under Open Space (Restricted) would not change from the present direction for uses listed. Although there would need to be a change to the land use plan, the impact would not be significant.

Electrical Tie-in

The electrical tie-in is compatible with the future land use plan and would not require a change in present direction.

Operations and Maintenance

Operations and maintenance of the solar array would not result in impacts to future land use in Alternative 2.

3.3 Solid Waste or Biosolids Application Sites

3.3.1 Affected Environment

Closed Municipal Landfill Site. No hazardous waste sites are within the project area. Two former municipal solid waste landfill sites have been identified in the project area under the USAF's Environmental Restoration Program (ERP), one of which (Site 6), is near the access road to Alternative 2 array site. Site 6 is north of the airfield and east of Monument Creek. Site 6 was operated as a solid waste landfill from 1972 to 1978. Trenches about 40 feet wide by 500 feet long were excavated to a depth of about 30 feet below ground surface (bgs) where either an impenetrable layer or water was typically encountered. Waste was placed in the trenches, which were then backfilled with soil.

The majority of the waste buried at Site 6 is believed to be above the water table. During installation of a monitoring well in the central area at Site 6, municipal solid waste, including paper, glass, plastic, and wood fragments, was observed from a depth of about 6 feet bgs to a depth of about 22 feet bgs. Ground water was encountered at about 28 feet bgs, indicating that buried waste is not in contact with the ground water at this location (USAFA 2008).

The USAFA conducted closure and long-term monitoring of this site with oversight from the CDPHE and the EPA. Under the terms of the closure documents for the site and because buried trash remains at the site, no development or construction is allowed to occur at this location. A full description of the site is in the Administrative Record maintained by the USAFA.

Biosolids Land Application. The USAFA, through a biosolids contractor, operated a state-permitted Class B biosolids land application site through mid-2000. The former application site is on the northwest side of the Interquest Parkway/I-25 interchange. The operation was discontinued for various reasons. The USAFA operates within compliance of an EPA-issued Biosolids General Permit, whether previously land applied at the USAFA or through its current land application contractor at the contractor's state-permitted off-site facility. There is no pending regulatory action regarding the site. Therefore, the USAFA considers the site closed with no further monitoring.

Since the USAFA has not, and does not, discharge industrial wastewater of significance to its Federally Owned Treatment Works, biosolids met Class B requirements including metals limitation. Operation of a Class B biosolids land application site inherently includes the integration of metals into the soil matrix within permitted levels. As an accepted regulated practice, slightly elevated metals concentration in the soil matrix probably exist at the site. These metals are bound in the soil matrix and do not become mobilized due to the elevated soil pH condition. Application site soil and ground water monitoring was performed during operation of the application area.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

No effects would be expected in the No Action Alternative. The management of existing sites would continue according to existing procedures.

3.3.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

In Alternative 3, the array site and associated access roads would be outside of any known ERP sites, as well as the inactive permitted biosolids application area. The management of existing sites would continue according to existing procedures. No effects would be expected for the array site in Alternative 3.

Electrical Tie-in

Both electrical tie-in Options 1 and 2 would be outside of any known ERP sites, as well as the inactive permitted biosolids application area. The management of existing sites would continue according to existing procedures. No effects would be expected for electrical tie-in Options 1 and 2.

Operations and Maintenance

No effects would be expected for operations and maintenance in Alternative 3.

3.3.2.3 Alternative 2

Array Site

In Alternative 2, the array site would be outside of any known ERP sites. The access road would border ERP Site 6 on the east side. Both the array site and access road would be located within the inactive permitted biosolids application area. The management of existing sites would continue according to existing procedures. No effects would be expected for the array site in Alternative 2.

Electrical Tie-in

In Alternative 2, the electrical tie-in would be outside of any known ERP sites. The trench for the electrical tie-in would border ERP Site 6 on the east side. A segment of the electrical tie-in would be located within the inactive permitted biosolids application area. The management of existing sites would continue according to existing procedures. No effects would be expected for the electrical tie-in.

Operations and Maintenance

No effects would be expected for operations and maintenance in Alternative 2.

3.4 Vegetation

3.4.1 Affected Environment

The USAFA is located along the southern portion of the Palmer Divide, an east-west elevated ridge that separates the South Platte River and Arkansas River basins. The Rampart Range, a north-south uplifted portion of the Front Range, forms the western boundary of the USAFA. The different physiogeographic regions provide a transitional ecosystem where Great Plains and montane vegetation communities converge (USAFA 2008).

Due to topographic variation, the location at the convergence of north-south and plains-mountains transition zones, the presence of high-quality grassland and riparian habitat, and the proximity to the undeveloped forested expanses of the Pike National Forest, there are larger areas of native plant communities on the USAFA than would be expected in an area of equivalent size and proximity to an urban center. The USAFA, including the project area, occupies the foothills vegetation zone.

Eight vegetation communities have been identified on the USAFA (USAFA 2008), five of which are found in the project area (Figure 6). The description of existing vegetation communities are based on communities identified by the USAFA and observations made during site visits conducted by ERO Resources Corporation (ERO Resources) in fall 2009. Table 3 lists dominant plants associated with the vegetation communities within the project area.

The most widespread vegetation community within the project area is upland grassland (including short- and mid-grass prairie), which contains a mix of native and nonnative species. Native grasses are prevalent at both the Alternative 2 and Alternative 3 solar array sites.

The riparian shrub/tree/forb community includes riparian and wetland habitat. Wetland and riparian habitat associated with this community is discussed in greater detail under Section 3.6, *Wetlands and Riparian Areas*.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

In the No Action Alternative, existing vegetation communities in the project area would remain relatively unchanged at the USAFA.

3.4.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

The Alternative 3 array site and access roads would result in the permanent loss of 70.5 acres of upland grassland community, 15.4 acres of tree plantation, and 0.1 acre of developed/disturbed lands (Table 4). Disturbed areas are located along a north-south road that forms the western border of the site. For the area east of Monument Creek at the USAFA, these permanent losses represent 2.6 percent of the upland grassland community, 9.9 percent of the tree plantation community, and less than 1 percent of developed/disturbed lands (ERO Resources 2010). The loss of the upland grassland

community and developed/disturbed lands would be insignificant. Based on the condition (i.e., even-aged and poor tree vigor) of the tree plantation, the loss also would be insignificant.

Electrical Tie-in

Option 1. Trenching in this option would temporarily impact 5.1 acres of upland grassland community, 0.3 acre of tree plantation, and 3.2 acres of developed/disturbed lands (Table 4). Trenching in this option would occur mostly adjacent to existing roadways. Impacts would be temporary and insignificant.

