ENVIRONMENTAL ASSESSMENT FOR THE UNMANNED AERIAL SYSTEMS TRAINING COMPLEX AT FORT BLISS, TEXAS AND NEW MEXICO

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ENVIRONMENTAL ASSESSMENT
FOR THE UNMANNED AERIAL SYSTEMS TRAINING COMPLEX
AT FORT BLISS, TEXAS AND NEW MEXICO

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DRAFT FINDING OF NO SIGNIFICANT IMPACT

1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Fort Bliss proposes to construct, operate, and maintain a training complex for unmanned aerial systems (UAS) to be used for training of Soldiers for deployment. The Proposed Action would locate the UAS training complex in Training Area (TA) 4D of the Doña Ana Range on Fort Bliss, in Doña Ana and Otero counties, New Mexico. In 2012, Chief of Army Staff General Raymond Odierno directed the Training and Doctrine Command to plan a reorganization that would put a Grey Eagle company in every Army division. The need for the Proposed Action is to comply with the directive and provide training support for the Grey Eagle and other UAS at Fort Bliss and comprehensive and realistic training and range facilities for Soldiers in basic UAS operations within current restricted airspace.

After extensive planning and review, Doña Ana Range TA 4D was selected as being the most suitable location for the UAS training complex.

2.0 DESCRIPTION OF ALTERNATIVES

Proposed Action Alternative

Fort Bliss proposes to construct a new UAS training complex that would include a 5,000-foot-long paved runway and access taxiway for the Grey Eagle UAS and a 1,000-foot-long paved runway for the Shadow UAS, as well as parking areas. A 50,000-square-foot hangar with office and support buildings and a command and control center would be constructed, along with a hot loading facility for munitions deployment and a hazardous materials building. Security fencing and lighting would be installed around the perimeter of the facility, and improvements to the existing Hueco Camp Road would be made, along with new water, fiber-optic, and electrical utilities installed from the Doña Ana Base Camp, McGregor Range Camp, and/or the U.S. Highway 54 corridor. All rights-of-way for utilities would be surveyed for archaeological and natural resources prior to construction. A 1,000-foot-long cleared and graded safety run-out zone would be constructed at each end of the Grey Eagle airfield.

Approximately 119.5 acres would be disturbed by clearing and grubbing during construction of the new training complex. All site preparation activities would follow Best Management Practices per Fort Bliss Construction Stormwater Pollution Prevention Plan guidance for erosion control and prevention of noxious vegetation. All buildings would be constructed to meet Leadership in Engineering and Environmental Design Silver rating.

All UAS operations, including Grey Eagle and Shadow, would remain within Fort Bliss restricted airspace, and flights to the McGregor Range would utilize the existing Certificate of Authorization (COA) for crossing U.S. Highway 54. One company of Grey Eagle Soldiers would be stationed at Fort Bliss, which would include up to 128 Soldiers and nine Grey Eagle aircraft, four fully assembled and five stored in boxes. Grey Eagle sorties would include day and night operations (with approval of the appropriate COAs), with both live and inert Hellfire missiles deployed for use at existing live fire ranges on Fort Bliss. Approximately four to seven Grey Eagle and Shadow sorties would be conducted daily for 5 days per week, with a surge to 7 days per week if needed.

Airfields in the vicinity that could be used as alternative landing sites in case of emergency would include Orogrande Airstrip, Condron Army Airfield, and Holloman Air Force Base west of U.S.

Highway 54, and Wilde-Benton and Davis Dome airstrips east of U.S. Highway 54. In the case of lost contact with a UAS by the home controlling authority, the UAS would automatically orbit in restricted airspace at designated safe locations either east or west of U.S. Highway 54 until communications control is reestablished or the aircraft runs out of fuel and descends to the ground.

No Action Alternative

Under this alternative, the installation would not construct a new UAS training complex. Since there are no existing airfields suitable for Grey Eagle and Shadow operations on the installation, deployment of the Grey Eagle to Fort Bliss could not occur and Shadow UAS operations would continue to be limited.

Alternative Locations Considered

No other Department of Defense airfields in the vicinity of Fort Bliss are suitable for deployment of UAS due to distance, lack of facilities, or lack of access to restricted airspace. Four other sites besides the TA 4D site were initially evaluated for the construction, operation, and maintenance of the UAS training complex, but were found to be not useable due to conflicts with other training activities and conflicts with civilian aircraft operations.

3.0 SUMMARY OF ENVIRONMENTAL RESOURCES AND IMPACTS

Implementation of the Proposed Action Alternative with the incorporated design, construction, operation, and safety measures would have no significant impacts on land use, biological resources, soils, water resources, noise, cultural resources, air quality, airspace, health and safety, hazardous materials and waste, infrastructure, and transportation on Fort Bliss or the surrounding area.

4.0 CONCLUSION

Based on the analyses of the Proposed Action Alternative and the design, construction, operation, and safety measures presented in the EA, I conclude that the impacts of the Proposed Action Alternative will not significantly affect the human or natural environment of Fort Bliss or the surrounding area. I further conclude that the Proposed Action Alternative will impose no direct or indirect effects that cannot be mitigated or that could contribute to cumulative effects requiring preparation of an Environmental Impact Statement, pursuant to the National Environmental Policy Act of 1969 (Public Law 91-190). Therefore a FNSI is warranted.

DRAFT

_____ _____

SIGNATURE AUTHORITY Date

EXECUTIVE SUMMARY

Purpose of and Need for the Proposed Action

Recent successes of unmanned aerial systems (UAS) support for ground troops survivability, the gathering of intelligence, and the elimination of opposing units before they can engage U.S. and allied Soldiers point to the need for a robust and trained UAS force. The purpose of the Proposed Action is to provide airfield facilities for operation of UAS, including the Grey Eagle and Shadow UAS, at Fort Bliss within existing restricted airspace. In 2012, Chief of Army Staff General Raymond Odierno directed the Training and Doctrine Command to plan a reorganization that would put a Grey Eagle company in every Army division. The need for the Proposed Action is to comply with the directive and provide training support for UAS, including the Grey Eagle and Shadow UAS, at Fort Bliss and comprehensive and realistic training and range facilities for Soldiers in basic UAS operations within current restricted airspace.

After extensive planning and review, Doña Ana Range Training Area (TA) 4D was selected as the most suitable location for the UAS training complex. This is due to its location near established training facilities and existing access roads, accessibility to nearby utilities, availability of flight operations entirely within restricted airspace, and relatively short commuting distance to and from East and West Bliss. These are all organic requirements of the Grey Eagle and Shadow UAS programs. Because of the requirements for UAS capabilities within the Division, a need exists to have UAS airfields with all facilities necessary for Grey Eagle and Shadow UAS operations and Soldier training at Fort Bliss complete in time for a planned 2016 stationing of a Grey Eagle UAS company. This company would complement the overall mission and capabilities of the 1st Armor Division at Fort Bliss.

Proposed Action Alternative

Fort Bliss proposes to construct, operate, and maintain a UAS training complex consisting of two takeoff and landing strips and support facilities for the Grey Eagle and Shadow UAS to be used for training of Soldiers for deployment. Other UAS may use the Grey Eagle airfield as needed. These other systems would need to be technically capable of landing and takeoff within the design parameters of the proposed UAS training complex. The Proposed Action would locate the UAS training complex in TA 4D of the Doña Ana Range on Fort Bliss, in Doña Ana and Otero counties, New Mexico. All UAS flight operations would take place within existing Fort Bliss restricted airspace.

The UAS training complex would include a 5,000-foot-long paved runway and access taxiway for the Grey Eagle UAS and a 1,000-foot-long paved runway for the Shadow UAS, as well as parking areas. A 50,000-square-foot Grey Eagle storage hangar with office and support buildings and a command and control center would be constructed, as well as a hot loading facility for munitions deployment, and a hazardous materials building. Security fencing and lighting would be installed around the perimeter of the Grey Eagle facility, and improvements to the existing Hueco Camp Road would be made, along with new water, fiber-optic, and electrical utilities installed from the Doña Ana Base Camp, McGregor Range Camp, and/or the U.S. Highway 54 corridor. All rights-of-way for utilities would be surveyed for archaeological and natural resources prior to construction. A 1,000-foot-long cleared and graded safety run-out zone would be constructed at each end of the Grey Eagle airfield.

The Shadow UAS airstrip would be located south of Hueco Camp Road. The Shadow UAS is a smaller UAS launched by catapult and capable of landing on a 1,000-foot-long paved runway with an arrestor cable or barrier. It is used for battlefield surveillance only and does not carry munitions. The location of the Shadow airstrip near the proposed Grey Eagle airfield location in TA 4D would facilitate efficiency of construction, personnel deployment, and UAS flight coordination. The distance separation of the two airfields is the minimum required (1,000 feet) for simultaneous operation of both UAS.

Approximately 119.5 acres would be disturbed by clearing and grubbing during construction of the new UAS training complex (117 acres for Grey Eagle and 2.5 acres for Shadow). If needed to level the project area, additional soil would be obtained from Range Management and Department of Public Works-Environmental approved borrow pits within Fort Bliss. No soil would be brought in from outside Fort Bliss boundaries. All site preparation activities would follow Best Management Practices per Fort Bliss Construction Stormwater Pollution Prevention Plan guidance for erosion control and noxious vegetation prevention. Stormwater management would also comply with the Energy Independence Security Act (EISA) Section 438. All buildings would be constructed to meet Leadership in Engineering and Environmental Design Silver rating.

