United States Air Force Academy

Environmental Assessment for Fiber Optic Diverse Route

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Terracon Consultants, Inc.

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FINDING OF NO SIGNIFICANT IMPACT
FIBER OPTIC DIVERSE ROUTE
UNITED STATES AIR FORCE ACADEMY, COLORADO

PROPOSED ACTION: The United States Air Force Academy (USAFA) is proposing to install a new fiber optic line to provide the required redundancy to the base's communication system from Building 8130 in the Service and Supply Area to the south electrical substation off Park Drive. The fiber optic line will be placed in a shallow trench excavated within the mow track or dirt roadway edge and along the New Santa Fe Trail corridor. All spoils from the trench will be stockpiled on the trail or road for backfilling the excavation. The crossing of Monument Creek will be accomplished by routing the fiber optic cable through a conduit attached to the footbridge. This will eliminate impacts to wetlands, floodplains, and Preble's Meadow Jumping Mouse habitat.

PURPOSE AND NEED: The Proposed Action is required by Air Force regulations and is necessary to support current and future mission needs. The new pathway will allow the USAFA to establish a redundant and diverse backup route for the existing fiber-optic cable which currently serves all the USAFA. This diverse route is critical to mitigate the potential risks and effects to the communications facilities in the event of damage to the tri-intersection bridge, which crosses Monument Creek, or at other location along the existing route.

NO ACTION ALTERNATIVE: Under the no action alternative, all communication lines within the Service and Supply area of the USAFA would continue to be routed over the tri-intersection bridge, and a redundant system to be used as a backup in the event of primary line failure would not be constructed. Under the no action alternative, the mission of the USAFA would continue to be degraded and the communications network would not be able to accommodate additional capacity. In the event that the existing fiber optic line was severed, local critical communications would cease until the line could be repaired. Essential services including emergency and security forces dispatch would be compromised.

SUMMARY OF FINDINGS FOR THE PROPOSED ACTION:

Air Quality: During construction, the Proposed Action will have minor and transitory impacts on air quality. These impacts will primarily be associated with particulate releases during the digging of the trench for the fiber optic line and from any vehicular traffic that disturbs the vegetative cover of the land surface. In addition, vehicular exhaust from equipment used during the construction activities will temporarily diminish air quality. None of the emissions are expected to be substantial, and none will extend beyond the construction/reclamation period, which is expected to be less than six months. Because the area of disturbance is estimated to be less than 25 acres and the disturbance period will be less than six months, the activity is exempt from Colorado Department of Public Health and Environment (CDPHE) permitting and reporting requirements. Standard mitigation measures for construction such as minimizing areas of disturbance, dust control and rapid reclamation of disturbed areas should be employed. These measures will minimize potential contributions to the occasional PM_{10} exceedances that occur in the vicinity of the USAFA.

Geology: Because the Proposed Action will be confined to previously disturbed areas along roadways, parking areas, and the pedestrian trail which do not have significant geological features. Therefore, the Proposed Action will have no significant impact on geology.

Soils: Installation of the fiber optic line under the Proposed Action will require excavation of soil. However, these impacts will be localized and insignificant. The potential for disturbed surface soil to become windblown or erode can be minimized through the use of rapid reclamation techniques after construction, including backfilling the trench as the fiber optic line is installed and implementing dust control measures.

Water Resources: The fiber optic line will be suspended underneath the pedestrian bridge over Monument Creek, thus eliminating the need for directional boring, or trenching and filling in these sensitive areas. Therefore, the Proposed Action will not impact Waters of the United States (WUS) including wetlands existing within the 100-year flood plain of Monument Creek.

During construction, temporary impacts to water quality could occur from erosion of soil in areas disturbed near Monument Creek by trench digging or heavy equipment movement. Implementation strom water and erosion controls and rapid reclamation techniques after construction will minimize such effects on water quality.

Biological Resources: The Proposed Action will stay along roadways and foot paths that have already been disturbed, thus eliminating any potential for impacts to vegetation resources and impacts to wildlife resources from disturbance of cover and foraging sites. A finding of “no effect” for the Proposed Action on threatened and endangered species was determined by the USAFA and was subsequently confirmed by the United States Fish and Wildlife Service. No mitigations are necessary or proposed because the disturbance will be contained within the road and trail and under the Monument Creek footbridge.

Cultural Resources: No cultural resources would be adversely affected by the Proposed Action. Construction of the fiber optics line under the Proposed Action will not harm the historic character of the Service and Supply Area portion of the base in any physical or permanent way.

Recreation: Access will be restricted on portions of the New Santa Fe Trail, Ice Lake, and the associated parking areas and roadways during the construction period of the fiber optic line under the Proposed Action. The easement agreement between the USAFA and El Paso County allows the USAFA to access the trail for any utility use which would include construction of the new fiber optic line. Therefore, the USAFA will not need an access agreement from the County to trench along the New Santa Fe Trail. However, signs will be posted two weeks before construction begins in designated parking lots and at trailheads describing the construction activities and timeline.

Environmental Justice: Concentrated areas of low income, minority, or disadvantaged residents do not exist within the USAFA.

Hazardous Materials and Waste: It is highly unlikely that hazardous wastes will be encountered or generated during the trenching activities, or as a result of not installing the fiber optic line. Nevertheless, any hazardous wastes encountered during the redundant fiber optic line project will be handled fully in accordance with the USAFA's approved Hazardous Waste Management Plan. Heavy equipment and other vehicles associated with the trench line construction will contain hazardous materials such as motor oil and gasoline that could spill on the ground in small quantities as a result of mechanical failure and human error. Such spills are not anticipated and would be mitigated through compliance with the USAFA’s existing spill prevention program.

Land Use: No change in land use would result from implementing the Proposed Action.

Noise: Temporary and insignificant noise impacts from the Proposed Action will be limited to the construction period. The source of the noise impact will be from the use of mechanized equipment to install the fiber optic line. Quality construction practices will minimize such noise.

Transportation: Access will be restricted to portions of Park Drive and access roads during the construction period of the Proposed Action. Pedestrians and bicyclists using the New Santa Fe Trail as a transportation corridor will be impacted during the construction period, as well. However, the construction period is only expected to last two to three days, and reclamation of the areas impacted by the trenching activities are expected to happen immediately following installation of the fiber optics line.

CUMULATIVE IMPACTS: The environmental assessment (EA) reviewed cumulative impacts that could result from the incremental impact of the action when added to other reasonably foreseeable future actions in the area. With the incorporation of best management practices, cumulative impacts that would result from the Proposed Action would not be considered significant.

MITIGATION: No mitigation measures are required for the Proposed Action. Although no mitigation is required, best management practices will be implemented to prevent or minimize the potential for environmental impacts. These best management practices would require the USAFA and/or its contractors to:

1. Incorporate and follow the "Overarching Environmental Specifications – United States Air Force Academy" to ensure that environmental impacts are minimized during project construction.
2. Practice standard quality construction measures pertaining to erosion such as minimizing areas of disturbance, watering areas that must be disturbed, use of “silt dams” to minimize sheet flow of water and silt, and rapid, successful reclamation.
3. Confine all heavy equipment associated with trenching activities to paved or disturbed surfaces whenever possible.
4. Install the redundant communications line using a minimum of heavy equipment, relying on equipment carried by hand or by small vehicles.
5. Implement the spill prevention program during construction activities to avoid spills of motor oil, gasoline, or other wastes from the site.
6. Implement standard quality construction measures pertaining to noise minimization such as the use of mufflers on mechanical equipment and avoidance of construction during time periods when noise would be particularly intrusive (e.g., on weekends when trail use may be higher).

Transportation: Access will be restricted to portions of Park Drive and access roads during the construction period of the Proposed Action. Pedestrians and bicyclists using the New Santa Fe Trail as a transportation corridor will be impacted during the construction period, as well. However, the construction period is only expected to last two to three days, and reclamation of the areas impacted by the trenching activities is expected to happen immediately following installation of the fiber optics line.

CUMULATIVE IMPACTS: The environmental assessment (EA) reviewed cumulative impacts that could result from the incremental impact of the action when added to other reasonably foreseeable future actions in the area. With the incorporation of best management practices, cumulative impacts that would result from the Proposed Action would not be considered significant.

MITIGATION: No potential impacts were classified as significant. Implementation of the proprosed action at the Preferred Alternative location would require the use of best management practices to prevent or minimize the potential for environmental impacts. These best management practices would require the USAFA and/or its contractors to:

1. Incorporate and follow the "Overarching Environmental Specifications – United States Air Force Academy" to ensure that environmental impacts are minimized during project construction.
2. Practice standard quality construction measures pertaining to erosion such as minimizing areas of disturbance, watering areas that must be disturbed, use of "silt dams" to minimize sheet flow of water and silt, and rapid, successful reclamation.
3. Confine all heavy equipment associated with trenching activities to paved or disturbed surfaces whenever possible.
4. Install the redundant communications line using a minimum of heavy equipment, relying on equipment carried by hand or by small vehicles.
5. Implement the spill prevention program during construction activities to avoid spills of motor oil, gasoline, or other wastes from the site.
6. Implement standard quality construction measures pertaining to noise minimization such as the use of mufflers on mechanical equipment and avoidance of construction during time periods when noise would be particularly intrusive (e.g., on weekends when trail use may be higher).

DECISION: Based on the EA conducted in accordance with the National Environmental Policy Act, the Council of Environmental Quality regulations, and implementing regulations set forth in 32 CFR 989 (Environmental Impact Analysis Process), the United States Air Force Academy concludes that, with incorporation of best management practices for resources as described herein, the environmental effects of the proposed fiber optic diverse route at the Preferred Alternative location 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 July 24, 2010, is hereby incorporated by reference, and is on file at 10th Civil Engineer Squadron, Environmental Flight, 8120 Edgerton Road, Suite 40, US Air Force Academy, Colorado 80840 ATTN: Environmental Planner.

APPROVED:

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

1 SEP 10
DATE

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ACRONYMS LIST

AFI	Air Force Instruction
amsl	above mean sea level
APCD	Air Pollution Control Division
AST	aboveground storage tanks
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulation
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
dBA	decibels on the A-weighted scale
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
HAZMAT	Hazardous Materials
I-25	Interstate 25
INRMP	Integrated Natural Resources Management Plan
L_{dn}	day-night average noise levels
mph	miles per hour
MSDS	material safety data sheets
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PM_{10}	particulate matter <10 microns
SAFE	Secure Academy For Everyone
SHPO	State Historic Preservation Office
TNC	The Nature Conservancy
USAF	U.S. Air Force
USAFA	U.S. Air Force Academy
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tanks

1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The United States Department of the Air Force proposes to construct a new underground communications pathway between Building 8130 and the South Substation manhole, identified as MH HS-2, of the United States Air Force Academy's (USAFA) Service and Supply area in Colorado Springs, El Paso County, Colorado. The 18,455-acre USAFA is situated along the Rocky Mountain Front Range, approximately six miles north of downtown Colorado Springs and 60 miles south of Denver, Colorado (see Figure 1). The proposed route is located entirely within the limits of the USAFA on the southern portion of the base.

For the purposes of analyzing potential impacts caused by the proposed project, a smaller area, referred to as the Service and Supply Study Area, has been identified. This area includes all property within 1,000 feet of the proposed project, and contains all resources that could be directly disturbed or otherwise impacted by the proposed project. The general boundary of the Service and Supply Area is identified on Figure 2.

This environmental assessment (EA) has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) implementation guidelines; Air Force Instruction (AFI) 32-7061, The Environmental Impact Analysis Process, as promulgated by Title 32, Part 989 of the Code of Federal Regulations (CFR); and other applicable federal, state, and local environmental laws and regulations. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, which is designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action, and that alternatives to that contemplated action have been considered.