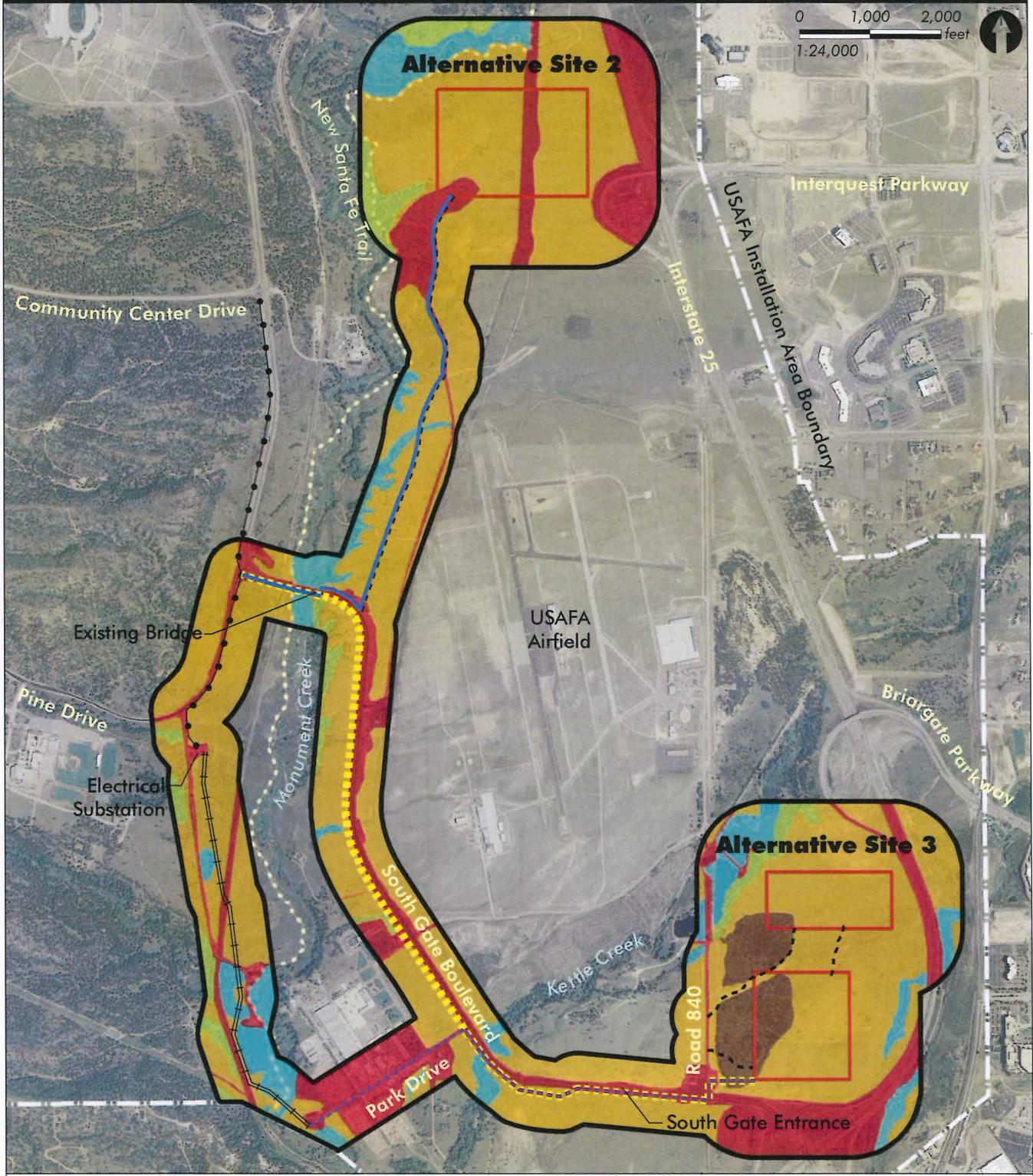
Option 2, USAFA’s Preferred Option. Trenching in this option would temporarily impact 1.1 acres of upland grassland community, 0.3 acre of tree plantation, and 3.8 acres of developed/disturbed lands (Table 4). Trenching in this option would occur mostly adjacent to existing roadways. Impacts would be temporary and insignificant.

Table 3. Vegetative Communities in the Project Area.

Community	Description
Upland Grassland	Mid-grass species include needle and thread grass, Canada wildrye, green needlegrass, little bluestem, western wheatgrass, prairie sandreed, and sand dropseed. Short-grass prairie species include buffalograss, blue grama, western wheatgrass, and purple three-awn. Forbs, small shrubs, and succulents in grassland communities include annual buckwheat, hairy golden aster, annual sunflower, yucca, tarragon, silver sagebrush, fringed sagebrush, prickly pear, and hedgehog cactus. Nonnative species frequently seen in grassland communities include common mullein, crested wheatgrass, and smooth brome. A small community of mountain muhly, little bluestem, and purple threeawn occurs in the northwest portion of the project area, and has been designated as a potential natural area by the USAFA.
Upland Forest	Dominant trees consist of ponderosa pine and Rocky Mountain juniper. Common shrub species include Gambel oak, mountain mahogany, three-leaf sumac, and skunkbrush. Common grasses and forbs include blue grama, buffalograss, junegrass, silver sagebrush, and smooth brome.
Riparian Shrub/Tree/Forb	Prevalent species include wetland species such as cattail, Arctic rush, soft-stem bulrush, and mannagrass. Common shrubs within riparian and wetland areas include sandbar willow, three-leaf sumac, snowberry, skunkbrush, and American plum. Herbaceous upland species include smooth brome, little bluestem, common mullein, annual sunflower, goosefoot, and Canada thistle.
Tree Plantation	Similar to the upland forest community with the lack of a mature canopy. The dominant tree is ponderosa pine. Understory may include smooth brome, needle and thread grass, junegrass, little bluestem, bottlebrush squirreltail, western wheatgrass, silver sagebrush, tarragon, yucca, and prickly pear.
Developed/ Disturbed	This community is commonly dominated by nonnative species such as crested wheatgrass, smooth brome, Kentucky bluegrass, common mullein, tansy mustard, and goosefoot. Isolated noxious weeds such as Canada thistle, bull thistle, spotted and diffuse knapweed, and yellow toadflax frequently occur in disturbed areas. Common native species in disturbed portions of the project area include tarragon, fringed sagebrush, annual sunflower, yucca, and prickly pear. Developed areas typically are devoid of vegetation, but may have noxious weeds and nonnative species present.

Source: USAFA 2008.

Figure 6. Vegetation



LEGEND

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|--|--------------------------|--|
| Project Features | Vegetation | Project Area |
| — Solar Array Footprint | Developed/Disturbed Area | Existing Overhead Electrical Interconnection |
| — Alternative 2 electrical tie-in | Riparian Shrub/Tree/Forb | Existing Underground Electrical Conduit |
| --- Alternative 3 electrical tie-in Option 1 | Tree Plantation | |
| --- Alternative 3 electrical tie-in Option 2 | Upland Forest | |
| --- Proposed Access Road | Upland Grassland | |

Operations and Maintenance

Noxious weed management activities (e.g., mowing and herbicide application) would likely be necessary on the array site and along the access roads. The effects of the management activities would be insignificant. No additional effects would be expected for operations and maintenance in Alternative 3.

3.4.2.3 Alternative 2

Array Site

The Alternative 2 array site and access road would result in the permanent loss of 70.5 acres of upland grassland community, 0.1 acre of riparian shrub/tree/forb community, and 12.4 acres of developed/disturbed areas (Table 4). Disturbed areas include areas adjacent to a former landfill located in the southwest portion of the proposed array footprint. A potential natural area containing a vegetation community dominated by mountain muhly, little bluestem, and purple threeawn exists northwest of the array site, but would not be impacted in Alternative 2. For the area east of Monument Creek at the USAFA, these permanent losses represent 2.6 percent of the upland grassland community, less than 1 percent of the riparian shrub/tree/forb community, and 1.1 percent of developed/disturbed lands (ERO Resources 2010). The loss for these three communities would be insignificant.

Table 4. Vegetation Community Impacts.

Community	Alternative 3, USAFA's Preferred Option			Alternative 2	
	Array/Roads	Tie-in Option 1	Tie-in Option 2 (Preferred)	Array/Road	Tie-in
	(acres)				
Upland Grassland	70.5	5.1	1.1	70.5	0.2
Riparian Shrub/Tree/Forb	0.0	0.0	0.0	0.1	0.0
Tree Plantation	15.4	0.3	0.3	0.0	0.0
Developed/Disturbed	0.1	3.2	3.8	12.4	0.7

Note: Array and access road impacts would be permanent; tie-in impacts would be temporary.

Electrical Tie-in

Trenching for the electrical tie-in would result in temporary impacts to 0.2 acre of upland grassland community. The trenching also would temporarily impact about 0.7 acre of disturbed and developed lands (Table 4). Impacts would be temporary and insignificant.

Operations and Maintenance

Noxious weed management activities (e.g., mowing and herbicide application) would likely be necessary on the array site and along the access road. The effects of the management activities would be insignificant. No additional effects would be expected for operations and maintenance in Alternative 2.

3.5 Noxious Weeds

3.5.1 Affected Environment

Eighteen weed species on the State Noxious Weed List have been documented on the USAFA (USAFA 2008; Land Stewardship Consulting, Inc. 2004). Canada thistle, diffuse knapweed, and yellow toadflax are the most common and widespread noxious weeds on the USAFA. Bull thistle, teasel, spotted knapweed, and musk thistle also are widespread. Comprehensive lists of nonnative and noxious weed species found on the USAFA are in the INWMP and Integrated Natural Resource Management Plan (INRMP) (USAFA 2008).