Grey Eagle and Shadow UAS operations would remain within Fort Bliss restricted airspace, and flights to the McGregor Range would utilize the existing Certificate of Authorization (COA) for crossing U.S. Highway 54. One company of Grey Eagle Soldiers would be stationed at Fort Bliss, which would include up to 128 Soldiers and nine Grey Eagle aircraft, four fully assembled and five stored in boxes. Billeting for the UAS company personnel would occur at both the new UAS training complex and at existing 1st Armor Division barracks on East Fort Bliss. The Soldiers actively training at the Grey Eagle facility would rotate in and out. Grey Eagle and Shadow sorties would include day and night operations (with approval of the appropriate COAs), with both live and inert Hellfire missiles deployed for use at existing live fire ranges on Fort Bliss. Approximately four to seven Grey Eagle and Shadow sorties would be conducted daily for 5 days per week, with a surge to 7 days per week if needed.

Airfields in the vicinity that could be used as alternative emergency landing sites would include Orogrande Airstrip, Condron Army Airfield, and Holloman Air Force Base west of U.S. Highway 54, and Wilde-Benton or Davis Dome airstrips east of U.S. Highway 54. In the case of lost contact with a Grey Eagle or Shadow UAS by the home controlling authority, the UAS would automatically orbit in restricted airspace at designated safe locations either east or west of U.S. Highway 54 until communications control is reestablished or the aircraft runs out of fuel and descends to the ground.

No Action Alternative

Under this alternative, the installation would not construct a new UAS training complex for Grey Eagle or Shadow UAS operations. Since there are no existing airfields suitable for Grey Eagle operations on the installation, deployment of the Grey Eagle to Fort Bliss could not occur. Shadow UAS operations would continue to be hampered by lack of a dedicated airstrip. Consequently, Fort Bliss would not be in compliance with Army Headquarters directives, and Soldiers training at Fort Bliss would not receive the required Grey Eagle and Shadow operations

training and would not be deployable to operate UAS in theater situations. This could result in the units to which these Soldiers are assigned not being combat-ready and not meeting stated deployment criteria.

Environmental Consequences

The EA determined that the Proposed Action Alternative, with specified design, construction, operation, and safety measures, would have no significant adverse impacts on the environment. Potential impacts on resources that could be affected by the implementation of the alternatives described above are summarized in Table ES-1. Base Closure and Realignment Commission-mandated expansion and construction, including the training of Soldiers in operation of UAS such as the Grey Eagle and Shadow, have been programmatically assessed in the *Fort Bliss, Texas and New Mexico Mission and Master Plan Final Supplemental Programmatic Environmental Impact Statement*, for which a Record of Decision (ROD) was signed on 30 April 2007. Subsequent to that, Army transformation and growth directives were assessed in the *Fort Bliss Army Growth and Force Structure Realignment Final Environmental Impact Statement*, for which a ROD was signed on 08 June 2010.

The entire Grey Eagle UAS program was assessed in the *Final Life Cycle Environmental Assessment for the Extended Range/Multi-Purpose Unmanned Aerial Vehicle System,* for which a Finding of No Significant Impact was signed in December 2004, and in the *Unmanned Aerial Systems: Training and Testing at U.S. Army Installations Programmatic Environmental Assessment*. The stationing action for the UAS personnel at Fort Bliss was documented in a *Record of Environmental Consideration for the MQ-1C Grey Eagle UAS Stationing,* which was signed in May 2011. This EA incorporates these previous documents by reference. The Proposed Action Alternative would not differ materially from the analyses in these documents.

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Table ES-1. Summary Matrix of Potential Impacts

Resource	No Action Alternative	Proposed Action Alternative
Land Use	No changes in land use would occur.	Land use would change from training to facilities and from relatively semi-disturbed desert lands to developed airfield facilities. This loss of training lands or degradation of a natural area would be minimal in comparison to the amount of similar lands available within the region and on Fort Bliss.
Biological Resources	No impacts on biological resources would occur.	No Federally listed threatened or endangered species would be affected. The potential impact on biological resources as a result of the loss of vegetation and wildlife habitat would be considered long-term but minor because of the vast amounts of similar mesquite coppice dune habitat throughout Fort Bliss. Best management practices (BMPs) would be used during construction, including installation of avian protection features on power lines in accordance with APLIC guidelines.
Soils	No impacts on soils would occur.	No special or prime farmland soils are located at the proposed UAS training complex site. Approximately 119.5 acres of typical Chihuahuan Desert soils would be developed for the UAS training complex and this amount of soil would be disturbed as part of the Proposed Action. These impacts would not result in major impacts on the soil resources of the region based on the overall availability of the same type desert soils within and outside of Fort Bliss.
Water Resources	No impacts on surface water would occur. No direct impacts on groundwater would occur.	No Federally regulated waters of the U.S. would be impacted, as none are located near the site. Potable water would be piped in from existing sources, and minimal additional groundwater use would occur at the UAS training complex.
Noise	No change in the noise environment would occur.	The implementation of this alternative would result in minimal impacts on the noise environment within Fort Bliss since the proposed UAS training complex is not located within hearing distance of any existing Fort Bliss or civilian facilities. There are no nearby sensitive noise receptors and noise impacts from construction and maintenance activities, as well as UAS operations, would be considered minimal.
Cultural Resources	No impacts on cultural resources would occur.	Surveys determined that no surface archaeological sites eligible for inclusion in the National Register of Historic Places (NRHP) would be affected at the UAS training complex site. Utility ROWs would be surveyed and mitigated, if necessary, prior to construction. Therefore, no impacts on historic properties would occur.
Air Quality, Greenhouse Gases (GHG), and Climate Change	No direct impacts on air quality or GHG and climate change would occur.	Temporary and minor increases in air pollution would occur from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction of the UAS training complex. The air emissions from the proposed operational activities do not exceed Federal *de minimis* thresholds. The impacts on air quality, GHG and climate change from the implementation of this alternative would be minor.
Airspace	No impacts on airspace operations would occur.	There would be no change in the airspace designation. The impacts on airspace operations would be negligible, since all aircraft operations would occur within existing Fort Bliss restricted airspace and in accordance with COAs.
Health and Safety	No impacts on health and safety would occur.	The proposed UAS training complex site was surveyed for unexploded ordnance (UXO), and none was found. The site is located over 4 miles from the nearest civilian population area, which is beyond the possible missile loading accident safety zone. No UAS flights over civilian populations would occur. Therefore, negligible to minor impacts on health and safety would be expected as a result of this alternative.
Socioeconomics	Detrimental socioeconomic impacts would not occur since the project would not be built.	Implementation of the Proposed Action Alternative would have a beneficial impact on the local economy due to minor increases in revenues for local business as a result of construction activities. The increase in construction workforce and revenue would be temporary. However, there would be a minor continuing beneficial impact due to a minor permanent increase in Fort Bliss personnel (128) for UAS training operations.
Environmental Justice and Protection of Children	No impacts on environmental justice or protection of children would occur.	No disproportionate health or environmental effects on minorities or low-income populations or communities would occur as a result of the Proposed Action Alternative, as none are located near the proposed UAS training complex.
Hazardous Materials and Waste	There would be no increase in the use and generation of hazardous materials and wastes on Fort Bliss.	A limited amount of potentially hazardous materials and waste and fuel would be used or generated at the proposed UAS training complex from construction, maintenance, and operational activities, including petroleum, oil, and lubricants (POL). Any hazardous wastes generated as part of this project would be disposed of or recycled according to the Installation Hazardous Waste Management Plan; therefore, impacts from hazardous materials and waste would be minor. No fuel storage is planned for the UAS training complex.
Energy Demand and Utilities	No construction, maintenance, or operation of a new training complex would occur; therefore, there would be no impacts.	Fort Bliss would extend utilities from existing coverage area, and no excess demand would be placed on energy capacity for Fort Bliss or the general area. An installed geothermal heat pump system would reduce energy demand at the proposed UAS training complex.
Radio Frequency and Spectrum Use	No changes to radio frequency or spectrum use would occur.	The proposed equipment to be used for the UAS control stations would meet or exceed requirements established by the Federal Communication Commission and MIL-STD-461F. Negligible impacts on radio frequency or spectrum use could occur due to equipment malfunction.
Traffic and Transportation	No changes for traffic and transportation resources would occur.	Traffic would increase slightly on roads around TA 4D during construction of the UAS training complex. Maintenance and ongoing operations of the UAS training complex would have negligible impacts on traffic or transportation within Fort Bliss or the region because the primary access road is already used for training activities. Approximately 1,700 feet of Hueco Camp Road would be paved, improving vehicular access.

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SECTION 1.0
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

Fort Bliss Army Reservation is an active training facility located in west Texas and the south-central area of New Mexico. The installation is approximately 1.2 million acres in size and consists of West Bliss, East Bliss (including Biggs Army Airfield [BAAF]), and the Fort Bliss Training Center (FBTC). The FBTC is separated into three geographic areas: South Training Area in El Paso County, Texas; Doña Ana Range-North Training Area in Doña Ana and Otero counties, New Mexico; and McGregor Range in Otero County, New Mexico. The FBTC is further divided into numbered training areas (TA) to manage and schedule the different training missions (Figure 1-1).

Fort Bliss is home to the 1st Armor Division. This includes two Heavy Brigade Combat Teams (HBCT), Infantry Brigade Combat Teams (IBCT), a Stryker Brigade, a Fires (Artillery) Brigade, a Sustainment Brigade, and a Combat Aviation Brigade (CAB), all under Forces Command (FORSCOM). Fort Bliss has also become a training platform for multiple units deploying to theaters of operation and is a focal point for the U.S. Army (Army) as a major installation for training Soldiers for combat readiness.