1.2 Purpose and Need

The proposed action is necessary because existing underground communication pathways are inadequate to support current and future mission needs. The new pathway will allow the USAFA to establish a diverse backup route for the fiber-optic cable currently serving all the USAFA and provide redundancy to the system. This diverse route is critical to mitigate the potential risks and effects to the communications facilities in the event of damage to the tri-intersection bridge, which crosses Monument Creek.

1.3 Decisions to be Made

This EA evaluates the potential benefits and environmental consequences of installing a new underground communications pathway in the Service and Supply area of the USAFA. Based on this evaluation, the USAF 10th Air Base Wing, Commander (10ABW/CC) will determine whether to issue a Finding of No Significant Impact (FONSI) or to prepare an Environmental Impact Statement (EIS). As required by NEPA and its implementing regulations, preparation of an EA document must precede final decisions regarding the proposed project to inform decision makers of the potential environmental impacts of the proposed or alternative actions.

1.4 Organization of this Environmental Assessment

This EA contains five alternatives: No Action Alternative, Alternative A: the Proposed Action, and Alternatives B, C, and D. Section 2 of this EA identifies and describes each of the proposed and alternative actions, and justifies the elimination from further consideration two

alternatives as non-viable in meeting the USAFA mission needs. Section 3 describes the environment on and around the Service and Supply Area that could potentially be affected by the remaining three alternatives. Section 4 addresses potential impacts of the proposed or alternative actions, along with recommendations for minimizing or mitigating those impacts.

2.0 DESCRIPTION OF PROPOSED ALTERNATIVES

The USAFA is situated in the foothills of the Rampart Range north of Pikes Peak, which lies to the west of Colorado Springs, Colorado. The Service and Supply Area of the USAFA is located in the southern portion of the USAFA property. It is bound by South Gate Boulevard, Pine Drive, and Stadium Drive on the north, by South Gate Boulevard on the east, by Park Drive on the southeast and generally by access roads and rail road tracks on the west (Figure 2). USAFA support and maintenance activities are focused in this area which contains various maintenance shops, support offices, and the military working dogs training and kennel areas.

Currently, a single fiber optic communications line exists that transmits all communications for the Service and Supply Area and to the southern portion of the USAFA. This line runs from MH HS-2 near the south electrical sub-station north along Park Drive, east across the tri-intersection bridge, then south along South Gate Boulevard to Building 8130. The existing communications pathway is illustrated on Figure 4.

The required new backup communications line must meet the following criteria:

- According to the DoD Std 19 IE-PLN-08, the fiber optic line must have adequate separation from the existing line to prevent a single intrusive event from severing the lines and interfering with mission communications;

- The selected alternative must utilize the existing knowledge base of personnel and maintenance capabilities of the USAFA;

- The fiber optic line path must disturb the least amount of the USAFA's natural environment as possible; and

- The excavation for installation of the fiber optic must not be made in the embankment for Ice Lake (upstream face and crest of downstream face), spillway, intake, or within 20 feet of the toe of the embankment.

After considering the above goals and constraints, five alternatives, as described below, were developed by the USAFA for routing the new communications pathway and increasing the security of the USAFA's communications network. However, as a result of the preliminary screening, only three alternatives were retained for further development and evaluation.

2.1 Alternatives

2.1.1 No Action Alternative

Inclusion of a no action alternative is prescribed by NEPA requirements to serve as a baseline (i.e. existing condition) against which the environmental effects of a proposed action can be evaluated. The no action alternative refers to the continuation of existing conditions of the affected environment, without implementation of the proposed action. Under the no action alternative, all communication lines within the Service and Supply area of the facility would

continue to be routed over the tri-intersection bridge, and a redundant system to be used as a backup in the event of primary line failure would not be constructed. Under the no action alternative, the mission of the USAFA would continue to be degraded and the communications network would not be able to accommodate additional capacity. In the event that a line was severed, local critical communications would cease until the line could be repaired. Essential services including emergency and security forces dispatch would be compromised.

2.1.2 Alternative A – Preferred Alternative

Alternative A is an alternative routing path for the redundant communications line that incorporates existing roads, footpaths, and bridge structures. The routing path for Alternative A is shown on Figure 3. Specific construction activities that would arise from implementing the proposed action include:

- From within manhole (MH)-SS-13B4, bore to the west approximately 150 feet underneath the intersection of Park Drive and Security Drive. From the southwest corner of the intersection, a 1,300-foot trench approximately eight inches wide would be dug adjacent to Park Drive and subsequently onto the footpath to the footbridge that is suspended over Monument Creek. Approximately 250 feet of conduit would be used to house the fiber-optic line across the footbridge.

- From the west side of the footbridge, which spans Monument Creek and is associated with the New Santa Fe Trail, a small trench would be dug from the footbridge to the New Santa Fe Regional Trail. The fiber optic line would be suspended from the footbridge to cross Monument Creek. The trench would follow along the New Santa Fe Regional Trail footpath and the dirt access road north to a point approximately 150 feet to the east of the railroad track. This trench section would be approximately 2,700 feet in length.

- From the end of the bore on the west side of the rail road track, a final trench would be dug to the north towards MH HS-2 along the east edge of the dirt roadway 701, connecting to an existing communication fiber optic line located in the manhole at the electrical South Substation. This trench would also be approximately 2,700 feet in length.

- All trenches and pits would be installed using a ride-along trencher machine with eight-inch teeth, and would be compacted and returned to original grade when completed. The surface of the road and trail will be returned to their pre-construction condition.

- Approximately 25,000-30,000 square-feet of total ground disturbance is expected to be involved with the construction activities; the ground disturbance would be limited to within the mow track or dirt roadway edge and along the New Santa Fe Trail corridor.

2.1.3 Alternative B – Redundant Fiber Optic Line Following Alternate Path

Alternative B considers laying the second communications line in a new trench that follows a more westerly path as compared to the Alternative A from Building 8130 to the electrical substation. As outlined in Figure 4, this path begins at MH-SS-13B4 and follows the same general path over the footbridge. However, in an effort to reduce the impact along the New Santa Fe Trail recreation corridor, the trench would be routed west along a dirt access road that extends to the train tracks southerly adjacent to the southwest corner of Ice Lake. The trench line would then parallel an access road westerly adjacent to the train tracks north to the intersection of the train tracks and the dirt roadway. At this intersection, the trench would follow

along the western edge of the roadway to connect with an existing communication fiber optic line located in the manhole at the electrical South Substation.

2.1.4 Alternative C – Redundant Fiber Optic Line Following Existing Line Path

Alternative C considers laying the second communications line in a new trench that follows the same route as the existing line. The existing route is mapped on Figure 4. This alternative would alleviate the potential impact to natural areas of the USAFA environment by installing the new line in an area that has been previously trenched for communications lines. However, this alternative does not meet the need of the USAFA because it does not adequately eliminate the bottle-neck effect of all communications utilities currently traveling across the tri-intersection bridge, and the risks posed to the communications facilities in the event of damage to the bridge. Because this alternative was determined to not meet the DOD standard requirements for the USAFA, this alternative was eliminated from further study in this EA.

2.1.5 Alternative D – Wireless Communications

Alternative D considers the use of wireless communications technology instead of a second fiber optic line. Under this alternative, microwave antennas would be installed in the Service and Supply Area to transmit communications signals as a backup system to the existing fiber optic line system. This alternative would alleviate potential environmental impacts caused by trenching on the base. However, concerns are presented by this technology regarding the lack and availability of trained operators and support staff assigned to USAFA to ensure delivering reliable and continuous signal transmission and system security. Because of the need for uninterrupted signal transmission and the potentially sensitive nature of military communications, the wireless option was eliminated from further study in this EA.

2.2 Identification of the Preferred Alternative

The USAFA's preferred alternative is Alternative A.

3.0 AFFECTED ENVIRONMENT

The affected environment is the baseline against which potential impacts caused by an action are assessed. This chapter describes the human environment at the U.S. Air Force Academy that has the potential to be affected by implementing the proposed or alternative actions. As stated in 40 CFR 1508.14, the human environment is interpreted comprehensively to include natural and physical resources and the relationship of people to those resources.

3.1 Climate and Air Quality

3.1.1 Climate

The regional climate of the USAFA is considered semi-arid with approximately 15 inches of annual precipitation. The majority of precipitation occurs between March and September during thunderstorms and occasional hailstorms. Snowstorms occur every winter, but blizzards are rare. Annual temperatures at the USAFA range from a monthly mean of 30°F in January to 86°F in July. In summer, the average daily temperature is 68.4°F and the average daily maximum is 82.3°F. The highest recorded temperature was 100°F in June 1954. Temperature inversions are common in the region, typically occurring during the winter months.

The average relative humidity ranges from approximately 35 to 45 percent with the lowest levels occurring in mid-afternoon during the spring months. Humidity is higher at night through all four seasons, and the average at dawn is approximately 63 percent. The percentage of sunshine is 72 percent in summer and 71 percent in winter. The prevailing wind direction is from the north-northeast. Average wind speed is 10.4 miles per hour (mph), with higher average speeds (12.2 mph) in April (Nakata and Associates [Nakata], 1992).

3.1.2 Air Quality

The area surrounding the USAFA is currently in compliance with all National Ambient Air Quality Standards (NAAQS) (Colorado Department of Public Health and Environment - Air Pollution Control Division [CDPHE- APCD], 2004).

The high altitude and adjacent mountains provide ideal conditions for temperature inversions, which reduce dispersion of airborne pollutants. These occurrences can occasionally lead to NAAQS violations for PM_{10} (particulate matter <10 microns). Primary contributors of PM_{10} violations are fireplace emissions and fine particulates generated by street sanding operations. Although the region currently shows compliance with the fine particulate standard, further control strategies for PM_{10} are being considered.

3.2 Geology and Soils

3.2.1 Geology

The USAFA is located at the base of the Rampart Range, at elevations from 6,376 feet above mean sea level (amsl) at Monument Creek near the south boundary to 7,600 feet amsl at the western boundary near the Stanley Creek Trailhead. The average elevation of the Service and Supply Area is approximately 6,440 feet amsl. The Dawson Arkose, which is comprised of sandstone, siltstone, claystone, and minor conglomerate, underlies most of the western portion of the USAFA (Trimble and Machette, 1979). The Dawson Arkose was created by the erosion and deposition of detrital material derived from weathering of the Pikes Peak granite. Alluvial deposits of bouldery cobble gravel, known as Slocum Alluvium, are generally found in valley floors and drainages of the USAFA. Slocum Alluvium was deposited during the Pleistocene and can contain significant amounts of calcium carbonate where it has not been removed by erosion. The thickness of this geologic unit is generally less than 24 feet. This unit often forms gently sloping surfaces approximately 180 to 230 feet above existing streams (Trimble and Machette, 1979).

The Rampart fault, which runs north-to-south along the base of the Rampart Range, is quaternary in age with the earliest known displacement along the fault occurring sometime in the last 1.8 million years (Howard et al., 1978). The U.S. Geological Survey (USGS) National Earthquake Information Center considers the USAFA area to be relatively aseismic. No earthquake epicenters have been recorded at the USAFA since 1800. The nearest event was a minor quake recorded in 1979 with a magnitude of 2.9 on the Richter Scale; the epicenter was located approximately 25 to 30 miles west of the USAFA.

3.2.2 Soils

A review of the “Soil Survey of the El Paso County Area, Colorado” (SCS 1981) indicates four soil types (Truckton, Stapleton, Kettle, and Columbine) have been identified within the Service and Supply Area (Figure 5) with the following soil characteristics.