No widespread infestations of noxious weeds were observed in the project area during surveys conducted in 2009. Isolated diffuse knapweed, Canada thistle, and bull thistle plants were observed in disturbed portions of the Alternative 2 array site. Both myrtle spurge and leafy spurge occur on or near the Alternative 3 array site. Additional nonnative plant species observed throughout the project area include smooth brome, Canadian horseweed, crested wheatgrass, mullein, tansy mustard, and annual ragweed. Both the Alternative 2 and 3 array sites are in close proximity to common corridors (i.e., the highway, railroad, creeks, and recreational trails) that facilitate the spread of noxious weeds. Noxious weeds will be a continual management issue on either array site.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

In the No Action Alternative, ground disturbance from construction of the solar array and electrical tie-in would not occur. Noxious weed coverage would not change.

3.5.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site and Electrical Tie-in Options

No large-scale areas of noxious weeds occur at the array site. Both myrtle spurge and leafy spurge occur on or near the site. Disturbance from construction activities or trenching could increase the abundance and diversity of noxious weeds. Methods for prevention and noxious weed management described in the INWMP would be implemented during and following construction by the owner and operator of the solar array. The site would be monitored following construction to manage potential infestations.

Operations and Maintenance

Vehicles involved in operations and maintenance could potentially introduce or spread noxious weeds. Methods for prevention and noxious weed management described in the INWMP would be implemented by the owner and operator of the solar array. Noxious weed management activities (e.g., mowing and herbicide application) would likely be necessary on the array site and along the access roads. The effects of the management activities would be insignificant. No additional effects would be expected from operations and maintenance in Alternative 3.

3.5.2.3 Alternative 2

Array Site and Electrical Tie-in Option

No large-scale areas of noxious weeds occur at this site. Disturbance from construction activities or trenching could increase the abundance and diversity of noxious weeds into the area. Methods for noxious weed management as outlined in the INWMP would be implemented during and following construction by the owner and operator of the solar array. The site would be monitored following construction to manage potential infestations.

Operations and Maintenance

Vehicles involved in operations and maintenance could potentially introduce or spread noxious weeds. Methods for prevention and noxious weed management described in the INWMP would be implemented by the owner and operator of the solar array. Noxious weed management activities (e.g., mowing and herbicide application) would likely be necessary on the array site and along the access road. The effects of the management activities would be insignificant. No additional effects would be expected from operations and maintenance in Alternative 3.

3.6 Wetlands and Riparian Areas

3.6.1 Affected Environment

Most wetlands on the USAFA are found along streams, springs, ponds, and drainage ditches. The most significant wetlands and riparian habitat in the project area occur along Monument and Kettle creeks and associated tributaries. Patchy wetlands also occur between the Alternative 3 array site and I-25, and southwest of Alternative 2 array site along the proposed access road alignment (Figure 7). Wetlands along Monument Creek, Kettle Creek, and southeast of the Alternative 3 array site include the species listed in the riparian shrub/tree/forb community discussed in Section 3.4, *Vegetation* and shown in Table 3.

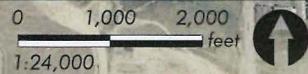
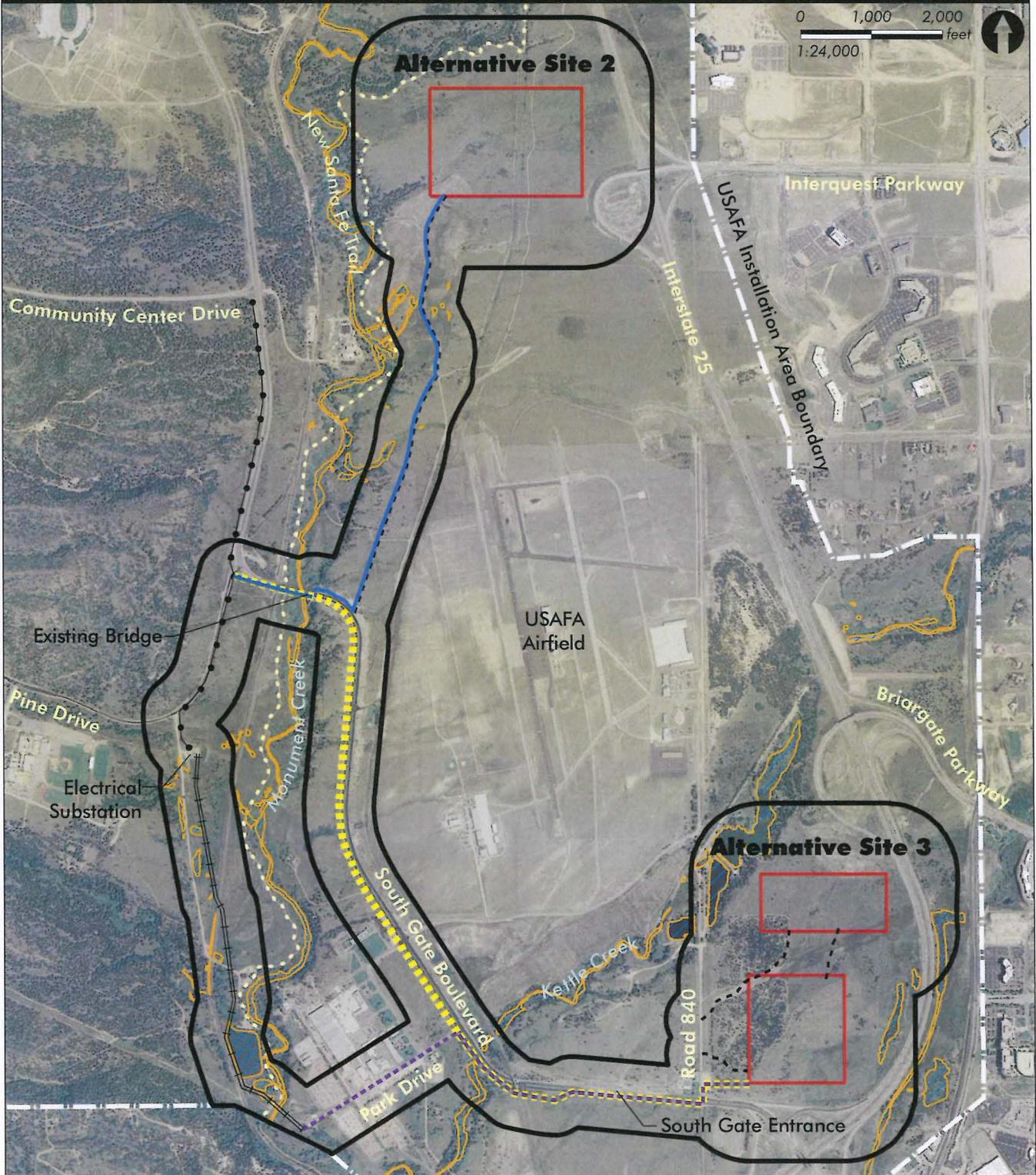
Herbaceous wetlands also are prevalent along Monument and Kettle creeks. This wetland community often contains the same species listed in the riparian shrub/tree/and forb community with the absence of shrub and tree layers. Additional common species in herbaceous wetlands includes broadleaf cattail, hardstem bulrush, watercress, and water speedwell.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

In the No Action Alternative, the solar array and electrical tie-ins would not be developed and existing wetlands would not be impacted.

Figure 7. Wetlands



LEGEND

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| Project Features | Wetland |
| Solar Array Footprint | Project Area |
| Alternative 2 electrical tie-in | Existing Overhead Electrical Interconnection |
| Alternative 3 electrical tie-in Option 1 | Existing Underground Electrical Conduit |
| Alternative 3 electrical tie-in Option 2 | |
| Proposed Access Road | |

3.6.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site and Electrical Tie-in Options

Alternative 3 array site, access roads and electrical tie-in options would not affect any wetlands.

Operations and Maintenance

Operations and maintenance in Alternative 3 would not affect wetlands or riparian areas.

3.6.2.3 Alternative 2

Array Site

Alternative 2 array site and the access road would permanently impact 0.1 acre of riparian shrub/tree/forb habitat, but would not permanently or temporarily impact any wetlands.

Electrical Tie-in

The electrical tie-in would not affect any wetlands or riparian areas.