Fort Bliss proposes to construct, operate, and maintain a new unmanned aerial systems (UAS) training complex in the Doña Ana Range TA 4D (see Figure 1-1) to be used for deployment and operation of the Army Grey Eagle (MQ-1C) and Shadow (RQ-7B) UAS (Photographs 1-1 and 1-2). Base Closure and Realignment Commission (BRAC)-mandated expansion and construction, including the training of Soldiers in operation of UASs such as the Grey Eagle and Shadow, have been programmatically assessed in the *Fort Bliss, Texas and New Mexico Mission and Master Plan Final Supplemental Programmatic Environmental Impact Statement* (SEIS), for which a Record of Decision (ROD) was signed on 30 April 2007 (Army 2007a). Subsequent to that, Army transformation and growth directives were assessed in the *Fort Bliss Army Growth and Force Structure Realignment Final Environmental Impact Statement* (GFS EIS), for which a ROD was signed on 08 June 2010 (Army 2010a).

The entire Grey Eagle UAS program was assessed in the *Final Life Cycle Environmental Assessment (LCEA) for the Extended Range/Multi-Purpose (ER/MP) Unmanned Aerial Vehicle System,* for which a Finding of No Significant Impact (FNSI) was signed in December 2004 (Army 2004), and in the *Unmanned Aerial Systems: Training and Testing at U.S. Army Installations Programmatic Environmental Assessment (PEA)* (Army 2010b). The stationing action for the UAS personnel at Fort Bliss was documented in a *Record of Environmental Consideration (REC) for the MQ-1C Grey Eagle UAS Stationing,* which was signed in May 2011 (Army 2011a). This environmental assessment (EA) will incorporate the aforementioned EISs, PEA, and EAs by reference.

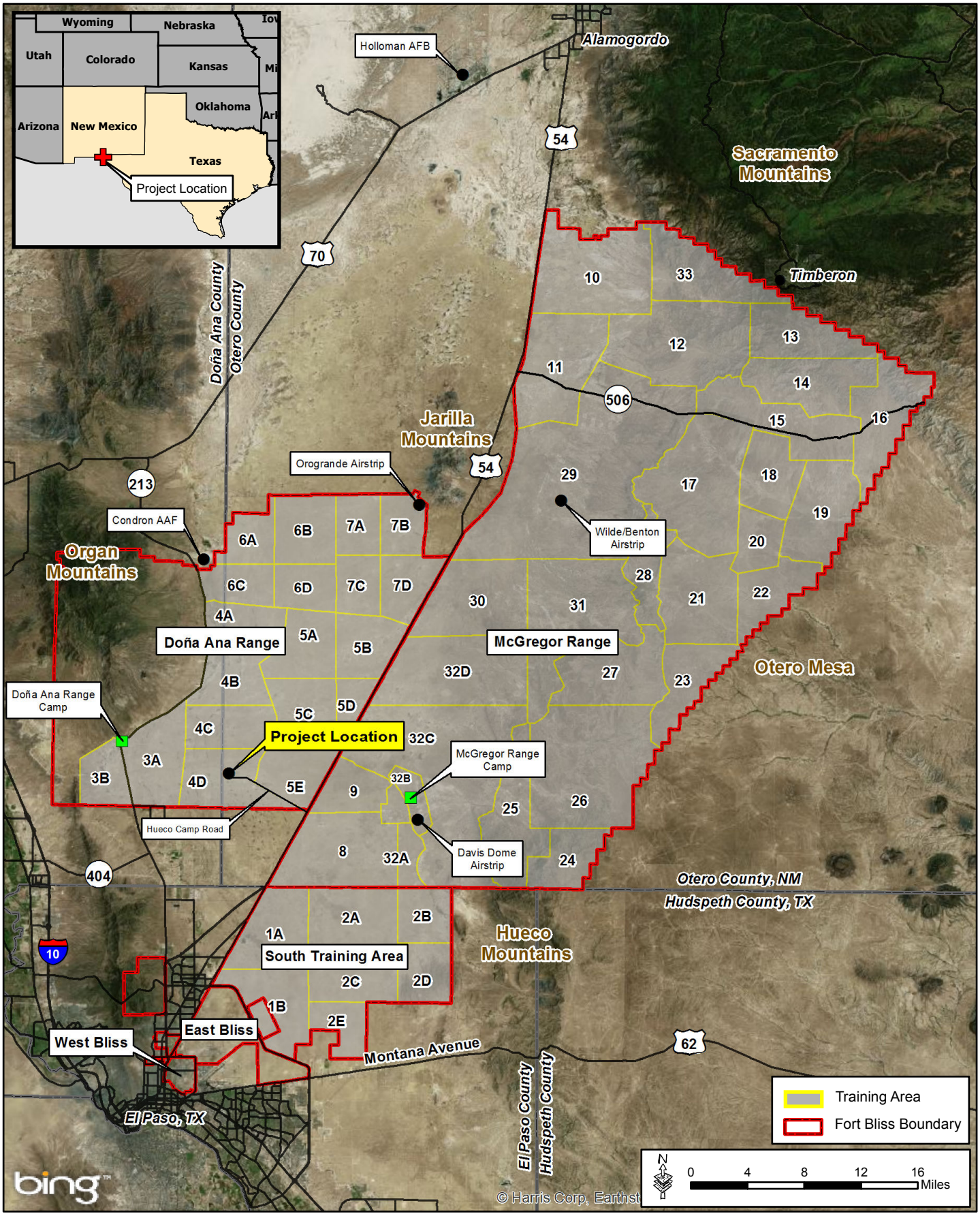

Figure 1-1: Fort Bliss Vicinity Map

GSRC

November 2012

Photograph 1-1. MQ-1C Grey Eagle

Photograph 1-2. RQ-7B Shadow

The Grey Eagle UAS is medium-sized aircraft powered by a heavy fuel (diesel), turbocharged piston engine (see Photograph 1-1). It has a wingspan of 56.3 feet and a length of 29 feet, with a maximum speed of 170 miles per hour and a flight endurance of 36 hours. Maximum takeoff weight is 3,600 pounds with full fuel and a payload of reconnaissance equipment and/or four Hellfire missiles, and it can operate up to an altitude of 29,000 feet.

The Shadow UAS (see Photograph 1-2) is a smaller aircraft used for tactical field surveillance. It has a wingspan of 14 feet and a length of 11 feet, and is powered by a small gasoline engine. It has an endurance of over 6 hours, weighs approximately 400 pounds, and operates up to an altitude of over 14,000 feet. It is launched with a catapult and recovered with arresting cables or a runway barrier.

Fort Bliss presently has only one airfield (BAAF) that would meet the operational requirements for the Grey Eagle. As BAAF is not located within military restricted airspace, a Federal Aviation Administration (FAA) Certificate of Authorization (COA) would be required to operate UAS flights from BAAF to restricted airspace (Figure 1-2). A COA is a permit issued by the FAA for operation of aircraft in controlled airspace at a specified location with controls in place to prevent conflicts with other aircraft and to preserve the safety of persons and facilities on the ground. The FAA has indicated that UAS flights operating out of BAAF would conflict with air traffic from nearby El Paso International Airport; thus, a COA would not be granted (Steagall 2012, personal communication). Therefore, Fort Bliss is proposing construction of a new UAS training complex to be located in an area not previously analyzed for such use in the previous *SEIS*, *GFS EIS* and *EA* documents (see Figure 1-1). Consequently, a change in land use to accommodate new UAS training complex construction and UAS operations would occur. This Proposed Action would create potential impacts on the natural and human environment and require an EA per 32 Code of Federal Regulations (CFR) Part 651 *Environmental Analysis of Army Actions*.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Recent successes of UAS support for ground troops survivability, the gathering of intelligence, and the elimination of opposing units before they can engage U.S. and allied Soldiers point to the need for a robust and trained UAS force. The purpose of the Proposed Action is to provide airfield facilities for operation of the Grey Eagle and Shadow UAS at Fort Bliss within existing restricted airspace. In 2012, Chief of Army Staff General Raymond Odierno directed the Training and Doctrine Command (TRADOC) to plan a reorganization that would put a Grey Eagle company in every Army division (Odierno 2012). The need for the Proposed Action is to comply with the directive and provide training support for the Grey Eagle and Shadow UAS at Fort Bliss and comprehensive and realistic training and range facilities for Soldiers in basic UAS operations within current restricted airspace.

After extensive planning and review, Doña Ana Range TA 4D was selected as being the most suitable location for the UAS training complex for Grey Eagle and Shadow UAS operations. This is due to its location near established training facilities and existing access roads, accessibility to nearby utilities, availability of flight operations entirely within restricted airspace, and relatively short commuting distance to and from East and West Bliss. These are all organic requirements of the Grey Eagle and Shadow UAS programs. Because of the requirements for UAS capabilities within the Division, a need exists to have UAS airfields with all facilities necessary for Grey Eagle and Shadow UAS operations and Soldier training at Fort Bliss complete in time for a planned 2016 stationing of a Grey Eagle UAS company. This company would complement the overall mission and capabilities of the 1st Armor Division at Fort Bliss.