- Columbine gravelly sandy loam (0% to 3% slopes) – Map Unit No. 19: This deep, well drained to excessively drained soil formed in coarse textured material on alluvial terraces and fans and on flood plains. Typically, the surface layer is grayish brown gravelly sandy loam about 14-inches thick. The underlying material is light yellowish brown very gravelly loamy sand. Permeability of this soil is very rapid, and the available water capacity is low to moderate. Surface runoff is slow, and the hazard of erosion is slight to moderate.

- Kettle gravelly loamy sand (8% to 40% slopes) – Map Unit No. 41: This deep, well drained soil formed in sandy arkosic deposits on uplands. Typically, the surface layer is gray gravelly loamy sand about three inches thick. The subsurface layer is light gray gravelly loamy sand about 13-inches thick. The subsoil is very pale brown gravelly sandy loam about 24-inches thick. It consists of a matrix of loamy coarse sand that has thin bands of coarse sand that has thin bands of coarse sandy loam or sandy clay loam. The substratum to a depth of 60 inches or more is light yellowish brown extremely gravelly loamy sand Permeability of this soil is rapid, and the available water capacity is low to moderate. Surface runoff is medium, and the hazard of erosion is moderate.

- Stapleton sandy loam (3% to 8% slopes) – Map Unit No. 83: This deep, non-calcareous, well drained soil formed in sandy alluvium derived from arkosic bedrock on uplands. Typically, the surface layer is grayish brown sandy loam about 11-inches thick. The subsoil is grayish brown gravelly sandy loam about 6-inches thick. The substratum extends to a depth of 60 inches or more. It is pale brown gravelly sandy loam in the upper part and grades to gravelly loamy sand in the lower part. Permeability of this soil is rapid, and the available water capacity is moderate. Surface runoff is slow, and the hazard of erosion is moderate.

- Truckton sandy loam (0% to 3% slopes) – Map Unit No. 96. This deep, well drained soil formed in alluvium and residuum derived from arkosic sedimentary rock on uplands. Typically, the surface layer is grayish brown sandy loam about five inches thick. The next layer is dark grayish brown sandy loam about three inches thick. The subsoil is brown sandy loam about 16-inches thick. The substratum is light yellowish brown coarse sandy loam to a depth of 60 inches or more. Permeability of this soil is moderately rapid, and the available water capacity is moderate. Surface runoff is slow, and the hazard of erosion is moderate.

3.3 Water Resources

The dominant perennial drainage in the USAFA is Monument Creek, which generally flows north-to-south along the west side of the USAFA and through the Service and Supply Area (see Figure 2). The headwaters of Monument Creek are springs in the Rampart Range north and west of the main facilities. The USAFA has preserved Monument Creek, and it represents one of the best remaining plains streams in the upper Arkansas River drainage. Monument Creek serves as a refuge for several species of rare plants and for the Preble's meadow jumping mouse, a federally listed (threatened) species.

Buffering areas on either side of Monument Creek within the Service and Supply area contain "significant wetlands," as defined in the U.S. Air Force Academy Integrated Natural Resources Management Plan [INRMP] (USAFA, 2008). In 2002, wetland delineation was completed for the USAFA using aerial photographs, National Wetland Inventory (NWI) maps, existing data on project-specific jurisdictional delineations, and extensive field surveys and ground-truthing of site vegetation and surface hydrology indicators (USAFA, 2008). The 2002 delineation revealed

that the USAFA supports both riverine (wetlands within a channel) and palustrine (nontidal wetlands dominated by trees, shrubs, or emergent plants) wetland habitats. Of the 313 wetlands and other waters of the United States identified on base, 90 areas are in riverine systems and 223 areas are within the palustrine system. A combined total of 213 acres of wetland and other waters of the United States were identified. Monument Creek, the largest perennial stream on the USAFA, was mapped as palustrine habitat because wetland vegetation occupies both banks and low islands within the stream, and typically covers a greater width than the stream itself (USAFA, 2008). Figure 6 provides a map of the delineated wetlands in the Service and Supply area of the USAFA based on the 2002 USAFA Wetland Study.

A small tributary named West Monument Creek enters the Service and Supply Study area from the west, and provides water to Ice Lake. Ice Lake is approximately 5.5 acres in surface area, and holds approximately 34.07 acre-feet of water (USAFA, 2008). Monument Creek and the associated wetlands are considered to be in good condition with stable banks and excellent riparian vegetation. Figure 7 is a more detailed view of the wetlands boundaries in the area of potential effect by the Proposed Action.

Groundwater at the USAFA occurs in the Dawson Aquifer (which underlies most of the USAFA) and in alluvial aquifers associated with Monument Creek and its tributaries. Water from the Dawson Aquifer is generally 20 to 100 feet deep, and yields are generally less than 200 gallons per minute. Water from alluvial aquifers is found between 5 and 20 feet deep; however, portions of the aquifer are not perennially saturated (Hillier and Hutchinson, 1980a,b). Eight water wells in the Dawson Aquifer are located along Monument Creek and are used to supplement the non-potable water supplies. These wells range from 357 to 1,065 feet below ground surface and capacities range from 15 to 400 gallons per minute (USAFA, 2002).

3.4 Biological Resources

3.4.1 Vegetation

Vegetation at the USAFA is diverse due to variations in topography and elevation. The USAFA's vegetation resources are significant in that they encompass the entire elevation-related gradient from prairie grasslands to montane forests. The mosaic created by the various plant communities is a critical aspect of the biodiversity found at the USAFA. The Service and Supply Area consists of both natural and developed/disturbed areas. The latter are characterized by nonnative Kentucky bluegrass groundcover and ornamental trees and shrubs. Natural vegetation communities surround the developed areas, and consist of upland grasslands and riparian vegetation (USAFA, 2008).

The upland grassland community in this area consists of a mixed- and short-grass prairie that includes big bluestem (*Andropogon gerardii*), needle-and-thread (*Stipa comata*), sandreed (*Calamovilfa longifolia*), fringed sage (*Artemisia frigida*), and Parry's oatgrass (*Danthonia parryi*). (USAFA, 2002).

Riparian vegetation at the lower elevations is primarily willow (*Salix spp.*) and cottonwood (*Populus angustifolia and P. deltoides*), changing to alder (*Alnus spp.*) and then to spruce (*Picea*) and Douglas fir (*Pseudotsuga menziesii*) at higher elevations (USAFA, 2008).

3.4.2 Wildlife

Similar to the vegetation resources, wildlife at the USAFA is diverse. Factors contributing to the high biodiversity include the presence of high-quality riparian areas, topographic variation, the

USAFA's location at the convergence of north-south and plains-mountains transition zones, and the nearby undeveloped forested expanses of Pike National Forest. The large percentage of undeveloped natural areas on the base and the numerous vegetation types and their resulting pattern provide a high degree of connectivity between habitat types and maintain essential migration routes for mule deer *(Odocoileus hemionus),* white-tailed deer *(Odocoileus virginianus)*, American elk *(Cervus elaphus)*, black bear *(Ursus americanus)*, mountain lion *(Felis concolor)*, and wild turkey *(Meleagris gallopavo)*. Wildlife at the USAFA has been well documented by USAFA faculty and through cooperative programs with the Colorado Division of Wildlife (CDOW), The Nature Conservancy (TNC), the Colorado Natural Heritage Program (CNHP), and the U.S. Fish and Wildlife Service (USFWS). The following paragraphs categorize wildlife species that presently occur or have the potential to occur within the Service and Supply Area according to the vegetation zones with which they are most commonly associated.

Upland grassland

Mammals in the grasslands community include coyote, red fox, Gunnison's prairie dog (*Cynomys gunnisoni*), spotted ground squirrel *(Spermophilus spilosoma)*, northern pocket gopher *(Thomomys talpoides)*, and Western harvest mouse *(Reithrodontomys megalotis)*. Grassland birds include rough-legged hawk *(Buteo lagopus)*, prairie falcon (*Falco mexicanus*), Western kingbird *(Tyrannus tyrannus)*, Western bluebird *(Sialia mexicana)*, and vesper sparrow *(Pooecetes gramineus)* (USAFA 2008).

Riparian

Mammals common to the riparian communities are white-tailed deer, beaver *(Castor canadensis)*, several bat species, muskrat *(Ondatra zibethica)*, gray fox *(Urocyron cinereoargenteus)*, cottontail rabbit, raccoon *(Procyon lotor*), meadow vole *(Microtus pennsylvanicus),* Montane shrew *(Sorex monticolus),* and Preble's meadow jumping mouse (PMJM) *(Zapus hudsonius preblei)*. Representative birds occurring in or near riparian areas include great blue heron *(Ardea herodias)*, spotted sandpiper *(Actitis hypoleucos)*, orange-crowned warbler *(Vermivora celata)*, common yellowthroat *(Geothylpis trichas)*, Wilson's warbler *(Wilsonia pusilla*), yellow warbler (*Dendroica petechia)*, American goldfinch (*Carduelis tristis)*, and broad-tailed hummingbird (.*Selasphorus platycercus).* Chorus frog *(Pseudacris triseriata)*, northern leopard frog *(Rana pipiens)*, and other amphibians also live in the riparian areas (USAFA 2008).

Aquatic Habitats

The USAFA's coldwater perennial streams (West Monument and Stanley Creek) support reproducing populations of brook trout (*Salvelinus fontinalis*). Six species of native non-game fish occur in the warmer waters of Monument Creek: white sucker *(Catostomus commersoni)*, longnose sucker *(Catostomus catostomus)*, longnose dace *(Rhinichthys cataractae)*, creek chub *(Semotilus atromaculatus)*, brook stickleback (*Culaea inconstans*), and fathead minnow *(Pimephales promelas)* (USAFA 2008).

The Arkansas darter *(Etheostoma cragini)* and greenback cutthroat trout (*Oncorhynchus clarki stomias*) have been extirpated from Monument Creek and its tributaries. Both species have been considered for reintroduction with experimental stocking of greenbacks completed in past years within USAFA waters. The many reservoirs, lakes, and beaver ponds on the USAFA (including Ice Lake) support a variety of water birds such as green-winged teal *(Anas crecca)*, mallard *(Anas platyrhynchos)*, American coot *(Fulica americana)*, Canada goose *(Branta canadensis)*, great blue heron *(Ardea herodias)*, and belted kingfisher *(Ceryle alcyon)*. Many of the reservoirs and lakes are also stocked with hatchery-raised fish, including rainbow trout (*Oncorhynchus mykiss*), brook trout, channel catfish (*Ictalurus punctatus*), German brown trout (*Salmo trutta*), and Snake River cutthroat trout (*Oncorhynchus clarki*) to support the recreational

fishing program. Sterile hybrid grass carp (*Ctenopharyngodon idella*) are also stocked to control aquatic weeds (USAFA 2008).

3.4.3 Protected Species

Birds of Conservation Concern

The USFWS has identified birds of conservation concern for the two Bird Conservation Regions occupied by the USAFA (USFWS 2002). These regions include Bird Conservation Region 16 (Southern Rockies/Colorado Plateau) and Bird Conservation Region 18 (Shortgrass Prairie). The following bird species of conservation concern for Bird Conservation Regions 16 and 18 have been reported on the USAFA: Northern Harrier (*Circus cyaneus*), Swainson's Hawk (*Buteo swainsoni*), Ferruginous Hawk (*Buteo regalis*), Golden Eagle (*Aquila chrysaetos)*, Peregrine Falcon (*Falco peregrinus)*, Prairie Falcon (*Falco mexicanus)*, Mountain Plover (*Charadrius montanus***)**, Long-billed Curlew *(Numenius americanus),* Solitary Sandpiper (*Tringa solitaria)*, Marbled Godwit (*Limosa fedoa)*, Wilson's Phalarope (*Phalaropus tricolor)*, Yellow-billed Cuckoo (*Coccyzus americanus)*, Burrowing Owl (*Athene cunicularia***)**, Short-eared Owl (*Asio flammeus)*, Lewis' Woodpecker (*Melanerpes lewis)*, Williamson's Sapsucker (*Sphyrapicus thyroideus)*, and Virginia's Warbler (*Vermivora virginiae*)(USFWS 2008).