Operations and Maintenance

Operations and maintenance in Alternative 2 would not affect wetlands or riparian areas.

3.7 Wildlife

3.7.1 Affected Environment

General Wildlife. The diverse vegetation communities found at the USAFA supports a wide variety of wildlife. The mosaic of undeveloped vegetation communities provides a high degree of connectivity between habitat types and maintains migration routes for mule deer, white-tailed deer, American elk, black bear, mountain lion, and wild turkey. Monument Creek and its tributaries provide riparian habitat important to wildlife such as white-tailed deer, Preble's, amphibians, neotropical migratory birds, and native fish species. Ridges and valleys that run west to east across the USAFA are important travel corridors for wildlife. Mid-sized mammals, such as coyote, red fox, striped skunk, and raccoon, occur throughout the USAFA (USAFA 2008).

The project area occupies the foothills vegetation zone. The main vegetation communities occurring in the project area are described in Section 3.4, *Vegetation* and are shown in Figure 6. Mammals, reptiles, and amphibians associated with these vegetation communities are described below, based on observations recorded during site visits conducted by ERO Resources in 2009 and information from the INRMP (USAFA 2008). Bird species occurring in the project area are described in the subsequent *Migratory Birds* section.

Upland Grassland. The project area includes large areas of open space consisting mostly of upland grassland habitat important to mammals such as coyote, red fox, mule deer, Gunnison's prairie dog, spotted ground squirrel, northern pocket gopher, and Western harvest mouse. The Santa Fe Trail and I-25 create barriers to deer, elk, and

other wildlife movement from Monument Creek across grassland habitat. Reptiles occurring in upland grassland areas include the shorthorned lizard, lesser earless lizard, bullsnake, and Western rattlesnake.

Upland Forest. Mammals in upland forests include American elk, mule deer, Abert's squirrel, porcupine, cottontail rabbit, raccoon, black bear, mountain lion, and coyote.

Riparian Shrub/Tree/Forb. Mammals common to the riparian shrub/tree/forb community are white-tailed deer, several bat species, muskrat, cottontail rabbit, raccoon, meadow vole, and Preble's. Chorus frog, northern leopard frog, and other amphibians also are found in the riparian shrub/tree/forb community.

Tree Plantations. Although generally similar to upland forest, tree plantations support fewer species than naturally forested areas. Species occurring in tree plantations include habitat generalists such as elk, mule deer, cottontail rabbit, raccoon, and coyote.

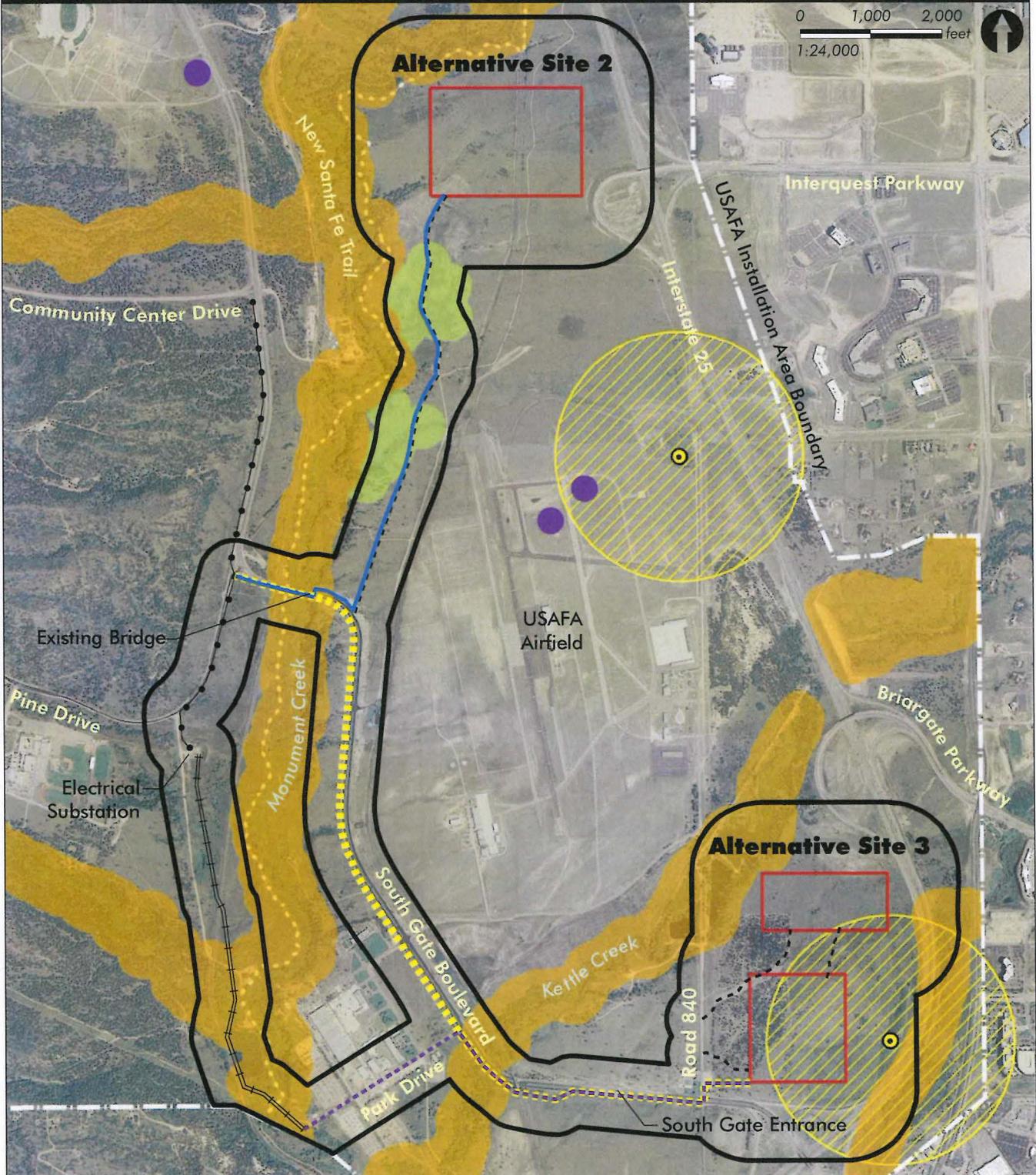
Developed/Disturbed Area. Wildlife occurring in developed/disturbed areas includes species adapted to human presence and nonnative vegetation, such as the house mouse. Medium-sized to large mammals, such as the black bear, coyote, red fox, striped skunk, and raccoon, are frequent visitors in the USAFA housing areas.

Threatened and Endangered Species. The only wildlife species federally listed as threatened or endangered that potentially occurs in the project area is Preble's, a threatened species. Gunnison's prairie dog, a candidate for the federal endangered species list, is found outside the project area (Figure 8).

Preble's was initially found on the USAFA in 1994 by the Colorado Natural Heritage Program (CNHP). Following listing as threatened, the USAFA entered formal consultation with the USFWS on Preble's that covered certain activities on the base. The consultation does not apply to new construction (USAFA 1999; USFWS 2000). Conditions of the USFWS' Biological Opinion for the USAFA's proposed actions in Preble's habitat included the development of a 5-year conservation agreement, which the USAFA and USFWS signed in 2000. The USAFA has adhered to the terms and conditions of the Preble's Conservation Agreement and has renewed the agreement on an annual basis since it expired in 2005 (USFWS 2009). No critical Preble's habitat has been designated at the USAFA. Preble's habitat in the project area is shown on Figure 8. The habitat shown on Figure 8 is based on data from the USAFA and additional mapping completed by ERO Resources in 2009.

Gunnison's prairie dog is one of five species of prairie dog native to North America. Inhabiting grasslands and semidesert and montane shrublands, the Gunnison's prairie dog is considered a keystone species that creates habitat (e.g., burrows and dens), provides food for other species, and helps maintain healthy plant communities. In 2008, the USFWS determined that Gunnison's prairie dog is not threatened or endangered throughout all of its range, but that listing is warranted for the portion of the species' range located in central and south-central Colorado and north-central New Mexico. Currently, listing is precluded by higher priority actions, and the species is considered a "candidate" species for listing. Gunnison's prairie dogs have not been recorded within the project area. Gunnison's prairie dog sightings near the project area are shown on Figure 8.