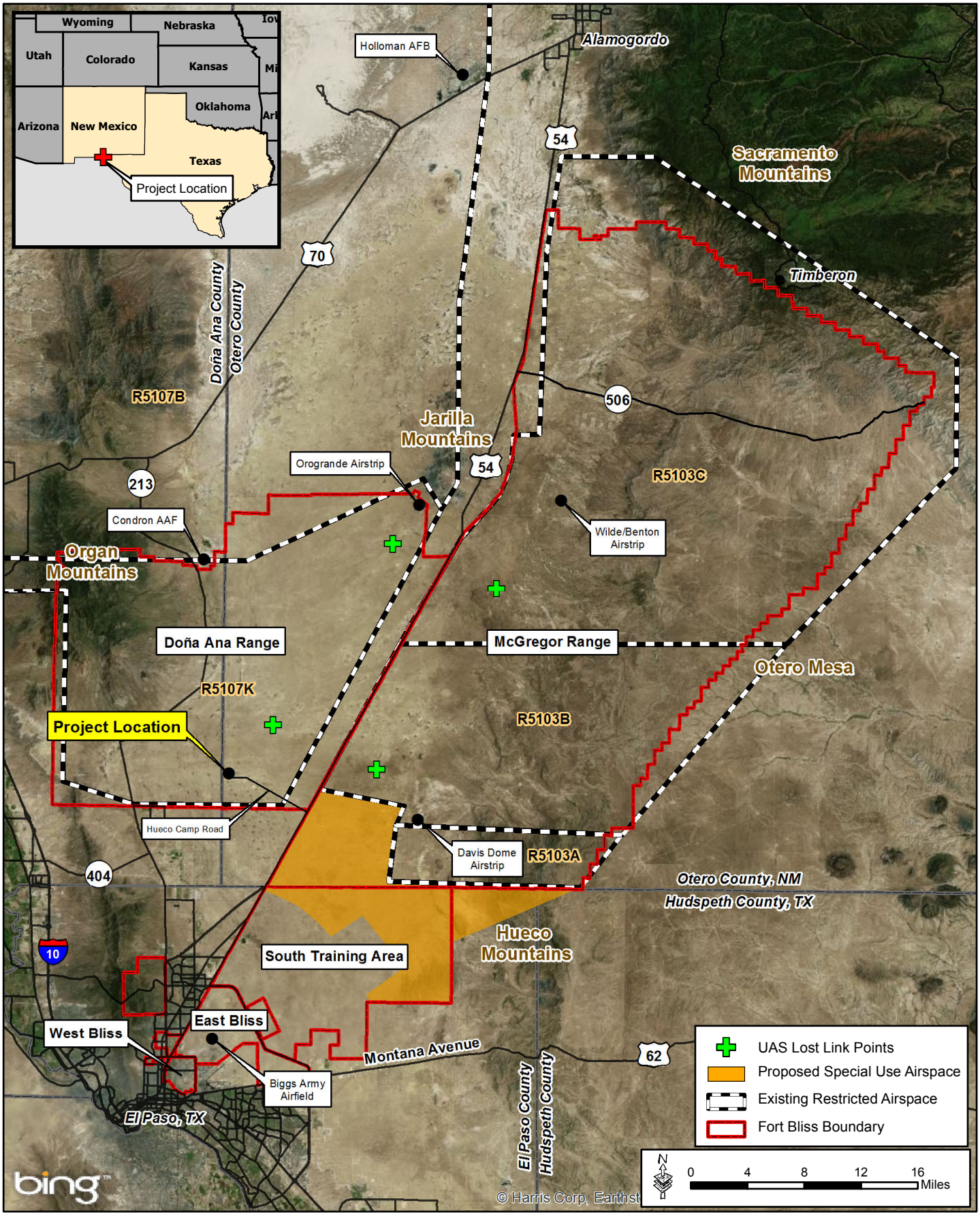

Figure 1-2: Fort Bliss and Vicinity Airspace Map

GSRC

November 2012

1.3 SCOPE

This EA has been prepared by Gulf South Research Corporation (GSRC) on behalf of the U.S. Army Corps of Engineers (USACE), Tulsa District, for Fort Bliss to comply with the National Environmental Policy Act (NEPA) of 1969 (Public Law [PL] 91-190; 42 U.S. Code [USC] 4321-4347), as amended. Preparation of this EA followed instructions established in 32 CFR 651, *Environmental Analysis of Army Actions*, and 40 CFR 1500-1508, Council on Environmental Quality (CEQ) regulations, as well as Army Regulation 200-1, *Environmental Protection and Enhancement* (Army 2007b). NEPA is a Federal environmental law establishing procedural requirements for all Federal agency actions, and directs the Army to disclose the environmental effects of its proposed activities at Fort Bliss to the public and officials who must make decisions regarding the proposal.

This EA will identify, document, and evaluate the potential environmental effects of the construction, operation, and maintenance of a new UAS training complex for the Grey Eagle and Shadow at a preferred location in Doña Ana Range TA 4D.

1.4 DECISION(S) TO BE MADE

The proponent for the action is FORSCOM G-3-Training; Fort Bliss, Texas. The Army, FORSCOM G-3, Fort Bliss, and USACE, Tulsa District, are the lead agencies responsible for the completion of the EA. If no significant environmental impacts are determined based on the evaluation of impacts in the EA, a FNSI will be signed by the Garrison Commander. If it is determined that the Proposed Action will have significant environmental impacts, either the action will not be undertaken, or a Notice of Intent to prepare an EIS will be published in the *Federal Register*.

1.5 PUBLIC PARTICIPATION

The Army invites public participation in the NEPA process to promote open communication and enable better decision making. Input and comments will be solicited from the public in accordance with the NEPA. The EA and draft FNSI will be made available to the public with a Notice of Availability published in the *El Paso Times*, *Las Cruces Sun*, and *Alamogordo Daily News*, and the drafts will be distributed to local libraries, agencies, organizations, and individuals who expressed interest in the project. The EA and draft FNSI (if applicable) will be made available to the public for a 30-day comment period. The EA will also be posted to the Fort Bliss website at www.bliss.army.mil. During this time, the Army will consider any comments submitted by agencies, organizations, or members of the public on the Proposed Action, the EA, or the draft FNSI. At the conclusion of the comment period, the Army may, if appropriate, execute the FNSI and proceed with the Proposed Action. A distribution list for the EA can be found in Appendix A.

SECTION 2.0
PROPOSED ACTION AND ALTERNATIVES

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 CRITERIA FOR EVALUATING ALTERNATIVE SITES

The following criteria were utilized for selecting potential airfield facilities locations and evaluating their suitability for the Proposed Action. A suitable location would:

- meet mission and safety requirements
- avoid impacts on airspace safety zones
- avoid impacts on sensitive resources or allow environmentally sound mitigation to be accomplished within fiscal feasibility
- avoid the need for design measures exceeding fiscal feasibility
- be located in a remote area, yet within easy travel distance from East and West Bliss
- be located within existing Fort Bliss restricted airspace
- be situated such that UAS operations would not impact civilian populations in the region

2.2 NO ACTION ALTERNATIVE

Under this alternative, the installation would not construct a UAS new training complex for Grey Eagle and Shadow UAS operations. Since there are no existing airfields suitable for Grey Eagle operations on the installation, deployment of the Grey Eagle to Fort Bliss could not occur and Shadow UAS operations would continue to be limited. Consequently, Fort Bliss would not be in compliance with Army Headquarters directives, and Soldiers training at Fort Bliss would not receive the required Grey Eagle operations training and would not be deployable to operate the Grey Eagle in theater operations. This could result in the units to which these Soldiers are assigned not being combat-ready and not meeting stated deployment criteria.

2.3 PROPOSED ACTION ALTERNATIVE

Fort Bliss proposes to construct, operate, and maintain a UAS training complex for the Grey Eagle and Shadow UAS to be used for training of Soldiers for deployment. Other UAS could also utilize the airfield, as needed. These other systems would need to be technically capable of landing and takeoff within the design parameters of the proposed complex. The Proposed Action would locate the UAS training complex in TA 4D of the Doña Ana Range on Fort Bliss, in Doña Ana and Otero counties, New Mexico (see Figure 1-1). All Grey Eagle and Shadow UAS flight operations would take place within existing Fort Bliss restricted airspace. Other locations on and off of Fort Bliss were considered, but did not sufficiently meet the project requirements (see Section 2-4).

The new Grey Eagle airfield facilities would include a 5,000-foot-long, 100-foot-wide, concrete-paved runway and access taxiway, as well as parking areas. A 50,000-square-foot storage hangar with office and support buildings and a command and control center would be constructed, as well as a hot loading facility for munitions deployment, a hazardous materials building, security fencing, security lighting, improvements to Hueco Camp Road, new water, fiber-optic, and electrical utilities, and a septic system and leach field (Figure 2-1). All UAS facilities would be constructed in accordance with Department of the Army Technical Letter