Rare Plant Species

Based on a vegetation study by USAFA staff in 1994 and botanical surveys by the CNHP in 1993 and 2002, the following state-listed, or otherwise rare plant species, occur on the USAFA: Plains Ironwood (*Vernonia marginata*), Frostweed (*Crocanthemum bicknellii*), Waterwort (*Elatine rubella*), Small-leaved Leadplant (*Amorpha nana*), Rattlesnake-Plantain (*Goodyera repens*), Gummy Lovegrass (*Eragrostis curtipedicellata*), False Melic Grass (*Schizachne purpurascens*), American Currant (*Ribes americanum*), Streaked Ragweed (*Ambrosia linearis*), Rocky Mountain Blazing Star (*Liatris ligulistylis*), and Rocky Mountain Cinquefoil (*Potentilla ambigens*) (USAFA 2008).

Species of Special Concern and Habitats at the USAFA

In 1996, the CNHP identified rare or species of special concern that occur on the USAFA and prioritized these resources in terms of rarity on a global or state rank (Ellington et al. 1996). Seven sites were identified as significant natural heritage (conservation) wildlife resources, including Monument Creek. This area was identified as being of very high significance for biodiversity, and the area contains habitat for the following significant species: PMJM, Hops azure butterfly (*Celastrina humulus*), southern Rocky Mountain cinquefoil (*Potentilla ambigens*), New Mexico cliff fern (*Woodsia neomexicana*), cedar waxwing (*Bombycilla cedrorum*), gray catbird (*Dumatella carolinesis*), and northern leopard frog.

Threatened or Endangered Species

Threatened and endangered species are federally protected plants and animals that are in danger of becoming extinct. Such species are threatened or endangered for a variety of reasons, mainly due to specialized habitat needs or habitat destruction. The Federal Endangered Species Act (ESA) of 1973 protects listed species against any action that would adversely affect them, including "taking," defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Further, any adverse impact on the habitat of a listed species is strictly prohibited. All DOD installations are required to perform threatened and endangered species surveys periodically and prior to any activities that disturb land potentially occupied by listed species. The USAFA has completed extensive surveys to document the status of rare species, including natural areas inventories, significant natural heritage resources surveys, and annual Preble's meadow jumping mouse surveys since 1997. In addition, numerous biological inventories and surveys have been

conducted by faculty members and cadets in the USAFA's Department of Biology (USAFA 2002).

According to an USFWS list of updated Federal and State of Colorado threatened, endangered, special concern, and candidate species, the following species occur or could occur in El Paso County, Colorado: Arkansas darter (*Etheostoma cragini*), Black-footed ferret (*Mustela nigripes*), Greenback cutthroat trout (*Oncorhynchus clarki stomias*), Gunnison's prairie dog (*Cynomys gunnisoni*), Interior least tern (*Sternula antillarum*), Mexican spotted owl *(Strix occidentalis lucida),* Pallid sturgeon (*Scaphirhynchus albus*), Piping plover *(Charadrius melodus),* PMJM*,* Ute ladies' tresses orchid *(Spiranthes diluvialis),* and Whooping crane (*Grus americana*).

According to a graphic provided by the USAFA, PMJM habitat exists along the Monument Creek and West Monument Creek drainages. A reproduction of this graphic is provided as Figure 7.

3.5 Cultural Resources

Baseline inventories of cultural resources at the USAFA were completed in 1996, and a cultural resources management plan has been completed. In July 1995, the Colorado State Historic Preservation Office (SHPO) determined that the Air Force USAFA campus is eligible for listing on the National Register of Historic Places (NRHP). That determination, which includes the landscape boundaries of the original 1955 *Master Plan*, was based on the unique combination of natural and built elements found on the USAFA. Although no official decision has been made with regard to nominating the Service and Supply Area to the NRHP, natural resource managers must now more fully consider the significance of the USAFA's cultural resources and associated viewsheds, and ensure that their management actions do not adversely impact cultural resources.

3.6 Socioeconomic Resources

Socioeconomic resources to be considered for the Service and Supply Area redundant fiber optic routing project include socioeconomic setting, recreation, Environmental Justice, hazardous waste and hazardous materials, land use, noise, and transportation. Each of these issues is discussed below.

3.6.1 Socioeconomic Setting

The USAFA contributes significantly to the economy of El Paso County, Colorado. The USAFA's annual economic impact on this region totals approximately $470 million, with an estimated 9,739 military and civilian jobs created by USAFA activities. The primary source for these data is the U.S. Air Force Academy Economic Impact Analysis, 1998. According to the 2000 U.S. Census Bureau, the USAFA population is approximately 7,526 persons. The population of El Paso County in 2008 was 596,053. El Paso County's median household income in 2008 was $59,216 and with an unemployment rate of 5.7 percent in 2004. Approximately 78 percent of the population are employed in the private sector, 14 percent are employed by the government, and 7 percent are self-employed (City Data 2009). The operation of the USAFA makes an important contribution to the economy of the region through direct employment and purchases from local businesses.

3.6.2 Recreation

The New Santa Fe Trail is an unpaved multi-use recreational trail that winds through the USAFA property, and follows the Monument Creek drainage through the Service and Supply Area (see Figure 2). This trail is operated and maintained by El Paso County through a lease agreement with the USAFA. It is open to the public and is part of the Colorado Front Range Trail, which will stretch from Wyoming to New Mexico when all sections of the trail have been constructed.

3.6.3 Environmental Justice

Pursuant to Executive Order 12898, prior to initiating activities that may impact the environment, Environmental Justice issues must be evaluated. These considerations are designed to focus attention on the human health and environmental conditions in minority and low-income communities. Concentrated areas of low income, minority, and/or disadvantaged residents do not exist within the USAFA. As a result, Environmental Justice issues would not be expected to occur and need not be further evaluated in this EA.

3.6.4 Hazardous Wastes

Activities at the USAFA generate small quantities of hazardous waste (100 to 1,000 kilograms per month). For this reason, the USAFA has an approved Hazardous Waste Management Plan. Hazardous waste is stored onsite for up to 90 days before it is removed to a TSD facility by a Defense Reutilization and Marketing Office (DRMO) contractor. During the 90-day accumulation period, the waste is stored at the Hazardous Waste Site in Building 8125 within the Service and Supply Area. Biomedical wastes are also generated in small quantities at the USAFA, which are collected and disposed of appropriately off site by an approved contractor (USAFA, 2002).

3.6.5 Hazardous Materials

In addition to hazardous wastes, a variety of hazardous materials are stored and managed at the USAFA. A thorough spill prevention program has been developed to minimize any potential for environmental releases, and copies of appropriate Material Safety Data Sheets (MSDSs) can be obtained from the HAZMAT Pharmacy, the USAFA Fire Department, and individual contractor shops. Specific types of hazardous materials that may be present on site include pesticides and herbicides. Pesticide and herbicide application at the USAFA is conducted by certified contractors (USAFA, 2002).

3.6.6 Storage Tanks

The USAFA uses a number of on-site underground storage tanks (USTs), aboveground storage tanks (ASTs), and non-regulated heating plant tanks for storage of various hazardous materials. Sixteen USTs at the USAFA hold diesel fuel, waste oil, aviation gas, and gasoline. The 28 ASTs are double-walled steel vessels, providing secondary self-containment (USAFA, 2002).

3.6.7 Land Use

The USAFA contains approximately 18,455 acres, with an additional 652 acres at the Farish Recreation Area. Although the USAFA is generally open to public access (with the exception of the Jack's Valley Training Area), it has been withdrawn from all forms of appropriation under public land laws, including mining and mineral lease laws, and reserved for use by the Air Force for cadet training and education (USAFA, 1995b).

The constructed portions of the Service and Supply area are used for industrial, administrative, and academic purposes. The undeveloped portions of this area have been preserved as natural and general open space along Monument Creek and the New Santa Fe Trail.

3.6.8 Noise

Noise environments are characterized by existing ambient noise levels, noise sources, locations of noise-sensitive land uses near the proposed project, and terrain that could provide potential noise barriers.

Noise levels at the USAFA are generally low at most times. Existing land use patterns suggest that ambient levels would likely be below 40 decibels on the A-weighted scale (dBA) in undeveloped areas (USEPA, 1971a). Levels would be somewhat higher in areas near major roadways, such as South Gate Boulevard, and near major activity areas, such as the constructed portions of the Service and Supply Area.

3.6.9 Transportation

The Service and Supply Area is bound by South Gate Boulevard and Stadium Drive on the north, by South Gate Boulevard on the east, by Park Drive on the southeast and generally by unpaved access roads on the south and west (Figures 2 & 4). The unpaved road to the west provides public access to the New Santa Fe Trail trailhead and to a parking lot for Ice Lake users. Industrial Drive, Security Drive, Edgerton Drive, and Park Drive provide access to the Service and Supply Area buildings for use by USAFA staff, cadets, and guests. South and west of the Service and Supply Area building complex, Park Drive provides access to an additional picnic and parking area for access to the New Santa Fe Trail, as well as two recreational vehicle storage lots that are open to the public and to USAFA employees and cadets.

4.0 IMPACTS AND MITIGATIONS

Two alternatives have been developed for the proposed redundant fiber optic diverse route in the Service and Supply Area of the USAFA and retained for detailed evaluation. The No Action Alternative would involve no additional fiber optic line through the Service and Supply Area. The Preferred Alternative would route the new line along the New Santa Fe Trail and existing roads in a way to minimize the overall disturbance of native vegetation/wildlife habitat within the Service and Supply Area. Alternative B would route the line in such a way as to minimize the impact to the New Santa Fe Trail by routing the line from the foot bridge west to the railroad access road.

The discussion below focuses on impacts from construction of the fiber optic line and its ongoing presence in the area. The alternatives have no long term significant impacts to environmental resources; however, minor and temporal impacts identified through this study will be reduced through compliance with “Overarching Environmental Specifications – United State Air Force Academy” and standard quality construction measures implemented during construction.

4.1 Climate and Air Quality

4.1.1 Climate

None of the three alternatives considered will have an impact on climate.

4.1.2 Air Quality

No Action Alternative
This alternative would have no impact on air quality.

Preferred Alternative and Alternative B
During construction, both alternatives will have minor and transitory impacts on air quality. These impacts will primarily be associated with particulate releases during the digging of the trench for the fiber optic line and from any vehicular traffic that disturbs the vegetative cover of the land surface. In addition, vehicular exhaust from equipment used during the construction activities will temporarily diminish air quality. None of the emissions are expected to be substantial, and none will extend beyond the construction/reclamation period, which is expected to be less than six months. Because the area of disturbance is estimated to be less than 25 acres and the disturbance period will be less than six months, the activity is exempt from Colorado Department of Public Health and Environment (CDPHE) permitting and reporting requirements. Standard mitigation measures for construction such as minimizing areas of disturbance, watering areas that must be disturbed and rapid reclamation of disturbed areas should be employed. These measures will minimize potential contributions of this project to the occasional PM_{10} exceedances that occur in the vicinity of the USAFA.

4.2 Geology and Soils

4.2.1 Geology

No Action Alternative
The No Action Alternative will have no impact on geology.