Figure 8. Wildlife



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| <p>Project Features</p> <ul style="list-style-type: none"> — Solar Array Footprint — Alternative 2 electrical tie-in - - - Alternative 3 electrical tie-in Option 1 - - - Alternative 3 electrical tie-in Option 2 - - - Proposed Access Road | <p>Wildlife</p> <ul style="list-style-type: none"> Preble's Meadow Jumping Mouse Habitat Additional Preble's Habitat ● Gunnison's Prairie Dog Site ● Raptor Nest CDOW Recommended Raptor Nest Buffer | <ul style="list-style-type: none"> Project Area Existing Overhead Electrical Interconnection ● Existing Underground Electrical Conduit <p>Preble's meadow jumping mouse
(Preble's) habitat data (Source: USAFA GIS Data)
Additional Preble's habitat identified during
site-specific evaluation conducted by ERO in fall 2009</p> |
|---|---|---|

Other Species of Concern. During surveys in 1996, the CNHP identified seven sites as significant natural heritage (conservation) wildlife resources (Ellington et al. 1996). Two of the seven sites identified by the CNHP as significant natural heritage wildlife resources at the USAFA occur in the vicinity of the project area (USAFA 2008): Monument Creek and short-grass and mixed grass prairies.

Monument Creek. This area was identified as being of very high significance for biodiversity, and the area contains habitat for the following significant species: Preble's, Hops azure butterfly, cedar waxwing, gray catbird, and northern leopard frog.

Short-grass and Mixed Grass Prairies. Although not yet documented, these areas may provide habitat for the rare olive-backed pocket mouse (Siemers et al. 2003).

Migratory Birds. Most birds in Colorado, except grouse species and nonnative house sparrows, starlings, and rock pigeons (common pigeon), are protected by the MBTA. Bird species associated with the vegetation communities in the project area are described below, based on observations recorded during site visits conducted by ERO Resources in 2009, and information from the INRMP.

Upland Grassland. Grassland birds occurring in the project area include red-tailed hawk, rough-legged hawk, Western kingbird, Western bluebird, horned lark, meadowlark, and vesper sparrow.

Upland Forest. Common birds in upland forest are wild turkey, broad-tailed hummingbird, black-capped chickadee, Steller's jay, pygmy nuthatch, and dark-eyed junco.

Riparian Shrub/Tree/Forb. Representative birds occurring in or near this community include spotted sandpiper, common yellowthroat, yellow warbler, American goldfinch, and broad-tailed hummingbird.

Tree Plantations. Bird species occurring in tree plantations include habitat generalists such as the black-billed magpie, chipping sparrow, and northern flicker.

Developed/Disturbed Area. Birds occurring in developed/disturbed areas include species adapted to human presence and nonnative vegetation such as the black-billed magpie, northern flicker, and house sparrow.

USFWS birds of conservation concern that potentially occur at the USAFA are discussed in the INRMP. The Colorado Division of Wildlife (CDOW) has published recommended buffer zones for nesting and breeding raptors in the State, which generally range from ¼ to ½ mile from a nest site, depending on the species (CDOW 2008). The USFWS typically considers implementation of CDOW buffers and seasonal restrictions as fulfilling compliance requirements of the MBTA for raptors. Two nests potentially used by red-tailed hawks occur in or near the project area (Figure 8). Both nests are near I-25, USAFA roads, and other disturbed areas, suggesting that nest occupants are habituated to a substantial amount of human activity.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

The No Action Alternative would not disturb the project area and would have no effect on wildlife species composition and population dynamics; threatened, endangered, or candidate species; or migratory bird species composition and population dynamics.

3.7.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

General Wildlife. Construction of the Alternative 3 solar array site and associated access roads would result in the permanent loss of 70.5 acres of upland grassland habitat and 15.4 acres of tree plantation (Table 4) that support a variety of mammals, reptiles, and amphibians. For the area east of Monument Creek at the USAFA, these permanent losses represent 2.6 percent of the upland grassland habitat and 9.9 percent of the tree plantation habitat (ERO Resources 2010). The loss of upland grassland habitat would be insignificant. Based on the condition (i.e., even-aged and poor tree vigor) of the tree plantation, the loss of this habitat type would be also insignificant. Impacts to wildlife from the loss of 0.1 acre of developed/disturbed areas would be insignificant because the habitat in these areas is low quality.

The Alternative 3 solar array would create an additional barrier to movement of larger wildlife species across the grassland habitat, resulting in increased habitat fragmentation. Species with smaller home ranges, such as reptiles and small mammals, would be most affected by habitat loss and disturbance. Some direct mortality of smaller species could occur during construction of the array and associated access roads. Noise, vehicle use, and other human activities associated with construction and maintenance may result in habitat avoidance or disrupt behavior of some wildlife species.

Threatened and Endangered Species. Construction associated with the Alternative 3 array site would not impact Preble's or its habitat. Because the nearest observed location for Gunnison's prairie dog is about 1 mile from the array site and access road, physical habitat disturbance from Alternative 3 would not impact Gunnison's prairie dog. Prairie dogs depend on visual surveillance for predators and intraspecific interactions, and prefer open plant communities with short-stature vegetation (Fitzgerald and Lechleitner 1974). The presence of solar panels overhead would likely discourage colonization of the Alternative 3 array site by prairie dogs. Alternative 3 would not impact threatened and endangered species.

Migratory Birds. The permanent loss of upland grassland and tree plantation habitat resulting from construction of the Alternative 3 array site and associated access road would decrease bird populations and species diversity in the project area. Ground-nesting bird species requiring large areas of grassland, such as horned larks and western meadowlarks, would be most affected by habitat loss. The permanent loss would represent 2.6 percent of the upland grassland habitat east of Monument Creek on the USAFA (ERO Resources 2010). The loss of the upland grassland habitat would be insignificant.

Vegetation clearing and earth moving during construction of Alternative 3 facilities could result in the destruction of active nests or eggs, or nest abandonment, if conducted during the migratory bird breeding season. Part of the array site is within the CDOW-recommended 1/3-mile buffer for red-tailed hawk nests (CDOW 2008). Impacts to nesting raptors from noise and other disturbance during construction of Alternative 3 would be minimal because any nest occupants would probably be habituated to noise from vehicular traffic and other human disturbance. To minimize impacts to migratory birds from Alternative 3, surveys for nesting birds would be conducted in areas proposed for disturbance, and, if active nests are identified in the disturbance area, ground-disturbing activities would be delayed until the nesting and fledging process is complete, or alternatively, a Depredation Permit would be obtained from the USFWS. Noise, vehicle use, and other human activities associated with construction and maintenance could result in habitat avoidance or could disrupt behavior of some bird species. These impacts are expected to be temporary and insignificant.

Electrical Tie-in

Option 1

General Wildlife. Trenching would result in the temporary disturbance of 5.1 acres of upland grassland habitat, less than 0.3 acre of tree plantation in the road right-of-way, and 3.2 acres of developed/disturbed area (Table 4). General habitat quality in the road right-of-way is currently degraded by periodic ground-disturbing activities, invasions of non-native and noxious weed species, noise, and other disturbance associated with the road; therefore, direct impacts to wildlife would be insignificant. Noise, vehicle use, and other human activities could result in some temporary and insignificant disturbance to wildlife in surrounding habitats.

Threatened and Endangered Species. Construction of Option 1 would cross through Preble's habitat along Kettle Creek. The trenching would be within the mowing zone (i.e., up to 20 feet from the edge of the road). No consultation would be required based on previous consultation with the USFWS. Option 1 would have no impacts on threatened and endangered species.

Migratory Birds. Option 1 would result in temporary impacts to upland grassland, tree plantation, and developed/disturbed areas within the road right-of-way. General habitat quality in the road right-of-way is currently degraded by periodic ground-disturbing activities, invasions of non-native and noxious weed species, noise, and other disturbance associated with the road; therefore, direct impacts to birds would be insignificant. Noise, vehicle use, and other human activities could result in some temporary and insignificant disturbance to birds in surrounding habitats.

Option 2, USAFA's Preferred Option

General Wildlife. Impacts to general wildlife from Option 2 would be the same (i.e., temporary and insignificant) as described for Option 1, except that slightly less upland grassland and slightly more developed/disturbed area would be impacted (Table 4).