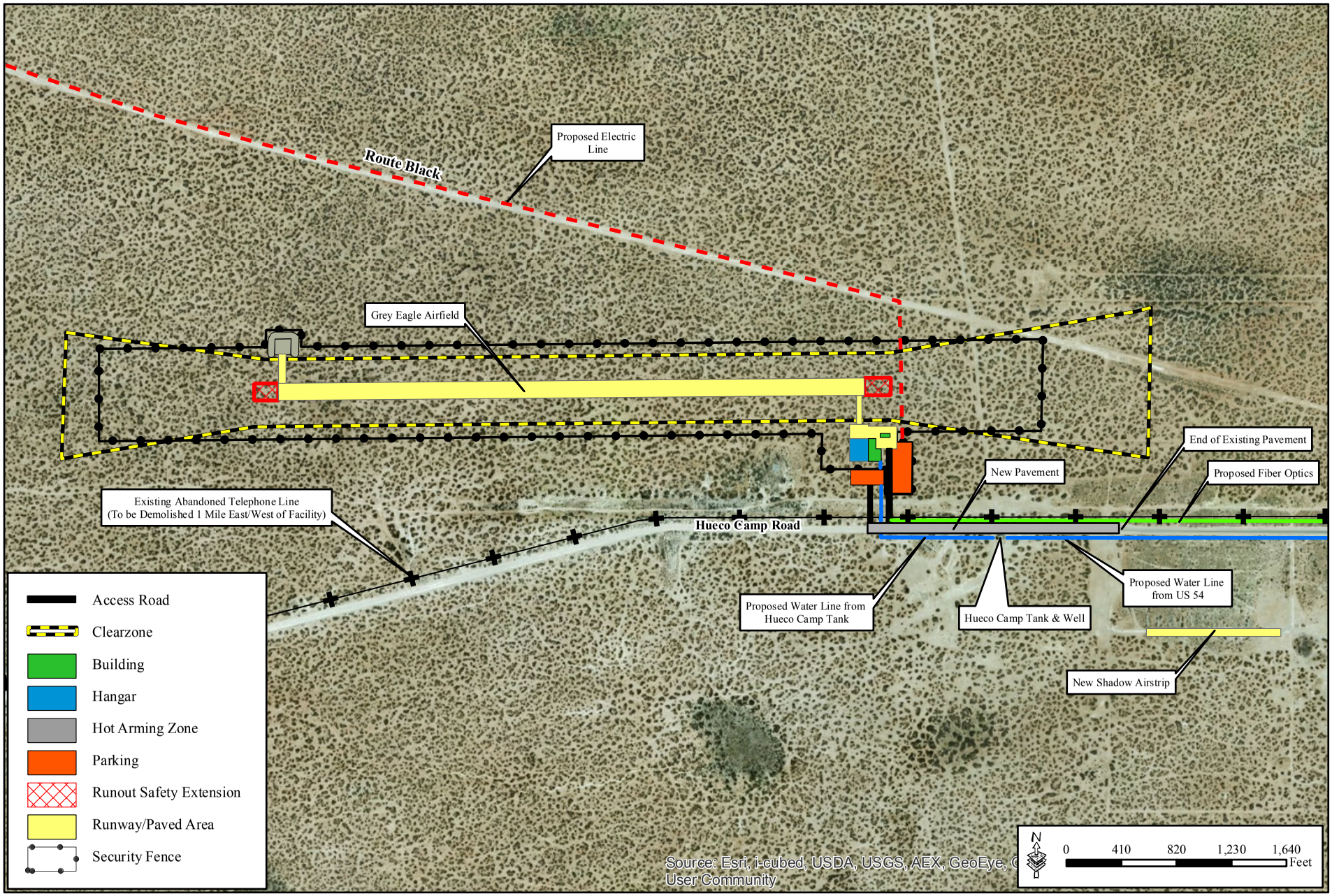

Figure 2-1: UAS Training Complex Facilities Location Map

GSRC

April 2013

1110-3-506, *Aviation Complex Planning and Design Criteria for Army Unmanned Aircraft Systems* (Army 2011b). All buildings would be constructed to meet Leadership in Engineering and Environmental Design (LEED) Silver rating.

The Grey Eagle facility would handle nine aircraft, four fully assembled and five in storage boxes. Billeting for the UAS company personnel would occur at both the new UAS training complex and at existing 1st Armor Division barracks on East Fort Bliss. The maximum expected headcount for the UAS training complex would be 128 personnel at any one time. If the UAS training complex is expanded in the future, additional NEPA compliance would be necessary.

Electricity would be supplied through the installation of approximately 7 miles of new distribution line from the Doña Ana Base Camp substation. The line would be underground, overhead, or some combination of both and follow existing road right-of-way (ROW) on Route Black (see Figure 2-1). All overhead electrical lines would meet avian protection guidelines. To provide communications to the UAS training complex, approximately 11 miles of underground fiber-optic line would be installed from McGregor Range Camp along the edge of the existing road ROW for Hueco Camp Road. Potable water would be supplied either through a new water main connecting to an existing water main located along U.S. Highway 54 or from an updated Hueco Camp elevated water tank and well located on the south side of Hueco Camp Road (see Figure 2-1). All ROW for utilities would be surveyed for archaeological and natural resources and appropriate mitigation measures undertaken, if necessary, prior to construction.

The hangar facility would have an oil/water separator for wash water. Heating and cooling of the administration portion of the facility would be accomplished with propane heaters or through a closed-loop, ground-source heat pump. Approximately fifty 350-foot-deep boreholes within the fenced area would be utilized for the closed-loop geothermal system. All wash and waste water would be treated in a septic system consisting of two septic tanks (3,000 gallons total) and a 750-square-foot leach field.

Approximately 1,700 feet of Hueco Camp Road would be resurfaced with concrete from the end of existing pavement to the entrance road to the Grey Eagle facility. A temporary concrete batch plant would be installed at the construction site to supply the necessary concrete for the project. For aircraft landing clearance, an existing, but abandoned, telephone line located on the north side of Hueco Camp Road would be demolished for 1 mile in either direction of the new UAS training complex, and a 1,000-foot-long cleared and graded aircraft safety run-out zone would be constructed at each end of the Grey Eagle runway (see Figure 2-1). A clear zone, with vegetation height limited for takeoff and landing clearance, would be maintained as shown in Figure 2-1. No ground disturbance would occur outside the fenced area.

The Shadow UAS airstrip would be located south of Hueco Camp Road within a highly disturbed area historically used for Troop bivouacking (see Figure 2-1). The Shadow facility would include a 1,000-foot-long, 50-foot-wide paved runway with a runoff area, net barrier or arresting cables for aircraft recovery, and an unsurfaced access road and parking area. Aircraft storage facilities, utilities, fencing, and lighting would not be included for the Shadow UAS airstrip. The Shadow UAS is launched by catapult and recovered with an arresting cable or

barrier. The separation distance of the Shadow and Grey Eagle runways is the minimum required by the Army (i.e., 1,000 feet) for simultaneous operation of both UAS (Army 2011b).

Approximately 119.5 acres (117 acres for Grey Eagle and 2.5 acres for Shadow) would be disturbed by clearing and grubbing during the construction of the airfields, buildings, and utilities. If necessary to level the construction areas, additional soil would be obtained from Range Management and Directorate of Public Works-Environmental division (DPW-E) approved borrow pits within Fort Bliss. No soil would be brought in from outside Fort Bliss boundaries. All site preparation activities would follow Best Management Practices (BMPs) per Fort Bliss Construction Stormwater Pollution Prevention Plan (SWPPP) guidance to prevent erosion and to control noxious weeds (Fort Bliss DPW 2013). Construction stormwater management would comply with Section 438 of the Energy Independence Security Act (EISA).

All UAS operations would remain within Fort Bliss restricted airspace, and flights to the McGregor Range would utilize the existing COA for crossing U.S. Highway 54. UAS sorties would include day and night operations (with approval of the appropriate COAs), with both live and inert Hellfire missiles deployed for use at existing live fire ranges on Fort Bliss. Approximately four to seven Grey Eagle and Shadow sorties would be conducted daily for 5 days per week, with a surge to 7 days per week if needed. Occasional helicopter landings on the Grey Eagle runway would be possible, if necessary, but the runway would not be rated for heavy, multi-engine aircraft landings.

Airfields in the vicinity that could be used as alternative emergency landing sites would include Orogrande Airstrip, Condron Army Airfield (AAF), and Holloman Air Force Base (AFB) west of U.S. Highway 54, and Wilde-Benton and Davis Dome airstrips east of U.S. Highway 54 (see Figure 1-1). In the case of lost contact with a Grey Eagle or Shadow UAS by the home controlling authority, the UAS would automatically orbit in restricted airspace at designated safe locations either east or west of U.S. Highway 54 until communications control is reestablished or the aircraft runs out of fuel and descends to the ground (see Figure 1-2). The lost-link safe locations are specified in the existing UAS COA for Fort Bliss (FAA 2012), located in Appendix C.

2.4 ALTERNATIVES EXCLUDED FROM FURTHER CONSIDERATION

The following alternatives have been considered, but have been excluded from further analysis in this EA.

2.4.1 Use of Alternative Sites on Fort Bliss

Four other sites besides the TA 4D site were initially evaluated for the construction, operation, and maintenance of the Grey Eagle facility. These four sites included Orogrande, Wilde-Benton, and Davis Dome airstrips, as well as BAAF, on Fort Bliss.

- BAAF was originally proposed as the preferred alternative for the Grey Eagle deployment at Fort Bliss; however, after consultation with the FAA, it was concluded that the proximity to the civilian population of El Paso, as well as the potential for conflicts with civilian and commercial aviation operations at El Paso International

Airport, would result in unavoidable safety concerns. Also, BAAF does not have current UAS access to Fort Bliss restricted airspace without having to transit airspace used by other civilian and commercial aircraft, and the FAA indicated that a COA for that transit would not be forthcoming (Steagall 2012, personal communication).

- Orogrande Airstrip was considered, but Elephant Mountain, located to the west of the airstrip, poses a large obstruction to flight operations. The airstrip is also located on the northern boundary of Doña Ana Range and Fort Bliss restricted airspace, limiting UAS operations to the north. Additionally the airstrip was deemed too far from East and West Bliss for efficient transport of troops and equipment.
- Wilde-Benton Airstrip was considered, but further analyses indicate that it is too far for efficient transport of troops and equipment and has no ready access to utilities.
- Davis Dome Airstrip was considered, but there is not enough room adjacent to the airstrip to locate the hangar, hot loading area, and control facilities, and the adjacent airspace to the southwest is not restricted and would require a COA for takeoffs in that direction.

The Shadow airstrip was also considered for siting at the four alternative locations listed above. Due to the efficiency of locating both UAS airfields in the same area, and the suitability for utilizing the Hueco Camp bivouac area for construction with minimal resource impacts, the proposed Shadow airstrip was located south of Hueco Camp Road, at least 1,000 feet from the Grey Eagle airstrip, as required for separation of operational airspace (Army 2011b). Soldiers deployed to the Shadow airstrip could also utilize the Grey Eagle facilities, if needed.

No other alternative sites for construction of new UAS training complex were found within the FBTC due to conflicts with other training activities.

2.4.2 Use of Other Department of Defense Assets

The nearest Department of Defense (DoD) airfield to Fort Bliss suitable for deployment of the Grey Eagle UAS is Holloman AFB, located near Alamogordo, New Mexico. Although Holloman AFB has been authorized for deployment by the U.S. Air Force (USAF) of the Predator UAS, similar to the Grey Eagle UAS, Holloman AFB is located 75 miles from East and West Bliss, a distance too great for practical commuting of Soldiers for training. Holloman AFB also has limited useable airspace/time available for Army operations due to existing USAF training requirements (USAF 2009).