Preferred Alternative
The Preferred Alternative will have no impact on geology.

Alternative B
Because of the lack of space available in previously disturbed areas along the rail access road, Alternative B would require that the fiber optic line trench be constructed along the western side of the road. This area exhibits exposed rock outcroppings that will need to be removed and drilled to accommodate the trench line. Although the expected impacts to the USAFA's geology could not be completely mitigated by reclamation techniques after construction; the affected area is relatively small when compared to the overall geology of the area. Therefore, the impact of Alternative B on the Academy's geology would not be considered significant.

4.2.2 Soils

No Action Alternative
The No Action Alternative will have no impact on soils.

Preferred Alternative and Alternative B
Installation of the fiber optic line under the Preferred Alternative and Alternative B will penetrate the soil where the line will be laid. Any use of heavy equipment along the trench corridor will also disturb the soil surface. These alternatives will not have a significant impact to soil because construction will require compliance with "Overarching Environmental Specifications – United State Air Force Academy" and standard quality construction practices. The potential for disturbed surface soil to become windblown or erode can be reduced through the use of rapid reclamation techniques after construction, including backfilling the trench as the cable is laid. These impacts will be localized and insignificant.

4.3 Water Resources

No Action Alternative
The No Action Alternative will have no impact on water resources.

Preferred Alternative and Alternative B
The USAFA has identified Waters of the United States (WUS) including wetlands existing within the 10-year flood plain of Monument Creek. The Preferred Alternative and Alternative B propose to suspend the fiber optic cable underneath the pedestrian bridge over Monument Creek. Because bridge optical cable suspension will not require directional boring, or trenching and filling within Waters of the U.S, wetlands and WUS will not to be impacted by any of the Alternatives under consideration in this EA.

These alternatives will not have a significant impact to water because construction will require compliance with "Overarching Environmental Specifications – United State Air Force Academy" and standard quality construction practices. The potential for temporary impacts to water quality during construction could occur from erosion of soil but can be reduced through the use of rapid reclamation techniques after construction, including backfilling the trench as the cable is laid. These impacts will be localized and insignificant.

4.4 Biological Resources

4.4.1 Vegetation Resources

No Action Alternative
The No Action Alternative will have no impact on vegetation resources.

Preferred Alternative
The Preferred Alternative stays along roadways and foot paths that have already been cleared of vegetation, thus eliminating any potential for impacts to vegetation resources.

Alternative B
Along the trench corridor, grasses and forbs are expected to be removed in areas where the trench line must pass through previously undisturbed areas and where heavy equipment travels. However, these impacts will be localized and insignificant. Impacts under Alternative B are expected to be greater because it passes through undisturbed areas along the western edge of the rail access road. However, Alternative B will not have a significant impact to biological

resources because construction will require compliance with "Overarching Environmental Specifications – United State Air Force Academy" and standard quality construction practices. The removal of grasses and forbs will be transitory and insignificant and implementation of rapid reclamation techniques after construction will reduce such effects to insignificant on vegetation resources.

4.4.2 Wildlife Resources

No Action Alternative
The No Action Alternative will not impact wildlife resources.

Preferred Alternative
The Preferred Alternative stays along roadways and foot paths that have already been cleared of vegetation, thus eliminating any potential for impacts to wildlife resources from disturbance of cover and foraging sites.

Alternative B
Along the trench corridor, grasses and forbs are expected to be removed in areas where the trench line must pass through previously undisturbed areas and where heavy equipment travels. To a minor degree, removal of woody vegetation along and adjacent to the line route will diminish cover and foraging sites for various wildlife species. However, these impacts will be localized and insignificant. Impacts under Alternative B are expected to be greater because it passes through undisturbed areas along the western edge of the rail access road. However, Alternative B will not have a significant impact to wildlife resources because construction will require compliance with "Overarching Environmental Specifications – United State Air Force Academy" and standard quality construction practices. The removal of grasses and forbs will be transitory and insignificant and implementation of rapid reclamation techniques after construction will reduce such effects on wildlife resources.

4.4.3 Protected Species

No Action Alternative
The No Action Alternative will not impact wildlife resources.

Preferred Alternative
A "no effect" determination for the Preferred Alternative was made by USAFA and the Academy asked the USFWS for concurrence. The USFWS provided no response to the January 21, 2010 email concerning the "no effect" determination; therefore it is assumed that they have concurred with this decision. No mitigations are necessary or proposed because the disturbance will be contained within the road and trail and under the Monument Creek footbridge. A copy of this email correspondence to USFWS requesting concurrence is included in Appendix B.

Alternative B
The only protected species known to occur in the immediate vicinity of the proposed fiber optic line construction project is the PMJM. According to CNHP surveys, the natural habitat for this species includes land in a buffer zone extending 300 feet on either side of the stream channel midline of Monument Creek and West Monument Creek (see Figure 7). Alternative B traverses through this defined habitat which could be impacted by construction and the disturbance of natural vegetated areas. Mitigation measures would be necessary and an Endangered Species Act consultation with USFWS would be required.

4.5 Cultural Resources

No Action Alternative
The No Action Alternative will have no impact on cultural resources in the area.

Preferred Alternative and Alternative B
Areas to be traversed by the trench under either the Preferred Alternative or Alternative B do not contain any known pre-historic sites.

Construction of the fiber optic line under either the Preferred Alternative or Alternative B would not be expected to harm the historic character of the Service and Supply Area portion of the campus in any physical or permanent way. Because the fiber line would be buried, cultural resources and viewsheds would not be impacted.

4.6 Socioeconomic Resources

4.6.1 Socioeconomic Setting

No Action Alternative, Preferred Alternative, and Alternative B
None of the three alternatives considered are expected to have a significant impact on the general socio-economic setting of the USAFA.

4.6.2 Recreation

No Action Alternative
The No Action Alternative will have no impact on recreational resources.

Preferred Alternative
Access to the New Santa Fe Trail will be partially restricted during the construction of the fiber optic line under the Preferred Alternative. This alternative will also potentially impact access to the Ice Lake and New Santa Fe Trail parking areas when the fiber optic line is being installed through the parking area and along the dirt access road to the substation. Because the trail is leased from the USAFA by El Paso County, consultation with the county was initiated. According to Jason Meyer, Park Planner with the El Paso County Parks Division, the easement agreement between the USAFA and El Paso County states that the USAFA has the rights to access the trail for any utility use. Therefore, Mr. Meyer stated that the USAFA will not need access agreements from the County to trench along the New Santa Fe Trail. However, Mr. Meyer stated that parking lot and trail signage describing the construction activities and timeline will need to be posted two weeks before construction begins.

Alternative B
Access to the New Santa Fe Trail will be partially restricted during the construction of the fiber optic line under Alternative B. However, impacts to the Trail would be slightly less under Alternative B because this route follows the Trail path from Park Drive over the foot bridge only. This alternative will also potentially impact access to the Ice Lake and New Santa Fe Trail parking areas and trail when the fiber optic line is being installed along the dirt access road to the substation.

4.6.3 Environmental Justice

No Action Alternative, Preferred Alternative and Alternative B
Because there are no concentrated areas of low income, minority, or disadvantaged residents at the USAFA, none of the three alternatives are expected to cause Environmental Justice issues.

4.6.4 Hazardous Wastes

No Action Alternative, Preferred Alternative and Alternative B
It is highly unlikely that hazardous wastes will be encountered or generated during the trenching activities, or as a result of not installing the fiber optic line. Nevertheless, any hazardous wastes encountered during the redundant fiber optic line project will be handled fully in accordance with the USAFA's approved Hazardous Waste Management Plan.

4.6.5 Hazardous Materials

No Action Alternative
Hazardous materials will not be produced or used as a result of the No Action Alternative.

Preferred Alternative and Alternative B
Heavy equipment and other vehicles associated with the trench line construction will contain hazardous materials such as motor oil and gasoline that could spill on the ground in small quantities as a result of mechanical failures of construction equipment and human error. However, these impacts will be localized and insignificant because construction will require compliance with “Overarching Environmental Specifications – United State Air Force Academy” and standard quality construction practices.

4.6.6 Storage Tanks

No Action Alternative, Preferred Alternative and Alternative B
No storage tanks are located within the planned trench line corridor under either the Preferred Alternative or Alternative B.

4.6.7 Land Use

No Action Alternative, Preferred Alternative and Alternative B
None of the three alternatives considered will impact established land use practices for the Service and Supply Area.

4.6.8 Noise

No Action Alternative
No construction noise will be created by enacting the No Action Alternative.

Preferred Alternative and Alternative B
Noise impacts from the two trenching alternatives will be limited to the construction period. Noise will result from the use of mechanized equipment to excavate the trench and clear vegetation in its path. Quality construction practices will minimize such noise. It is not expected to be more than a minor and transitory annoyance under either the Preferred Alternative or Alternative B.

4.6.9 Transportation

No Action Alternative
No impacts to transportation would occur by enacting the No Action Alternative.

Preferred Alternative
Use of Park Drive and the dirt access roads will be constrained during the construction period. Pedestrians and bicyclists using the New Santa Fe Trail will be impacted during the construction period, as well. However, these impacts will be localized and insignificant because construction will require compliance with "Overarching Environmental Specifications – United State Air Force Academy" and standard quality construction practices. The construction period is only expected to last two to three days, and reclamation of the areas impacted by the trenching activities is expected to happen immediately following installation of the fiber optic line.

Alternative B
Alternative B will also impact transportation along Park Drive, dirt access roads, and the New Santa Fe Trail. However, a portion of Alternative B follows an access road that is off-limits to the general public from below Ice Lake to the intersection of the road with the main unpaved access road. Therefore, transportation impacts for the general public are considered to be slightly less under Alternative B.

4.7 Conclusions and Mitigation

The No Action Alternative would have no impacts to environmental resources.

The Preferred Alternative routes the new communications line to provide the required redundancy to the base's communication system from Building 8130 in the Service and Supply Area to the south electrical substation off Park Drive. The fiber optic line will be placed in a shallow trench excavated within the mow track or dirt roadway edge and along the New Santa Fe Trail corridor. All spoils from the trench will be stockpiled on the trail or road for backfilling the excavation. The crossing of Monument Creek will be accomplished by routing the fiber optic cable through a conduit attached to the footbridge. This will eliminate impacts to wetlands, floodplains, and Preble's Meadow Jumping Mouse habitat.

Alternative B routes the new communications line through the mapped habitat of the PMJM along Monument Creek and West Monument Creek. This alternative also impacts previously undisturbed habitat along the western edge of the rail road access road. The terrain along the western side of the access road is rocky with significant woody vegetation. Because of the terrain conditions through this section, Alternative B would be difficult to trench, and may extend the construction period of the project. Impacts associated with the construction phase of the project would increase, including noise impacts, air quality associated with mechanized equipment emissions and fugitive dust, increased potential for petroleum spills or releases from the construction equipment used, and wildlife disturbance.

The Preferred Alternative incurs less environmental disturbance than Alternative B because it is limited to previously disturbed trails and roadways. Under Alternative B, the construction period for installing the line would be longer, and would impact previously undisturbed natural areas of the USAFA. For these reasons, the Preferred Alternative meets the requirements of the DOD standards because it will disturb the least amount of the USAFA's environment as possible.

No mitigation measures are required for the Preferred Alternative. Best management practices would be required to be implemented for both the Preferred Alternative and Alternative B to

prevent or minimize the potential for environmental impacts. These best management practices would require the USAFA and/or its contractors to:

1. Incorporate and follow the "Overarching Environmental Specifications – United States Air Force Academy" to ensure that environmental impacts are minimized during project construction.