Threatened and Endangered Species. A segment of an existing interconnection to be upgraded would cross Preble's habitat. All line-stringing activities would occur from

existing roads or two-tracks and no new surface disturbance would occur in association with upgrades of the existing transmission line. The USFWS concurred that Option 2 would have no effect on Preble's or their habitat (Miszta 2010). All other impacts to threatened and endangered species from Option 2 would be the same as described for Option 1.

Migratory Birds. Impacts to migratory birds from Option 2 would be the same as described for Option 1 (temporary and insignificant), except that slightly less grasslands and slightly more developed/ disturbed area would be impacted (Table 4). To avoid bird collisions and electrocutions, the tie-in and new dedicated line strung on existing poles would be constructed according to Utilities' Avian Protection Plan (EDM 2008).

Operations and Maintenance

Noise, vehicle use, and other human activities associated with operations and maintenance could result in habitat avoidance or could disrupt behavior important to the survival and reproduction of some wildlife species. Impacts due to operations and maintenance would be insignificant.

3.7.2.3 Alternative 2

Array Site

General Wildlife. About 70.5 acres of upland grassland habitat and 0.1 acre of riparian shrub/tree/forb habitat (Table 4) would be permanently lost in Alternative 2. For the area east of Monument Creek at the USAFA, these permanent losses represent 2.6 percent of the upland grassland habitat and less than 1 percent of the riparian shrub/tree/forb community (ERO Resources 2010). The loss of these habitat types would be insignificant. Grassland-associated species with smaller home ranges, such as reptiles and small mammals, would be most affected by habitat loss and disturbance. Impacts to wildlife from the loss of 12.4 acres of developed/disturbed areas would be minimal because habitat in these areas is low quality. Other impacts of Alternative 2 on wildlife would be similar to Alternative 3.

Threatened and Endangered Species. Construction of the access road associated with the Alternative 2 array site would result in the permanent loss of 1.6 acres of potential Preble's habitat. An additional 1.7 acres would be temporarily disturbed during access road construction. Road construction activities may affect the Preble's and would require Section 7 consultation with the USFWS. Impacts to Gunnison's prairie dog from Alternative 2 would be the same as Alternative 3.

Migratory Birds. About 70.5 acres of upland grassland habitat and 0.1 acre of riparian shrub/tree/forb habitat (Table 4) would be permanently lost as a result of Alternative 2. Ground-nesting bird species requiring large areas of grassland, such as horned larks and western meadowlarks, would be most affected by habitat loss. The loss represents 2.6 percent of the upland grassland habitat and less than 1 percent of the riparian shrub/tree/forb community east of Monument Creek on the USAFA (ERO Resources 2010). The loss of these habitat types would be insignificant. Impacts to birds from the loss of 12.4 acres of developed/disturbed areas would be minimal because habitat in these areas is low quality. Disturbance to raptors would likely be minimal because

construction activities would not occur within the CDOW-recommended raptor disturbance buffers (CDOW 2008). Other impacts from Alternative 2 on birds would be similar to Alternative 3 impacts. Measures to minimize nest destruction or abandonment would be the same as Alternative 3.

Electrical Tie-in

General Wildlife. The Alternative 2 electrical tie-in would result in temporary impacts to 0.2 acre of upland grassland habitat and 0.7 acre of developed/disturbed areas. Due to the low habitat quality and small extent of the impacted areas, direct impacts to wildlife would be minimal. Noise, vehicle use, and other human activities could result in some temporary and insignificant disturbance to wildlife in surrounding habitats.

Threatened and Endangered Species. Construction of the Alternative 2 electrical tie-in along the new access road would result in temporary impacts to 1.7 acres of potential Preble's habitat. Trenching and other construction activities in this area may affect the Preble's and would require Section 7 consultation with the USFWS. The Alternative 2 electrical tie-in would also cross through a very small area of Preble's habitat on the east side of the bridge that crosses Monument Creek. However, the trenching would be within the mowing zone and would have minimal impact on Preble's.

Migratory Birds. The Alternative 2 electrical tie-in would result in temporary impacts to 0.2 acre of upland grassland and 0.7 acre of disturbed/developed areas. Due to the low habitat quality or small extent of the impacted areas, direct impacts to birds would be minimal. Noise, vehicle use, and other human activities could result in some temporary and insignificant disturbance to birds in surrounding habitats.

Operations and Maintenance

Noise, vehicle use, and other human activities associated with operations and maintenance could result in habitat avoidance or could disrupt behavior important to the survival and reproduction of some wildlife species. Impacts due to operations and maintenance would be insignificant.

3.8 Water Resources

3.8.1 Affected Environment

Surface Water. The predominant surface water feature in the project area is Monument Creek, which runs from north to south on the east side of the USAFA. Perennial streams flowing into Monument Creek near the project area from the west are West Monument Creek, with Black Squirrel Creek and Kettle Creek flowing from the east. Some tributary streams that flow into Monument Creek from the east have been affected by urban development, and sedimentation has been severe (USAFA 2005). Besides area streams, a small lake, Ice Lake, is west of Monument Creek, adjacent to an existing overhead electrical interconnection.

Surface water on the Alternative 2 array site flows in a southwesterly direction and is drained by an unnamed tributary that flows into Monument Creek southwest of the site or into a constructed ditch adjacent to a former landfill site. Water in the ditch is routed around the former landfill and drains into Monument Creek.

The northern portion of the Alternative 3 array site is drained by an unnamed tributary that flows into Monument Creek southwest of the site, near USAFA's southern border. The southern portion of the Alternative 3 array site generally slopes to the southwest with a localized high point in the southern half of the site that cause surface water to flow to the west and east. Two swales on the southern portion of the Alternative 3 array site divert surface water to the southeast toward I-25 and into Pine Creek, which is a tributary of Monument Creek.

Ground Water. Both array sites lie on the western edge of the Denver aquifer, which composes part of the larger Denver basin. This basin is formed of several layers of aquifers that are each separated by a confining layer. The water present in these aquifers was deposited millions of years ago when the basin was formed. Due to the lack of connectivity between aquifers and to surface water (infiltration or recharge of aquifer from surface water), ground water present in the aquifers is not considered renewable.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

In the No Action Alternative, the solar array would not be constructed. Water resources would not be affected.

3.8.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

Soil disturbance associated with grading and construction of the solar array and access roads would increase the potential for erosion and sedimentation. BMPs would be implemented during construction to minimize surface water runoff. Topsoil would be salvaged and used on disturbed areas that would be revegetated where practicable in accordance with USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees* (USAFA 2009). Maintenance roads located between each subsection of solar panels would be surfaced with gravel. In addition, the access road would not be paved and would not add to the impervious surface area. During a precipitation event, stormwater would strike the solar panels, flow down the panel, and drip off the edge. Most water would infiltrate the soil as the soils at the Alternative 3 array site are coarse-textured, with rapid infiltration of runoff. Stormwater runoff rates following construction would meet the historical, undeveloped runoff rate. Runoff from the array would be expected to continue to either infiltrate into the surrounding soils, or flow to the tributaries of Monument Creek at historical, undeveloped release rates.

A Stormwater Pollution Prevention Plan would be prepared and a Notice of Intent would be filed with the EPA for coverage under EPA's NPDES General Permit for Stormwater Discharges from Construction Activities. Impacts on surface water resources would be insignificant. The Alternative 3 array site would not affect ground water resources.

Electrical Tie-in

Soil disturbance associated with soil removal and replacing during trenching for both Options 1 and 2 would increase the potential for erosion and sedimentation. BMPs would be implemented during construction to minimize surface water runoff. Following

construction, the trench would be revegetated in accordance with USAFA's *Standard Specifications for Site Restoration, Revegetation and Trees* (USAFA 2009). Impacts on water resources would be insignificant.

Operations and Maintenance

No effects would be expected for operations and maintenance in Alternative 3.

3.8.2.3 Alternative 2

Array Site

The array site in Alternative 2 is underlain by the same soil types as Alternative 3. Impacts on surface water resources for Alternative 2 and the associated access road would be the same as Alternative 3. Impacts on surface water resources would be insignificant. The Alternative 2 array site would not affect ground water resources.