Condron AAF is located on White Sands Missile Range to the north of Doña Ana Range, approximately 55 miles from East and West Bliss. It was eliminated because it is not controlled by Fort Bliss and is not within Fort Bliss restricted airspace. While Condron AAF has sufficient runway length for Grey Eagle operations, it is located too far from East and West Bliss for practical commuting of Soldiers and would require extensive facilities construction to house the Grey Eagle aircraft and operations personnel.

2.4.3 Upgrade Alternative for Air Force Reaper UAS

An alternative was considered to configure the UAS training complex and runway to accommodate the USAF Reaper UAS. The MQ-9 Reaper UAS is a turboprop-powered aircraft, similar to the Grey Eagle, but with a wingspan of 64 feet and a length of 36 feet. It is a heavier aircraft than the Grey Eagle, capable of carrying a larger payload of munitions and electronic

surveillance equipment. Holloman AFB indicated interest in this possibility and will discuss the subject further with Fort Bliss. The primary modification would be an extension of the 5,000-ft runway up to 3,000 additional feet (Steagall 2013, personal communication) and possible structural reinforcement of the entire runway for the heavier Reaper UAS. Additional support infrastructure, including buildings, would also be needed. However, this alternative has not been adequately developed and no decision has been made to carry it forward. Modifications for the Reaper UAS would also delay the Army's existing plans for the UAS training complex. If a decision is to be made, further NEPA analysis and additional resources surveys and UXO hazard evaluation would be required after development of the proposed action.

SECTION 3.0
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section of the EA describes the natural and human environment that exists within the project area and the potential impacts of the Proposed Action Alternative as outlined in Section 2.0 of this document. Only those resources that have the potential to be affected by any of the alternatives considered are described, as per CEQ guidance (40 CFR 1501.7[3]). Locations and resources with no potential to be affected need not be analyzed. The effects from the Proposed Action Alternative include impacts from construction, operation, and maintenance of a UAS training complex in Doña Ana Range TA 4D on Fort Bliss. This includes all areas and lands that might be affected or may change, depending on how the natural, cultural, and socioeconomic resources they contain or support are affected.

Impacts (consequence or effect) can be either beneficial or adverse, and can be either directly related to the action or indirectly caused by the action. Direct impacts are those effects that are caused by the action and occur at the same time and place (40 CFR 1508.8[a]). Indirect impacts are those effects that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8[b]). As discussed in this section, the No Action and Proposed Action Alternatives may create temporary (lasting the duration of construction), short-term (up to 3 years), long-term (greater than 3 years), or permanent impacts or effects.

Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts will be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected or the effects would be at or below the level of detection, and changes would not result in any measurable or perceptible consequences.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious, long-term, and would have substantial consequences on a regional scale. Extensive mitigation measures to offset the adverse effects would be required and success of the mitigation measures would not be guaranteed.

In accordance with the NEPA and the CEQ regulations implementing the NEPA, the analysis of environmental conditions only addresses those areas and environmental resources with the potential to be affected by either of the alternatives, the No Action Alternative and Proposed Action Alternative. More specifically, the EA examines the potential for direct, indirect, adverse, or beneficial impacts. The EA also assesses whether such impacts are likely to be long-term, short-term, permanent, or cumulative.

A Table of Valued Environmental Components (VEC) (Table 3-1) was used to determine which resources would potentially be affected by the Proposed Action. These resources are discussed in detail in the EA and include land use, biological resources, soils, water resources, noise, cultural resources, air quality, airspace, health and safety, socioeconomics and environmental justice, hazardous materials, energy demand and utilities, radio frequency and spectrum use, and traffic and transportation. A more detailed discussion and the impacts on the resources described above were programmatically evaluated in the *SEIS* (Army 2007a) and *GFS EIS* (Army 2010a).

3.1 LAND USE

3.1.1 Affected Environment

The Doña Ana Range is located in New Mexico on land completely managed by the Army that has been withdrawn from public domain through Public Land Order 833. The proposed UAS training complex described in the Proposed Action Alternative is located in an area of previously disturbed land, that is adjacent to existing facilities and encampments, classified by Fort Bliss as Land Use Category A (Army 2001). Category A allows off-road and on-road vehicle maneuvering for all types of vehicles and equipment, including both tracked and wheeled vehicles; dismounted (foot traffic) maneuvering and training; aircraft operations; mission support facilities; and other activities and uses. The Shadow airstrip site is located on heavily disturbed land used for heavy vehicle traffic and parking and for Troop bivouac.

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

No land use changes would occur as a result of the construction, maintenance, or operation of the UAS training complex, because no construction would occur

3.1.2.2 Proposed Action Alternative

Land use would be impacted by the construction, use, and maintenance of the UAS training complex in the Proposed Action Alternative. The implementation of the Proposed Action Alternative would change land use from moderately disturbed desert training lands to a developed military site with facilities to accommodate UAS operations and maintenance. However, the loss or degradation of these lands is minimal in comparison to the amount of similar lands available within the region and on Fort Bliss. For example, the estimated total known impacts would be 119.5 acres, while the total acreage of similar lands within Fort Bliss is over 500,000 acres. Therefore, the Proposed Action Alternative is consistent with land use plans on Fort Bliss and would not affect those resources that are required for, support, or benefit current land use. Thus, the Proposed Action Alternative would have minor impacts on land use.

3.2 BIOLOGICAL RESOURCES

3.2.1 Affected Environment

The vegetation community at the Proposed Action Alternative site is mapped as mesquite coppice dune and sandscrub (Army 2001), a vegetation community that comprises 438,850 acres, or 39.4 percent of total area on Fort Bliss. The site is almost entirely within the mesquite coppice dune community (predominantly sand dunes anchored by mesquite plants). A thorough description of biological resources and information on habitat and biological occurrences can be

Table 3-1. Summary Matrix of Potential Impacts

Resource	No Action Alternative	Proposed Action Alternative
Land Use	No changes in land use would occur.	Land use would change from training to facilities and from relatively semi-disturbed desert lands to developed airfield facilities. This loss of training lands or degradation of a natural area would be minimal in comparison to the amount of similar lands available within the region and on Fort Bliss.
Biological Resources	No impacts on biological resources would occur.	No Federally listed threatened or endangered species would be affected. The potential impact on biological resources as a result of the loss of vegetation and wildlife habitat would be considered long-term but minor because of the vast amounts of similar mesquite coppice dune habitat throughout Fort Bliss. Best management practices (BMPs) would be used during construction, including installation of avian protection features on power lines in accordance with APLIC guidelines.
Soils	No impacts on soils would occur.	No special or prime farmland soils are located at the proposed UAS training complex site. Approximately 119.5 acres of typical Chihuahuan Desert soils would be developed for the UAS training complex and this amount of soil would be disturbed as part of the Proposed Action. These impacts would not result in major impacts on the soil resources of the region based on the overall availability of the same type desert soils within and outside of Fort Bliss.
Water Resources	No impacts on surface water would occur. No direct impacts on groundwater would occur.	No Federally regulated waters of the U.S. would be impacted, as none are located near the site. Potable water would be piped in from existing sources, and minimal additional groundwater use would occur at the UAS training complex.
Noise	No change in the noise environment would occur.	The implementation of this alternative would result in minimal impacts on the noise environment within Fort Bliss since the proposed UAS training complex is not located within hearing distance of any existing Fort Bliss or civilian facilities. There are no nearby sensitive noise receptors and noise impacts from construction and maintenance activities, as well as UAS operations, would be considered minimal.
Cultural Resources	No impacts on cultural resources would occur.	Surveys determined that no surface archaeological sites eligible for inclusion in the National Register of Historic Places (NRHP) would be affected at the UAS training complex site. Utility ROWs would be surveyed and mitigated, if necessary, prior to construction. Therefore, no impacts on historic properties would occur.
Air Quality, Greenhouse Gases (GHG), and Climate Change	No direct impacts on air quality or GHG and climate change would occur.	Temporary and minor increases in air pollution would occur from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction of the UAS training complex. The air emissions from the proposed operational activities do not exceed Federal *de minimis* thresholds. The impacts on air quality, GHG, and climate change from the implementation of this alternative would be minor.
Airspace	No impacts on airspace operations would occur.	There would be no change in the airspace designation. The impacts on airspace operations would be negligible, since all aircraft operations would occur within existing Fort Bliss restricted airspace and in accordance with COAs.
Health and Safety	No impacts on health and safety would occur.	The proposed UAS training complex site was surveyed for unexploded ordnance (UXO), and none was found. The site is located over 4 miles from the nearest civilian population area, which is beyond the possible missile loading accident safety zone. No UAS flights over civilian populations would occur. Therefore, negligible to minor impacts on health and safety would be expected as a result of this alternative.
Socioeconomics	Detrimental socioeconomic impacts would not occur since the project would not be built.	Implementation of the Proposed Action Alternative would have a beneficial impact on the local economy due to minor increases in revenues for local business as a result of construction activities. The increase in construction workforce and revenue would be temporary. However, there would be a minor continuing beneficial impact due to a minor permanent increase in Fort Bliss personnel (128) for UAS training operations.
Environmental Justice and Protection of Children	No impacts on environmental justice or protection of children would occur.	No disproportionate health or environmental effects on minorities or low-income populations or communities would occur as a result of the Proposed Action Alternative, as none are located near the proposed UAS training complex.
Hazardous Materials and Waste	There would be no increase in the use and generation of hazardous materials and wastes on Fort Bliss.	A limited amount of potentially hazardous materials and waste and fuel would be used or generated at the proposed UAS training complex from construction, maintenance, and operational activities, including petroleum, oil, and lubricants (POL). Any hazardous wastes generated as part of this project would be disposed of or recycled according to the Installation Hazardous Waste Management Plan; therefore, impacts from hazardous materials and waste would be minor. No fuel storage is planned for the UAS training complex.
Energy Demand and Utilities	No construction, maintenance, or operation of a new training complex would occur; therefore, there would be no impacts.	Fort Bliss would extend utilities from existing coverage area, and no excess demand would be placed on energy capacity for Fort Bliss or the general area. An installed geothermal heat pump system would reduce energy demand at the proposed UAS training complex.
Radio Frequency and Spectrum Use	No changes to radio frequency or spectrum use would occur.	The proposed equipment to be used for the UAS control stations would meet or exceed requirements established by the Federal Communication Commission and MIL-STD-461F. Negligible impacts on radio frequency or spectrum use could occur due to equipment malfunction.
Traffic and Transportation	No changes for traffic and transportation resources would occur.	Traffic would increase slightly on roads around TA 4D during construction of the UAS training complex. Maintenance and ongoing operations of the UAS training complex would have negligible impacts on traffic or transportation within Fort Bliss or the region because the primary access road is already used for training activities. Approximately 1,700 feet of Hueco Camp Road would be paved, improving vehicular access.