2. Practice standard quality construction measures pertaining to erosion such as minimizing areas of disturbance, watering areas that must be disturbed, use of “silt dams” to minimize sheet flow of water and silt, and rapid, successful reclamation.

3. Confine all heavy equipment associated with trenching activities to paved or disturbed surfaces whenever possible.

4. Install the redundant communications line using a minimum of heavy equipment, relying on equipment carried by hand or by small vehicles.

5. Implement the spill prevention program during construction activities to avoid spills of motor oil, gasoline, or other wastes from the site.

6. Implement standard quality construction measures pertaining to noise minimization such as the use of mufflers on mechanical equipment and avoidance of construction during time periods when noise would be particularly intrusive (e.g., on weekends when trail use may be higher).

4.8 Cumulative Impacts

The USAFA is planning to construct and install an 80-acre solar panel array on the base. The preferred location of the solar array would be located east of the Service and Supply area near the South Gate entrance. The preferred electrical tie-in route for this project includes trenching conduit from the South Gate Entrance along to Park Drive, then trench along Park Drive to its terminus, where the line would then follow existing overhead electrical connections to the South Substation.

Cumulative impacts anticipated in conjunction with the Preferred Alternative and the solar array conduit would be limited to the construction phase of each project, when the conduit is being installed in subsurface trenches, and would be temporary in nature. BMPs highlighted throughout this document that will be used during the construction of the Preferred Alternative to minimize impacts to resources in the vicinity will also apply to the solar array construction activities. Both the USAFA’s proposed redundant fiber optic communications line and the majority of the solar array electrical line will be laid underground, and the areas directly impacted by the trenching activities will be restored to preconstruction conditions as much as possible after the construction activities are complete. Therefore, no lasting cumulative impacts are anticipated to be associated with this project.

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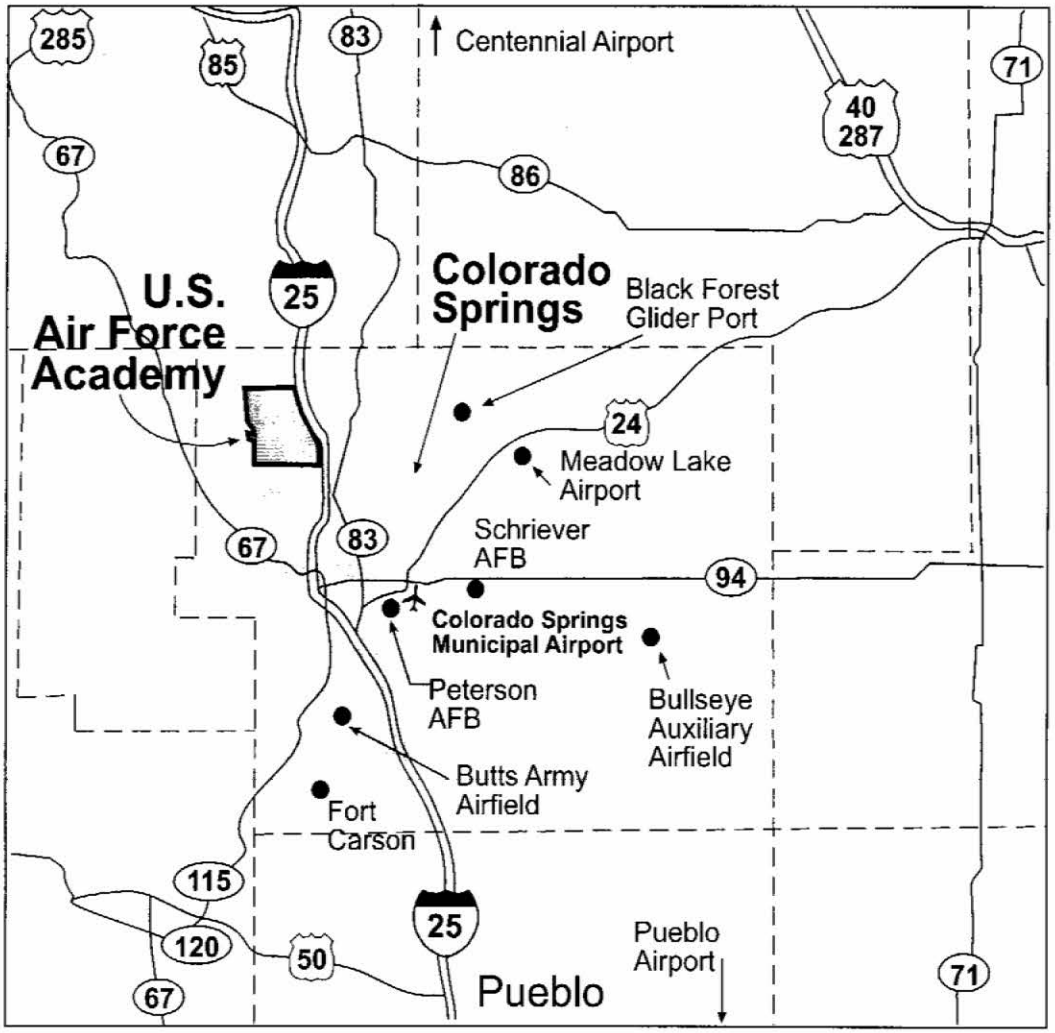
APPENDIX A

FIGURES



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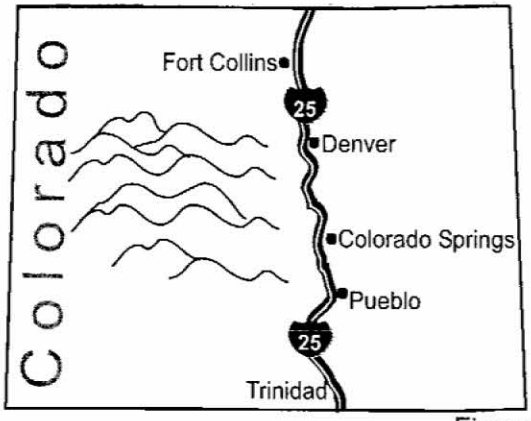

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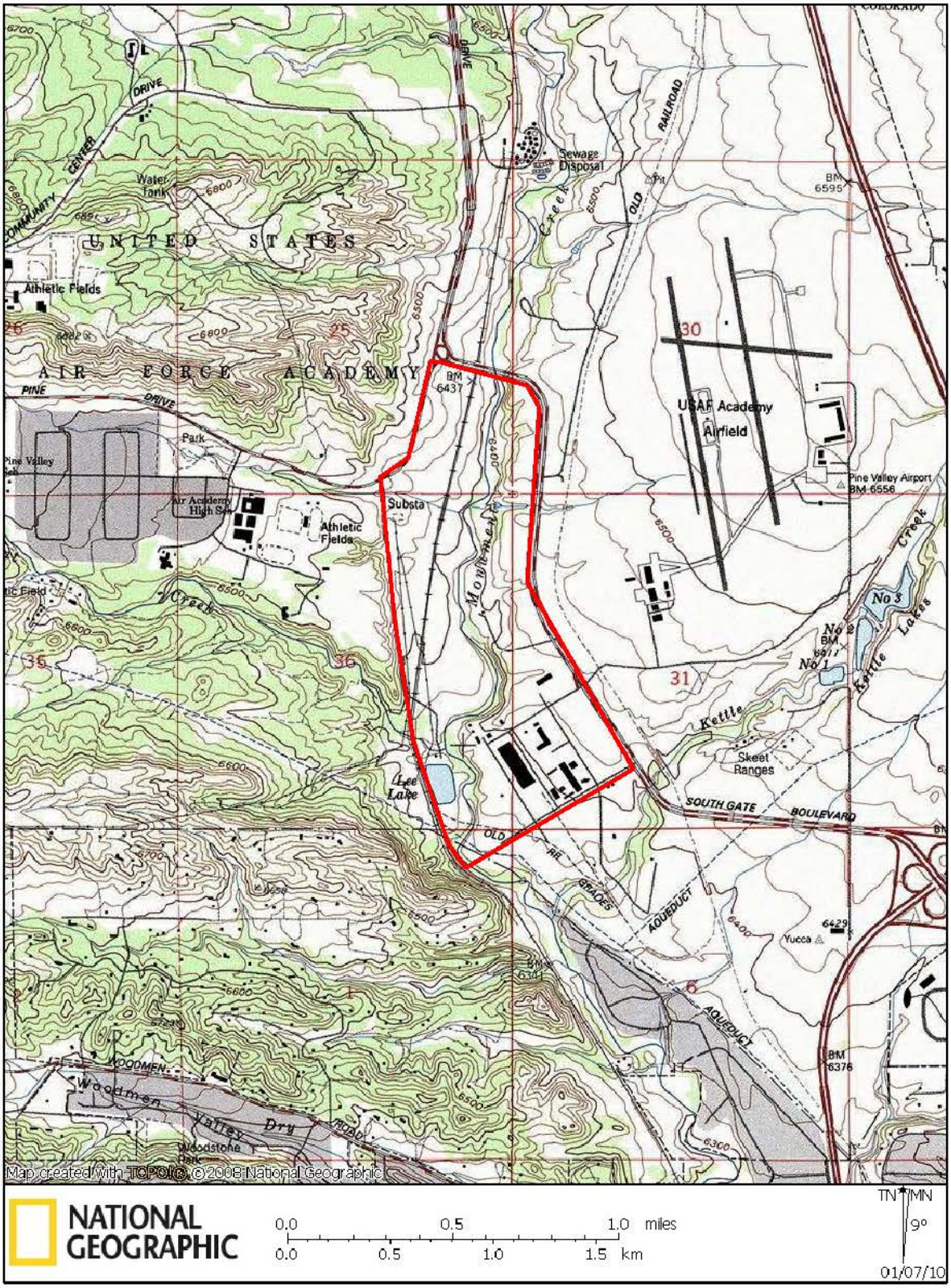
Figure 1-1
Location of Air Force Academy and Other Airfields

DEN/R/156234.PP.01/Figure1_1/6-01

Project Mngr: SH	Project No. 23097108	Terracon Consulting Engineers and Scientists	SITE DIAGRAM	FIG. No.
Drawn By: SH	Scale: NTS	10625 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE	1
Checked By: RP	File No. 23097108/ FIG_1	PH. (303) 423-3300 FAX. (303) 423-3353	UNITED STATES AIR FORCE ACADEMY	
Approved By: RP	Date: 01-06-10		COLORADO SRPINGS, COLORADO	