Electrical Tie-in

Impacts on water resources for the Alternative 2 electrical tie-in would be the same as Alternative 3. Impacts on water resources would be negligible.

Operations and Maintenance

Operations and maintenance in Alternative 2 would not affect water resources.

3.9 Cultural Resources

3.9.1 Affected Environment

The USAFA is in an area where the combination of physiographic characteristics creates a circumstance in which a mosaic of plant and animal communities that are typical of diverse mountain, plains, and riparian environments exists as an almost continuous ecotone in the Palmer Divide area. The Palmer Divide provided diverse and rich resources for the prehistoric and historic occupants of the region.

Alternative 2 and 3 are along the eastern boundary of the USAFA, in areas removed from vegetation transition zones and areas of intact Holocene age sediments, both often associated with eligible prehistoric sites. The soils that have developed in the alluvium at both Alternative 2 and 3 array sites are sufficiently developed to suggest an age of deposition that likely predates the human occupation of the area. Consequently, the potential for intact buried cultural deposits is very low.

Eight separate cultural resource surveys have been completed on the USAFA since 1985. The surveys have evaluated most of the USAFA, including the Alternative 2 and 3 array sites and the electrical tie-ins. Hundreds of cultural resources (both sites and isolated finds) were identified during these surveys. These resources include a number of prehistoric camps and lithic scatters, foundations of historic structures, trash dumps, irrigation ditches, isolated features, and structures associated with farming and ranching, miscellaneous other historic sites, a historic town site, and a historic railroad grade. Several of these resources are considered eligible for listing in the (National Register of

Historic Places) NRHP, or need additional data before an eligibility determination can be completed.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

In the No Action Alternative, the solar array would not be constructed. There would be no effect on historic properties.

3.9.2.2 Alternative 3, USAFA's Preferred Alternative

Array Site

Alternative 3 is on a sloped site with a ridge in the approximate center of the site. Sediments on Alternative 3 are of mixed alluvium and eolian origin, and the ridge in the middle of the site was interpreted during a cultural resource survey as a stabilized sand dune. A sparse, prehistoric lithic scatter is on the northeast-facing slope of this ridge, close to the top and just outside the northeast corner of the proposed array site. The site was recommended as not eligible for inclusion on the NRHP in 1995, and the Colorado State Historic Preservation Office (CO SHPO) determined it not eligible in 1999. No other known sites are located close to this site or the access road associated with Alternative 3. The array site in Alternative 3 would have no effect on historic properties.

Electrical Tie-in

Effects of both Options 1 and 2 would be the same. A possible historic homestead, recommended as not eligible for inclusion on the NRHP in 1995 and determined not eligible by CO SHPO in 1999, is close to both tie-in options. Both electrical tie-in options would have no effect on the possible historic homestead. In addition, both electrical tie-in options would be bored under a segment of abandoned grade of the Santa Fe Railroad, which is eligible for inclusion on the NRHP. There would be no effect on the abandoned railroad grade. Both electrical tie-in options would have no effect on historic properties.

Operations and Maintenance

Operations and maintenance in Alternative 3 would not affect historic properties.

3.9.2.3 Alternative 2

Array Site

An abandoned early 20th Century homestead consisting of two depressions, an elm wind-break, irrigation features, and two trash scatters dating from the late 1940s to early 1950s, is located just outside the southeast edge of the proposed array site. The abandoned homestead was recommended not eligible for inclusion on the NRHP in 1994, and CO SHPO determined it not eligible in 1995. A 1,500-foot segment of abandoned grade of the Santa Fe Railroad, which is eligible for inclusion on the NRHP, runs from north to south through Alternative Site 2. This 1,500-foot segment would be graded level as part of the construction for Alternative 2. Such alteration would be an adverse effect to the

site, and would require mitigation in consultation with CO SHPO. No other known sites are located close to the array site or the access road associated with Alternative 2.

Electrical Tie-in

The electrical tie-in would be near a historic trash scatter. In 1995, this site was recommended as not eligible for inclusion to the NRHP in the field, and was determined not eligible by the CO SHPO in 1999. The electrical tie-in would have no effect on historic properties.

Operations and Maintenance

Operations and maintenance in Alternative 2 would not affect historic properties.

Chapter 4. Cumulative Impacts

4.1 Cumulative Effects

A cumulative effect is an incremental effect of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can be individually minor, but collectively significant from actions taking place locally or regionally over a period of time. Several projects are planned at the USAFA and on lands adjacent to and abutting the USAFA. Current and planned projects and program expansions on the USAFA include additional expansion of I-25 and Powers Boulevard/I-25 Interchange; utility upgrades including a new South Substation and utility line replacements; construction of a temporary large vehicle search facility; and possible development of a Colorado Army National Guard training facility. These projects, and their anticipated cumulative effect, are described in the following sections.

4.1.1 Additional Expansion of I-25 and Powers Boulevard/I-25 Interchange

The Colorado Department of Transportation completed widening of I-25 adjacent to the USAFA to three lanes in each direction. The EA also covered additional widening of I-25 adjacent to the USAFA to four lanes in each direction and a proposed interchange at I-25 and Powers Boulevard. As proposed, the Powers Boulevard and I-25 interchange will consist of a signalized diamond interchange tied into ramps that connect with the planned northern extension of Powers Boulevard. Any impacts on wetlands and Preble's from the proposed interchange will require compensatory mitigation. Other resources potentially affected include Gunnison's prairie dog and the New Santa Fe Trail.

4.1.2 New South Substation and Utility Line Replacements

Utilities plans to build and operate an upgraded substation directly south of the current South Substation near Pine Drive that will replace the existing substation. The new substation and infrastructure, including fencing and a buffer zone, will occupy 1.8 acres. The disturbance area includes three underground 34.5-kV circuits and the extension of a dirt berm that blocks sightlines between the New Santa Fe Trail along Monument Creek and the existing South Substation. Once the new substation is built, the existing South Substation will be demolished and the site revegetated.

New distribution lines will be installed to allow most of the USAFA load to be carried by either the West or the South Substation. An assembly of electrical distribution duct bank (i.e., an assembly of conduits) that loops around the perimeter of the campus will carry two 12.5-kV feeders for the new substation and two 12.5-kV feeders from the West Substation to meet at the open tie points. Two 12.5-kV feeders from the West Substation will loop through the academic area in a new electric distribution trench. All new distribution lines will be installed within 15 feet of existing roads. No new roads or overhead lines will be constructed.

4.1.3 Temporary Large Vehicle Search Facility

The USAFA plans to build a temporary facility that will enhance the security of the USAFA installation by allowing personnel to conduct more thorough searches of large vehicles away from the primary entry point. The facility will include a small structure for

employees and vehicle occupants. The search facility will occupy an estimated 1 acre and will be fenced with an entry gate and exit gate. The location of the proposed search facility will be near the South Gate.

4.1.4 National Guard Readiness Center

In support of the U.S. Army's "Grow the Army" initiative, the Colorado Army National Guard plans to build a National Guard Readiness Center. The disturbance area for the facility will be about 30 acres. Construction of the National Guard Readiness Center is estimated to be completed by 2011.

4.2 No Action Alternative

The No Action Alternative would not contribute to cumulative effects on any of the resources evaluated.

4.3 Alternatives 2 and 3

4.3.1 Air Installation Compatible Use Zone

Future projects would not be expected to impact the Air Installation Compatible Use Zones. The Proposed Action would have no cumulative effects.

4.3.2 Future Land Use

Alternatives 2 and 3, in combination with the construction of new facilities and infrastructure, would result in cumulative effects in changes from the present direction for uses listed under Open Space (Preserved Natural) to other land use categories such as Industrial. Although there would need to be a change to the land use plan, the impacts would not be significant.

4.3.3 Solid Waste or Biosolids Application Sites

Future projects would not be expected to impact solid waste or biosolids application sites. The Proposed Action would have no cumulative effects.