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found in the Mission and Master Plan EIS (Army 2000), the Integrated Natural Resources Management Plan (INRMP) (Army 2001), and *GFS EIS* (Army 2010a), which are herein incorporated by reference.

3.2.1.1 Vegetation

Vegetation at the Proposed Action Alternative site consists mainly of honey mesquite (*Prosopis glandulosa*), along with other desert shrubs including creosote bush (*Larrea tridentata*), four-winged saltbush (*Atriplex canescens*), broom snakeweed (*Gutierrezia sarothrae),* and soaptree yucca (*Yucca elata*). Portions of the site show evidence of ground disturbance from past training operations involving military vehicles, and construction of an expedient airstrip (cleared to bare ground). These activities have modified (reduced) plant cover in places within the site.

3.2.1.2 Wildlife

The mesquite coppice dune community established throughout the Tularosa Basin has relatively low wildlife species diversity. Typical bird species for the area include Swainson's hawk (*Buteo swainsoni),* Chihuahuan raven (*Corvus cryptoleucus*), loggerhead shrike (*Lanius ludovicianus*), cactus wren (*Campylorhynchus brunneicapillus*), black-throated sparrow (*Amphispiza bilineata*), Scott's oriole (*Icterus parisorum*), northern mockingbird (*Mimus polyglottos*), western kingbird (*Tyrannus verticalis*), ash-throated flycatcher (*Myiarchus cinerascens*), curve-billed thrasher (*Toxostoma curvirostre*), and pyrrhuloxia (*Cardinalis sinuatus*) (Peterson and Zimmer 1998; Army 2000).

Mammals typically found in mesquite coppice dune community, such as the Proposed Action Alternative site, include black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus auduboni*), pocket mouse (*Chaetodipus spp.*), deer mouse (*Peromyscus maniculatus*), wood rat (*Neotoma spp.*), kangaroo rat (*Dipodomys spp.*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canus latrans*), bobcat (*Lynx rufus*), and oryx (*Oryx gazella*). Reptile species common to the area include whiptail lizard (*Aspidoscelis* spp.), greater earless lizard (*Cophosaurus texanus*), side-blotched lizard (*Uta stansburiana*), round-tailed horned lizard (*Phrynosoma modestum*), western diamondback rattlesnake (*Crotalus atrox*), and Sonoran gopher snake (*Pituophis catenifer affinis*).

3.2.1.3 Threatened and Endangered Species

No threatened or endangered species listed by the U.S. Fish and Wildlife Service (USFWS) or the State of New Mexico are expected at the Proposed Action Alternative site due to the absence of suitable habitat. No arroyo-riparian or wetland habitats exist in the affected area.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

No impacts on biological resources would occur because no construction would take place.

3.2.2.2 Proposed Action Alternative

Approximately 119.5 acres of mesquite coppice dune vegetation, which is a common vegetation community on Fort Bliss, would be impacted, and only 0.02 percent of this habitat on Fort Bliss would be removed for the Proposed Action Alternative. The loss of vegetation and wildlife habitat would be considered minor because of the vast amounts of similar habitat and vegetation

communities throughout Fort Bliss. To prevent the spread of noxious weeds from construction activities, the noxious weed monitoring and treatment program defined in the INRMP (Army 2001) and in the Fort Bliss Integrated Pest Management Plan (Fort Bliss DPW 2012) would be followed. The proposed overhead electrical lines would be constructed in accordance with avian protection guidelines outlined by the Avian Power Line Interaction Committee (APLIC 2006).

No Federally listed threatened or endangered species would be affected by the Proposed Action Alternative because the proposed UAS training complex is not located within potential habitat for species protected under the Endangered Species Act. The Proposed Action Alternative would occur in habitat that is utilized by common wildlife species, and some common species would be lost during construction. However, the small number of individuals and small amount of habitat expected to be lost would not appreciably reduce the overall population of any species found at Fort Bliss.

3.3 SOILS

3.3.1 Affected Environment

Fort Bliss lies within the Basin and Range physiographic province, a region covering much of the western U.S., consisting of prominent north-south-trending mountain ranges separated by expansive, sediment-filled basins. The proposed UAS training complex is located on Holocene (younger than 10,000 years before present) aeolian (wind-deposited) sand dunes and sand sheets in the Tularosa Basin. Underlying the Holocene sediments are older basin-fill gravels, sands, and finer sediments.

Soil mapping units and other soil data for Fort Bliss are found in the Soil Survey of Fort Bliss Military Reservation, New Mexico and Texas (USDA 2003). The proposed UAS training complex is located in the Copia-Nations complex. The Copia soil forms coppice dunes. Texture is predominantly loamy fine sand. The Nations soil forms alluvial flats where eolian sediments have been redeposited by water. The Nations soil also has a generally finer texture than the Copia soil, predominantly fine sandy loam. Additionally, a petrocalic ("caliche") horizon lies beneath much of the Tularosa Basin, including the proposed UAS training complex. This white soil, composed mainly of calcium carbonate, is usually found at a depth of several feet but can be exposed at the surface in places due to erosion or human activity.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

No ground-disturbing actions as a result of the construction of a new UAS training complex would occur; therefore, no impacts on soils would occur.

3.3.2.2 Proposed Action Alternative

Ground disturbance (approximately 119.5 acres) would be necessary to construct the UAS training complex and would directly impact soils at the proposed site. Long-term direct impacts would result from the disturbance of surface and near-surface soil horizons through heavy machinery and vehicle traverses associated with the construction of the UAS training complex. Although these impacts are considered long-term, they would not result in major impacts based upon the minimal amount of soils affected versus the overall area of similar soils within the

study area (over 165,000 acres within Fort Bliss). No prime or special farmland soils would be impacted.

Temporary indirect impacts would consist of possible soil erosion during construction activities; however, these impacts would be negligible to minor with the use of erosion control measures and the short duration of the construction process. Development of the UAS training complex site would require BMPs following Fort Bliss SWPPP guidance to control temporary fugitive dust and erosion during clearing and construction activities (Fort Bliss DPW 2013). The use of the BMPs such as the silt fences, water bars, gabions, and revegetation of any denuded soils would dramatically reduce potential erosion impacts. Construction stormwater management would comply with Section 438 of the EISA.

3.4 WATER RESOURCES

3.4.1 Affected Environment

3.4.1.1 Groundwater

Fort Bliss is located primarily in the Hueco and Tularosa Basins. The Hueco Bolson is an intermontane basin incised by the Rio Grande Valley, and most water for Fort Bliss is drawn from the Hueco Bolson. The El Paso Water Utilities also obtains their water from the Hueco Bolson. The part of the basin north of the Rio Grande is referred to as the Upper Hueco Bolson (Army 2001). It is estimated that the total annual recharge of the Hueco Bolson is approximately 5,600 acre-feet/year (Army 2001). The proposed UAS training complex site is located in the Hueco Bolson.

Potable water for the Hueco Camp area is supplied by Fort Bliss Water Company, which owns wells and an elevated water tower at Hueco Camp. Water is also available along the U.S. Highway 54 corridor from a water main that supplies McGregor Range Camp.

3.4.1.2 Surface Water

No Federally regulated wetlands, floodplains, arroyo-riparian drainages, or playa lakes as defined by the USACE under Section 404 of the Clean Water Act (CWA) of 1972 are located within or near the proposed UAS training complex site.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

No construction or operation of a new UAS training complex would occur; therefore, no direct impacts on water resources would occur.

3.4.2.2 Proposed Action Alternative

Groundwater would be used for dust suppression during the construction of the UAS training complex and for concrete. Impacts associated with the use of water for dust suppression would be minimal and temporary, lasting only during construction activities. Water used for washing and cleaning of the aircraft and daily operations would be obtained from existing supplies piped to the facilities, and all used wash water would be routed through an oil-water separator. An estimated 2.5 million gallons per year would be required for operation and maintenance of the new UAS training complex, based on 128 Soldiers working at the facility for 365 days per year.

However, the actual water use would likely be lower. To provide adequate potable water to the proposed UAS training complex, the existing water tank and facilities at Hueco Range Camp would be upgraded and used, or a new water supply line would be extended from the McGregor Range Camp supply line along the U.S. Highway 54 corridor. All wastewater from the UAS training complex would be sent to the septic disposal system installed at the site. Due to the minimal amount of water needed as a result of the Proposed Action Alternative, any impacts related to groundwater are considered negligible.