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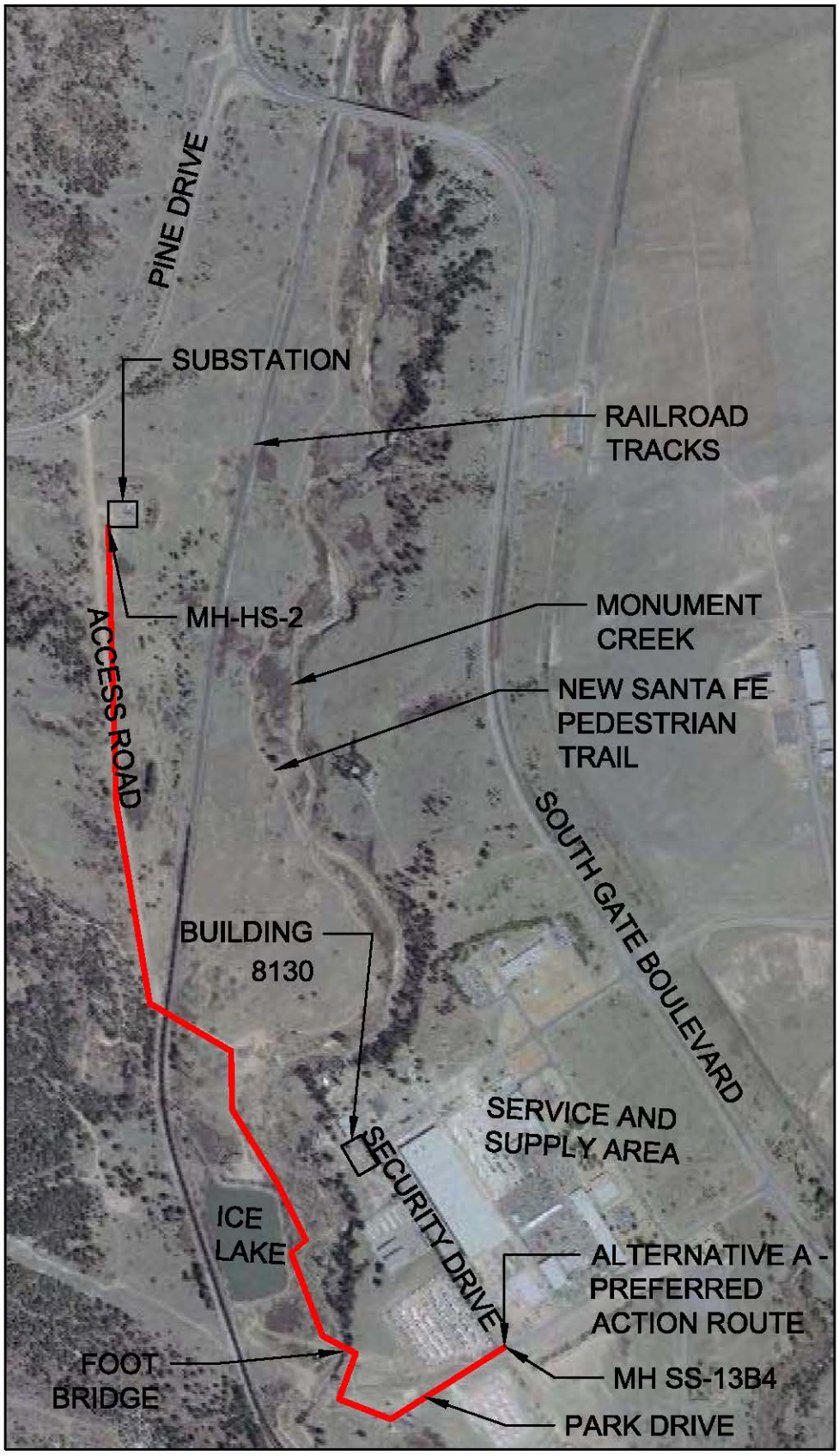
LEGEND

SERVICE AND SUPPLY AREA GENERAL BOUNDARY

Project Mngr: SH	Project No. 23097018	Terracon Consulting Engineers and Scientists	SERVICE AND SUPPLY AREA LOCATION	FIG. No.
Drawn By: SH	Scale: SEE ABOVE	10625 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE	2
Checked By: RP	File No. 23097018/ FIG_2	PH. (303) 423-3300 FAX. (303) 423-3353	UNITED STATES AIR FORCE ACADEMY	
Approved By: RP	Date: 01-06-10		COLORADO SPRINGS, COLORADO	



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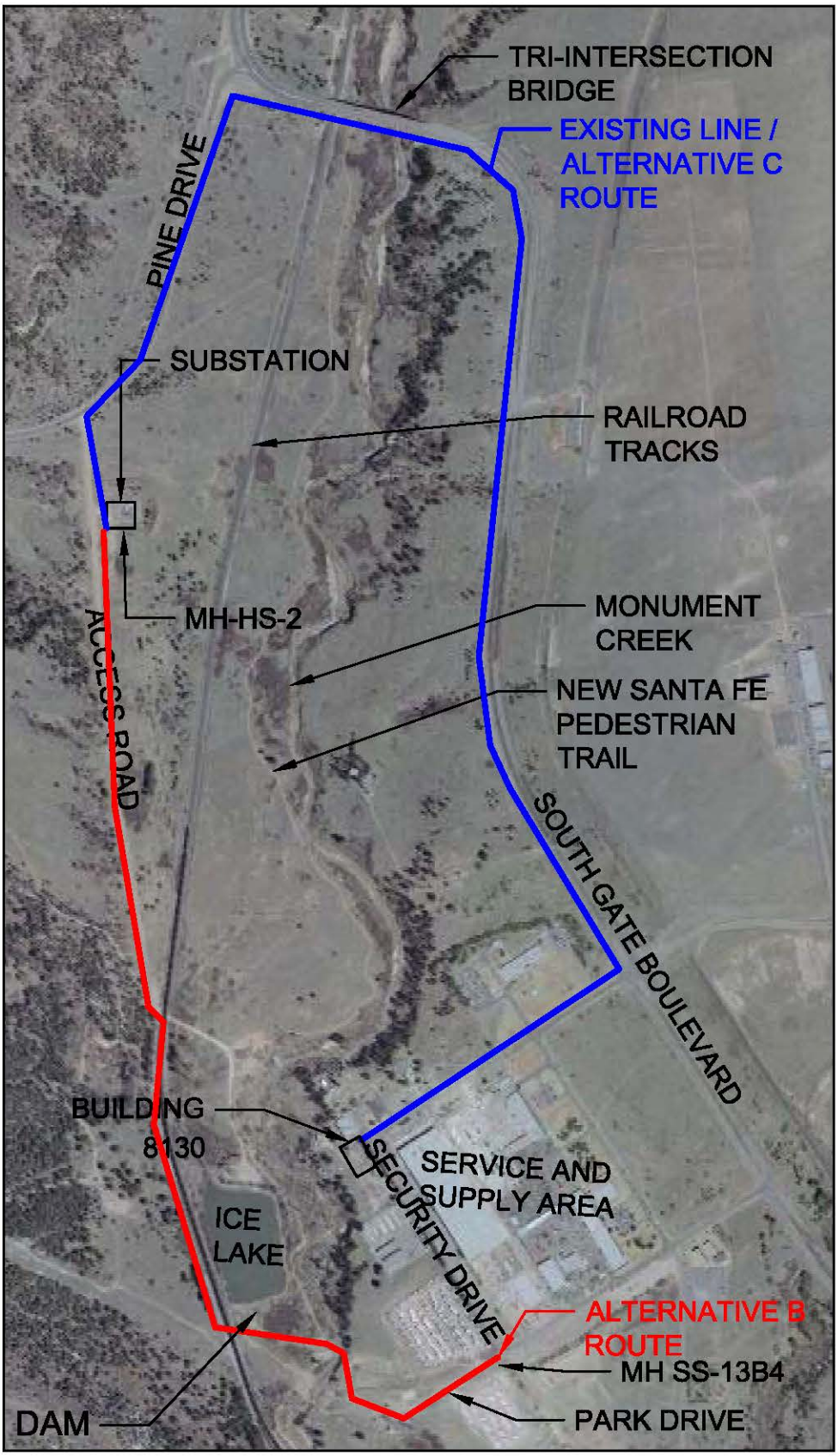
Project Mngr: SH	Project No. 23097018	Terracon Consulting Engineers and Scientists	ALTERNATIVE A - PREFERRED ALTERNATIVE ROUTE
Drawn By: SH	Scale: NTS	10625 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE
Checked By: RP	File No. 23097018/ FIG_3	PH. (303) 422-3300 FAX. (303) 423-3353	UNITED STATES AIR FORCE ACADEMY
Approved By: RP	Date: 01-06-10		COLORADO SPRINGS, COLORADO

FIG. No. 3



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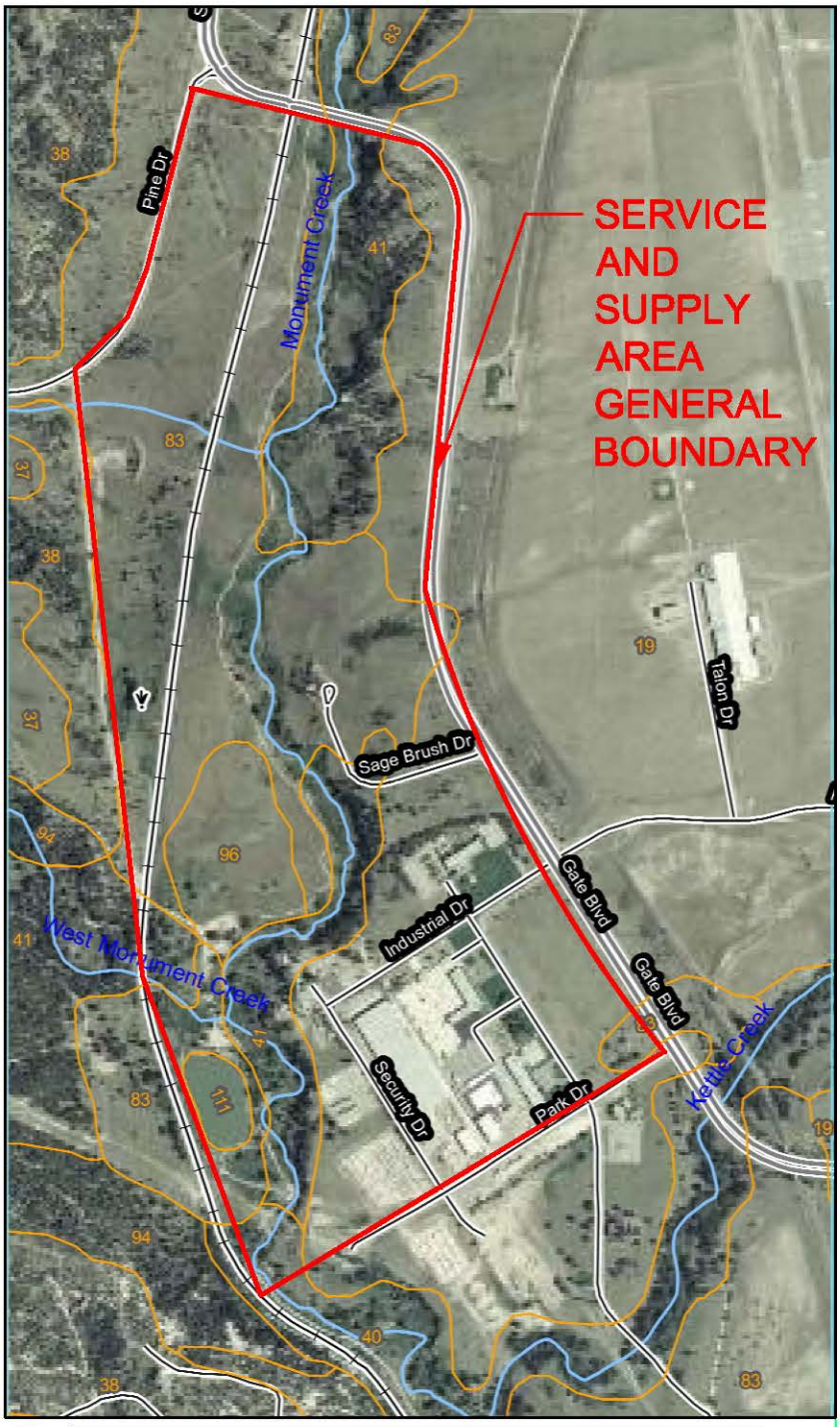
Project Mngr: SH	Project No. 23097108	Terracon Consulting Engineers and Scientists	EXISTING LINE PATH / ALTERNATIVE B & C ROUTE	FIG. No.
Drawn By: SH	Scale: NTS	10625 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE	4
Checked By: RP	File No. 23097108/ FIG_4	PH. (303) 423-3300 FAX. (303) 423-3353	UNITED STATES AIR FORCE ACADEMY	
Approved By: RP	Date: 01-06-10		COLORADO SPRINGS, COLORADO	