4.3.4 Vegetation

Past development in and around the USAFA has resulted in the loss and degradation of native vegetation. The Proposed Action, in combination with the construction of new facilities and infrastructure, would contribute to the cumulative losses and degradation of vegetation communities, especially upland grasslands at the USAFA. The Temporary Large Vehicle Search Facility and National Guard Readiness Center would result in the loss of 1 acre and 30 acres of upland grasslands respectively. These losses of upland grasslands would be about 1.2 percent of the upland grasslands east of Monument Creek on the USAFA. For the Proposed Action, the permanent loss of upland grasslands would be 2.6 percent of the upland grasslands east of Monument Creek on the USAFA (ERO 2010). Cumulatively, the loss of 101.5 acres or 3.8 percent of the upland grasslands east of Monument Creek on the USAFA would be insignificant.

4.3.5 Noxious Weeds

The Proposed Action would contribute to the cumulative losses and degradation of vegetation communities, including increased noxious weeds. The diversity and abundance of noxious weeds would likely increase, even with additional noxious weed management, because of the size of the disturbance and possible difficulties with revegetation efforts. In addition, an increase in the use of selective or non-selective herbicides would likely be required, which may make it difficult for USAFA to meet goals to reduce herbicide use. Through the use of BMPs for noxious weed management, the cumulative effects would be insignificant.

4.3.6 Wetlands and Riparian Areas

Past and present actions have been, and reasonably foreseeable actions will be subject to Section 404 permitting and mitigation requirements. The Proposed Action would not result in cumulative effects to wetlands.

4.3.7 Wildlife

The Proposed Action, in combination with the construction of new facilities and infrastructure, would result in cumulative losses and degradation of vegetation communities and associated wildlife habitat, especially upland grasslands, at the USAFA. The percentage of upland grassland habitat lost would be insignificant relative to the total grassland habitat east of Monument Creek on the USAFA (see 4.3.4 *Vegetation* above).

Some minor cumulative effects to Preble's could occur from Alternative 2 and other past, present, and reasonably foreseeable actions; however, potential impacts to Preble's would require Section 7 consultation with the USFWS. The USFWS would require compensatory mitigation for any losses of Preble's habitat resulting from a project, as well as the implementation of measures to avoid direct mortality of Preble's. Overall, cumulative effects on Preble's would be insignificant.

4.3.8 Water Resources

The cumulative impacts of continued development in the past at the USAFA include the degradation of several stream corridors. Erosion and sedimentation during construction, increased stormwater volume, increased stormwater peak flows, and sequential frequency of stormwater events have all contributed to stream deterioration. Soils at the USAFA generally consist of decomposed granite and have low water holding capacity. During precipitation events, stormwater infiltrates these highly permeable soils, but once saturation occurs or the runoff is excessive, erosion can occur.

Efforts to control stormwater at the USAFA have focused on maintaining post construction historic rates of release from the project site. This method of control mitigates stream degradation such as stormwater volume, erosion, and sediment deposition.

Future projects would use source control to minimize downstream impacts. The objective of source control is to imitate the existing hydrologic conditions and in so doing preserve the existing water balance to minimize downstream impacts. This could be accomplished on site by a number of methods that would be project specific. With

implementation of source control and additional BMPs, the Proposed Action would not be expected to cumulatively contribute to impacts on water resources.

4.3.9 Cultural Resources

Future projects would not be expected to impact historic properties. The Proposed Action would have no cumulative effects.

Chapter 5. List of Preparers

This EA has been prepared under the direction of the DoD and USAFA. The individuals who contributed to the preparation of this document are listed below.

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Chapter 6. Consultation and Coordination

An interdisciplinary team of biologists, planners, facility managers, engineers, and consultants conducted preliminary internal scoping of the project to identify the range of potential alternatives and resource issues. On October 1, 2009, a public open house was held at the USAFA to solicit input from the community on the solar array project. In October 2009, a newsletter was distributed containing an introduction to the EA process, a project description, EA timeline, and soliciting input.

Agencies and Persons Consulted

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- thy, 1994-2000;
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- kle, 1983-2000;
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Colorado Department of Public Health and Environment

PUBLIC NOTICE

March 14, 2010

NOTICE OF OPPORTUNITY TO COMMENT ON DRAFT PERMIT MODIFICATION FORT CARSON HAZARDOUS WASTE PERMIT

Facility: Fort Carson
Address: 626 O'Connell Blvd., Bldg 813 Fort Carson, CO 80913
EPA ID No.: CO2210020150
Permit No.: CO-06-09-29-01

Background:
The purpose of this Public Notice is to notify the public of the opportunity to comment on the draft permit prepared to incorporate a Division-initiated permit modification to Fort Carson's Hazardous Waste permit. The permit modification is to select No Further Action as the remedy for SWMU 50 - DRMO Inactive Hazardous Waste Storage Area; SWMU 55 - Used/Waste Oil Tank, Building 523; SWMU 56 - Used/Waste Oil Tank, Building 301; SWMU 60 - Used/Waste Oil Tank, Building 1382; SWMU 63 - Used/Waste Oil Tank, Building 1692; and SWMU 73 - Used/Waste Oil Tank, Building 2792.

Public Comments:
From March 14, 2010 to April 28, 2010, CDPHE invites any interested person to submit written comments on the draft modifications to the permit. Only the sections of the permit being modified are subject to public comment [6 CCR 1007-3, §100.60(c)(2)]. To request a public hearing concerning this modification, a written request stating the nature of the issues to be raised at the hearing must be submitted to CDPHE's contact person during the public comment period.

FAILURE TO RAISE AN ISSUE OR PROVIDE INFORMATION DURING THE PUBLIC COMMENT PERIOD MAY PREVENT YOU FROM RAISING THAT ISSUE OR SUBMITTING SUCH INFORMATION IN AN APPEAL OF THE DEPARTMENT'S FINAL DECISION [6 CCR 1007-3, §100.50(a)].

CDPHE will consider all comments on the portions of the permit being modified prior to making a final permit decision. Following the public comment period, CDPHE will issue a final permit decision and a response to comments in accordance with 6 CCR 1007-3, §§100.511 and 100.512.

The draft permit and supporting documents are available for review during normal business hours at the offices specified below.

For information about the draft permit, or to submit written comments, contact CDPHE's contact person:

Deb Anderson
CDPHE/HMWMD
4300 Cherry Creek Dr S
Denver CO 80246-1530
303.692.3379 or 1.888.569.1831 x3379
Fax: 303.759.5355
deb.anderson@state.co.us

To review and/or copy the draft permit at Fort Carson, contact:

Becky Allen
Directorate of Public Works - Environmental Division
1626 O'Connell Blvd., Bldg. 813
Fort Carson, CO 80913
719.526.1682

The draft permit is also available for review at the following facilities:

Fort Carson's Grant Library Penrose Library
4950 Flint Street 20 North Cascade Avenue
Fort Carson, CO 80913 Colorado Springs, CO 80903
719.526.8144 719.531.6333

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PUBLIC NOTICE

The United States Air Force Academy (USAF) and Colorado Springs Utilities announce the availability of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the proposed USAFA Solar Array Project. The USAFA and Colorado Springs Utilities have reached an agreement for Colorado Springs Utilities to deliver renewable photovoltaic energy to the USAFA in the form of an onsite utilities scale photovoltaic facility. The funding for this project came from the American Recovery and Reinvestment Act (ARRA) of 2009.

The Draft EA assesses the potential environmental effects resulting from construction, operation and maintenance of a solar array system within the USAFA boundary. The Draft EA has been completed in accordance with the President's Council on Environmental Quality regulations, 40 CFR 1500-1508, which implement the requirements of the National Environmental Policy Act.

The Draft EA and Draft FONSI are available for a 30-day public review that begins on March 12, 2010. Please visit the project website (www.csu.org) to view or download the full Draft EA and Draft FONSI.

The Draft EA and Draft FONSI will also be available at Colorado Springs Utilities, 121 S. Tejon Street, 4th Floor, Colorado Springs, CO 80903.

Written comments via mail, email, or facsimile regarding this Draft EA and Draft FONSI must be received by April 12, 2010 to:

Colorado Springs Utilities
Kim Hurley
P.O. Box 1103, Mail Code 940
Colorado Springs, CO 80947

email: khurley@csu.org
fax: 719-668-8666

OR

10 CES/CEV
8120 Edgerton Drive
United States Air Force Academy, CO 80840

email: 10ces.cevenvironmental@usafa.af.mil
fax: 719-472-9295

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