El Paso County Area, Colorado (CO625)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	549.5	42.5%
37	Jaxa gravelly sandy loam, 1 to 8 percent slopes	10.9	0.8%
38	Jaxa-Tecolote complex, 8 to 65 percent slopes	103.5	7.8%
40	Kettle gravelly loamy sand, 3 to 8 percent slopes	66.9	5.1%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	153.6	11.9%
67	Peyton sandy loam, 3 to 8 percent slopes	7.0	0.5%
83	Stapleton sandy loam, 3 to 8 percent slopes	325.1	25.2%
91	Travessilla-Rock outcrop complex, 8 to 80 percent slopes	32.1	2.5%
96	Truckton sandy loam, 0 to 3 percent slopes	20.1	1.6%
111	Water	4.9	0.4%
Totals for Area of Interest		1,289.5	100.0%

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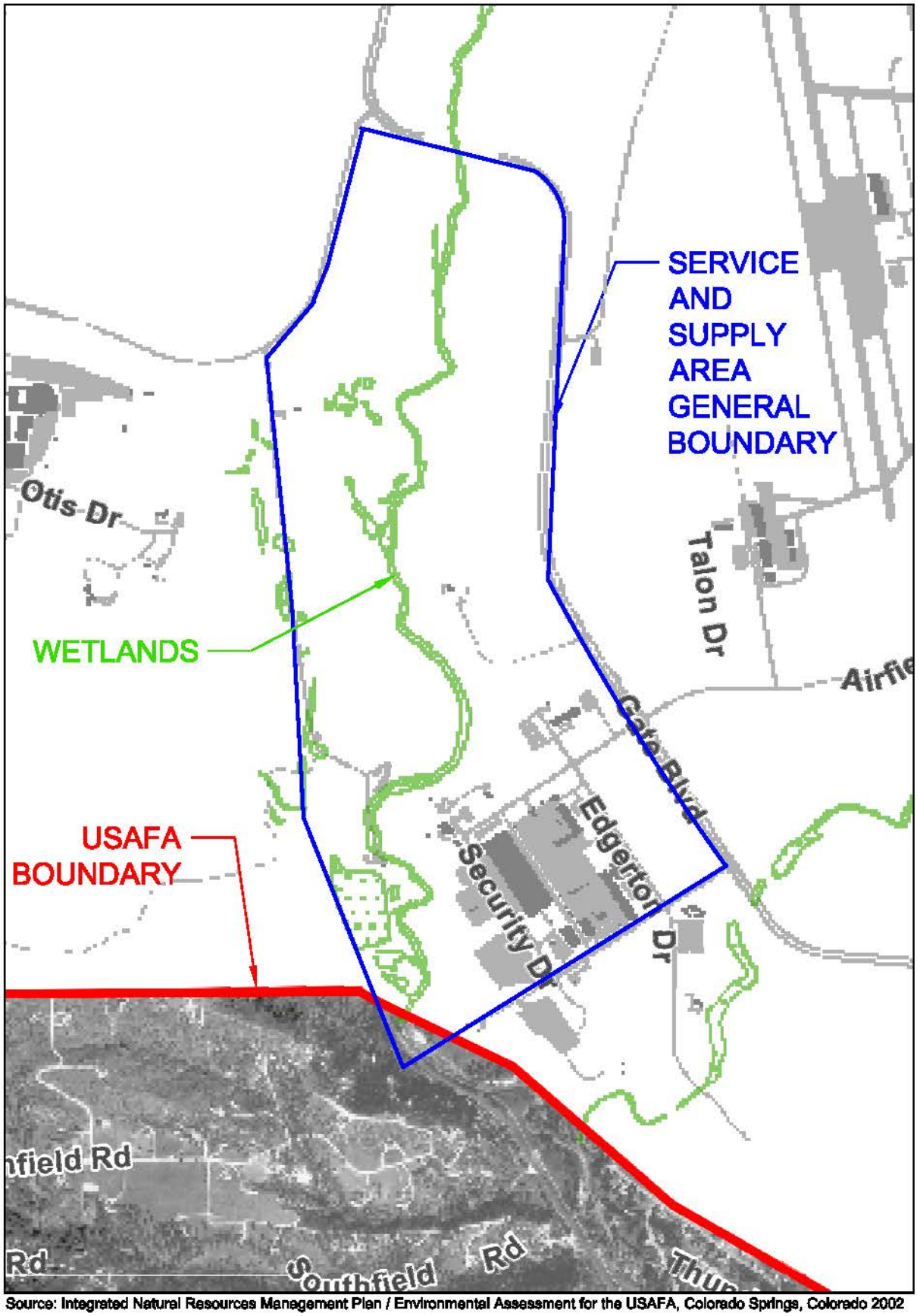
Project Mngr: SH	Project No. 23097108	Terracon Consulting Engineers and Scientists	SOILS MAP
Drawn By: SH	Scale: NTS	10625 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE
Checked By: RP	File No. 23097108/ FIG_5	PH. (303) 423-3300 FAX. (303) 423-3353	UNITED STATES AIR FORCE ACADEMY
Approved By: RP	Date: 01-11-10		COLORADO SRPINGS, COLORADO

FIG. No. 5



Source: Integrated Natural Resources Management Plan / Environmental Assessment for the USAFA, Colorado Springs, Colorado 2002

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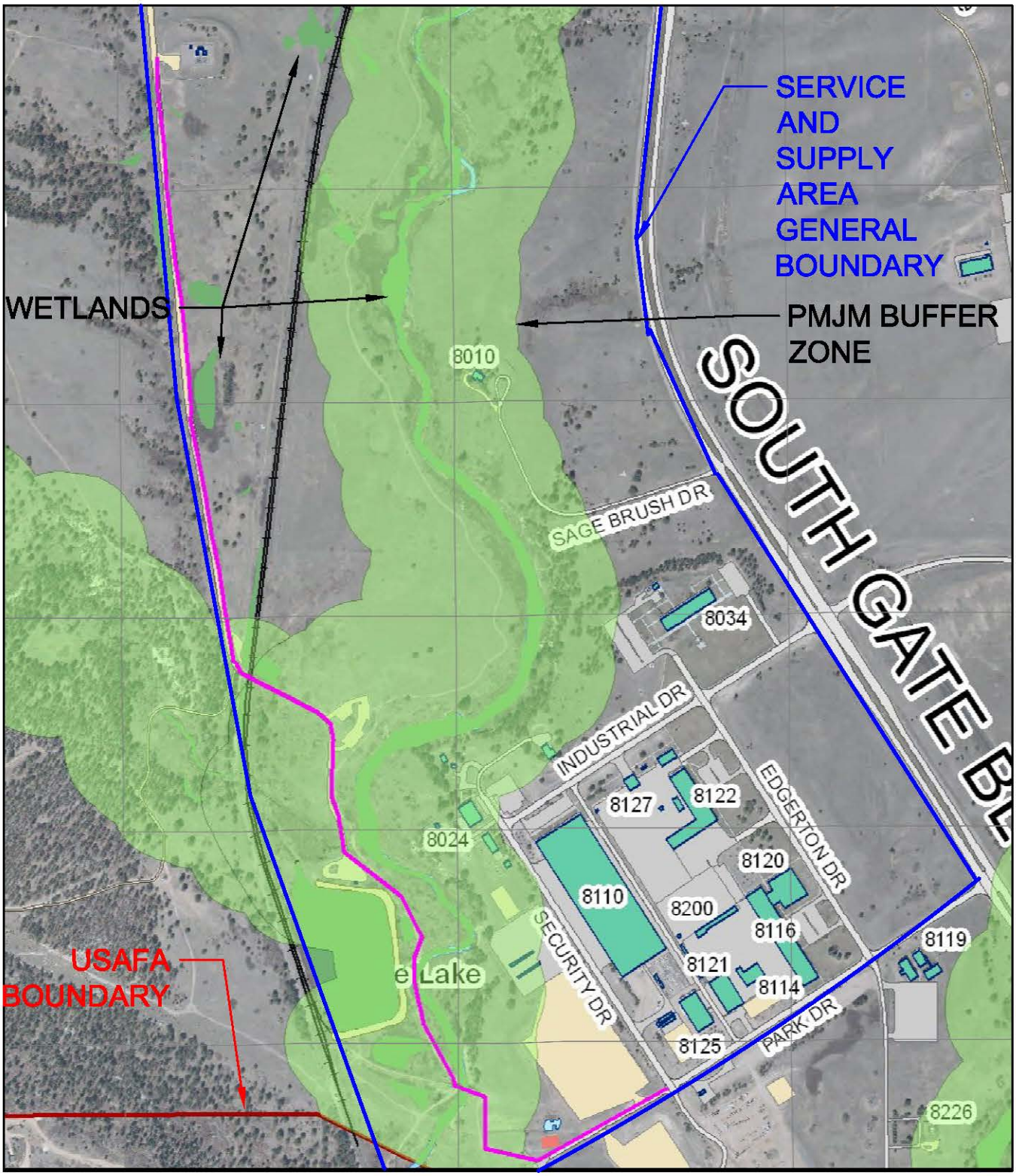
Project Mngr: SH	Project No. 23097108	Terracon Consulting Engineers and Scientists	DELINEATED WETLANDS FROM 2002 USAFA STUDY
Drawn By: SH	Scale: NTS	10625 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE
Checked By: RP	File No. 23097108/ FIG_6	PH. (303) 423-8300 FAX. (303) 423-8303	UNITED STATES AIR FORCE ACADEMY
Approved By: RP	Date: 01-11-10		COLORADO SRPINGS, COLORADO

FIG. No. 6



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Source: USAFA internal mapping software, 2009

Project Mngr: SH	Project No. 23097108	Terracon Consulting Engineers and Scientists	Preble's Meadow Jumping Mouse Buffer and Wetlands Map	FIG. No.
Drawn By: SH	Scale: NTS	10626 W I-70 FRONTAGE RD N, STE 3 WHEAT RIDGE, CO. 80033	FIBER OPTIC DIVERSE ROUTE	7
Checked By: RP	File No. 23097108/ FIG_7	PH. (303) 423-3300 FAX. (303) 423-3353	UNITED STATES AIR FORCE ACADEMY	
Approved By: RP	Date: 01-11-10		COLORADO SRPINGS, COLORADO	

APPENDIX B

SITE PHOTOGRAPHS

Photo #1 View of MH SS-13B4, looking northwest towards the intersection of Park Drive and Security Drive.

Photo #2 View of the preferred trenching route parallel to Park Drive southwest towards the New Santa Fe Trail foot path.

Photo #3 View of the preferred trenching route on the New Santa Fe Trail foot path leading northwest towards the bridge.

Photo #4 View of the footbridge under which conduit would be attached to house the fiber optic line across the bridge.

Photo #5 View of the preferred trenching route on the New Santa Fe Trail, looking south towards the footbridge in Photo #4.

Photo #6 View of the continuation of the preferred trenching route along the New Santa Fe Trail foot path.

Photo #7 View of the preferred trenching route through the Ice Lake and New Santa Fe Trail parking area on the dirt road.

Photo #8 View of the dirt road crossing the train tracks, where the fiber optic line would be installed beneath the tracks.

Photo #9 View of the unpaved access road leading to the electrical substation where the line would be terminated. The line would be laid along the eastern edge of this roadway.

Photo #10 View of MH HS-2 located at the electrical substation, where the preferred fiber optic trenching line would terminate.