No Federally regulated waters of the U.S. would be impacted, as none are located near the UAS training complex site. Therefore, no impacts would occur on surface waters. A SWPPP following Fort Bliss SWPPP guidance would be developed outlining the BMPs and other measures to be undertaken to prevent stormwater runoff during and following construction (Fort Bliss DPW 2013). The stormwater drainage system for the UAS training complex site would comply with Section 438 of the EISA.

3.5 NOISE

3.5.1 Affected Environment

Noise is generally described as unwanted sound, which can be based either on objective impacts (e.g., hearing loss, damage to structures, etc.) or subjective judgments (e.g., community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 3 dB, and the threshold of discomfort or pain is around 120 dB (USEPA 1974).

Noise is common throughout Fort Bliss from gunfire, ordnance detonations, missile and rocket launches, aircraft and ground vehicles, and other sources. There are no civilian sensitive noise receptors near the proposed UAS training complex and the site is not located near military buildings.

3.5.2 Environmental Consequence

3.5.2.1 No Action Alternative

The implementation of the No Action Alternative would not change ambient noise quality in the region.

3.5.2.2 Proposed Action Alternative

No noise generated by either construction or operational activities would be heard beyond Fort Bliss boundaries; therefore, no noise impact as it relates to the general public would occur. Within Fort Bliss, noise generated by the construction and operational activities would be intermittent and temporary; however, there would be negligible impacts on the noise environment within Fort Bliss, since there are no sensitive noise receptors near the proposed UAS training complex or any of the proposed UAS flight paths. Noise generated by the Shadow and Grey Eagle UAS is essentially not audible when the UAS reach an altitude of 2,000 feet above ground level (Army 2012). The operational noise signature for the Grey Eagle and Shadow UAS is similar to that of a small single-engine private plane, and no sensitive noise receptors are located within hearing distance of the proposed UAS training complex.

3.6 CULTURAL RESOURCES

3.6.1 Affected Environment

Cultural resources are important because of their association or linkage to past events, historically important persons, design and construction values, and for their ability to yield important information about history. Fort Bliss manages cultural resources associated with all prehistoric and historic periods recognized in south-central New Mexico and western Texas. The *Fort Bliss Texas and New Mexico, Mission and Master Plan, Programmatic Environmental Impact Statement* (U.S. Army 2000) describes in detail the cultural history of Native Americans and post-contact inhabitants in the region. The *Integrated Cultural Resources Management Plan* (ICRMP) for Fort Bliss (Army 2008a) also contains detailed information about the history of Fort Bliss. Both documents are incorporated herein by reference and can be found at https://www.bliss.army.mil.

Cultural resources are regulated at Fort Bliss under the National Historic Preservation Act (NHPA) of 1966 (16 USC 470, et seq.), the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, the Archeological Resources Protection Act of 1979, and other statutes. Pursuant to Army Regulation AR 200-1, the Garrison Commander at Fort Bliss is responsible for managing the cultural resources on the installation in compliance with the NHPA and the Programmatic Agreement (PA) entered into by the Fort Bliss Garrison Commander, the Texas State Historic Preservation Officer (SHPO), the New Mexico SHPO, and the Advisory Council on Historic Preservation for the Management of Historic Properties on Fort Bliss.

Two archaeological surveys were carried out within and in areas immediately adjacent to the proposed UAS training complex site, resulted in the following. In 2012, TRC Environmental, Inc. (TRC), conducted an investigation of 116 acres for an earlier proposed footprint for the current project that partially eclipsed the southeastern portion of the proposed airstrip footprint discussed in this document (Garcés et.al 2012). The TRC investigation revisited three previously recorded sites and discovered one newly recorded site, all of which were recommended Not Eligible for the National Register of Historic Places (NRHP) and outside of the current proposed UAS training complex (Garcés et.al 2012).

In 2012, archaeologists from the Fort Bliss DPW-E and Vista Technical Services, LLC conducted a 129–acre survey of the current proposed UAS training complex (Burt 2012). The investigation revealed 23 isolated occurrences and one newly recorded site. The new site represents an unknown prehistoric site and is recommended not eligible for the NRHP (Burt 2012). SHPO concurrence with this recommendation has been received.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

No impacts on cultural resources would occur because no construction would take place.

3.6.2.2 Proposed Action Alternative

It is unlikely that construction of the proposed UAS training complex would result in adverse impacts on any significant historic properties; however, the potential exists for discovery of buried resources during excavation activities. Final siting of any access roads, utility lines, and

pole placements would be reviewed by DPW-E archaeologists prior to construction. Any required surveys would be conducted, and all recorded sites would be evaluated, and mitigated if necessary. If any sub-surface cultural resources are encountered during construction, the potential impacts would be properly addressed per Fort Bliss' PA with New Mexico SHPO. Any discovery of possible human remains would be treated in accordance with NAGPRA and the Standard Operations Procedures (SOPs) set out in the ICRMP.

Ongoing consultation by Fort Bliss with the Federally recognized tribes expressing interest at the proposed UAS training complex location has not revealed any resources of interest to the tribes. The proposed UAS training complex is not within the viewshed of a historic district.

3.7 AIR QUALITY

3.7.1 Affected Environment

3.7.1.1 National Air Quality Standards

The U.S. Environmental Protection Agency (USEPA) established National Ambient Air Quality Standards (NAAQS) for specific pollutants determined to be of concern with respect to the health and welfare of the general public (USEPA 2010a). Ambient air quality standards are classified as either "primary" or "secondary." The major pollutants of concern, or criteria pollutants, are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns (PM-10), particulate matter less than 2.5 microns (PM-2.5), and lead. NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare.

Areas that do not meet NAAQS standards are called non-attainment areas; areas that meet both primary and secondary standards are known as attainment areas. The Federal Conformity Final Rule (40 CFR Parts 51 and 93) specifies criteria or requirements for conformity determinations for Federal projects. The Federal Conformity Final Rule was first promulgated in 1993 by the USEPA, following the passage of Amendments to the Clean Air Act in 1990. The rule mandates that a conformity analysis must be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS.

A conformity analysis is the process used to determine whether a Federal action meets the requirements of the General Conformity Rule. It requires the responsible Federal agency to evaluate the nature of a proposed action and associated air pollutant emissions, and calculate emissions as a result of the proposed action. If the emissions exceed established limits, known as *de minimis* thresholds, the proponent is required to implement appropriate mitigation measures. Federal and most states' agencies segregate airsheds by county boundaries. In other words, the USEPA, New Mexico Environment Department (NMED), and Texas Commission on Environmental Quality (TCEQ) monitor air emissions by county. The proposed UAS training complex at Fort Bliss and the UAS operations are located in two counties in New Mexico. Table 3-2 presents the counties in which the UAS training complex and flight operations are located, as well as the counties' attainment status for NAAQS.

Table 3-2. Fort Bliss Counties and NAAQS Status

Project Sites	County	NAAQS Attainment Status
McGregor Range	Otero	In attainment for all NAAQS
Doña Ana Range	Doña Ana	Non-attainment for PM-10 is limited to the city limits of Anthony, New Mexico

Source: USEPA 2010b

3.7.1.2 Greenhouse Gases (GHG) and Climate Change

Global climate change refers to a change in the average weather on the earth. GHG are gases that trap heat in the atmosphere. They include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases including chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HFC), and halons, as well as ground-level O_3 (California Energy Commission 2007). The major GHG-producing sectors in society include transportation, utilities (e.g., coal and gas power plants), industry/manufacturing, agriculture, and residential (California Energy Commission 2007).

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

The No Action Alternative would not result in any direct impacts on air quality, since a new UAS training complex would not be constructed, and the Grey Eagle and Shadow UAS would not be deployed at the proposed site.

3.7.2.2 Proposed Action Alternative

Temporary and minor increases in air pollution would occur from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction of the UAS training complex. Air emissions were calculated for fugitive dust emissions during construction. Construction workers would temporarily increase the combustion emissions in the airshed during their commute to and from the construction area. Emissions from delivery trucks would also contribute to the overall air emission budget. Operational air emissions refer to air emissions that would occur during UAS flight operations, and would include Soldier commuter vehicles traveling to and from the UAS training complex. Emission calculations for construction and emissions produced during daily operation of the UAS training complex and the UAS are included in Appendix B.

Based upon the calculations, PM-10 air emissions from the proposed construction and operational activities do not exceed Federal *de minimis* thresholds. As there are no violations of air quality standards and no conflicts with the state implementation plans, the impacts on air quality in Doña Ana, and Otero counties from the implementation of the Proposed Action Alternative would be minor.

The operations of the Grey Eagle and Shadow UAS would use fossil fuel (diesel and gasoline) that emits GHG, and would slightly increase emissions in the Fort Bliss airshed. However, the relatively small number of UAS operations, when compared with the normal ongoing Fort Bliss aircraft training missions and ground vehicle use, would result in minimal emissions increase.

3.8 AIRSPACE

3.8.1 Affected Environment

The Army manages airspace in accordance with DoD Directive 5030.19, *Responsibilities on Federal Aviation and National Airspace System Matters* (DoD 1997). The Army implements these requirements through AR 95-2, *Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids* (Army 2008b). Airspace over the McGregor Range and Doña Ana Range training areas is restricted for military use and designated as Special Use Airspace (SUA) R5107A and K and R5103A, B and C. Use of military airspace on Fort Bliss is scheduled through the Directorate of Plans, Training, Mobilization and Security (DPTMS), McGregor Base Camp - Range Operations. An existing COA issued by the FAA for Shadow operations across U.S. Highway 54 is in effect for Fort Bliss (FAA 2012) (COA included in Appendix C).

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

No impacts on airspace operations would occur, because no UAS training complex construction or Grey Eagle and new Shadow UAS operations would take place.

3.8.2.2 Proposed Action Alternative

There would be no change in the airspace designation. All Grey Eagle and Shadow UAS operations would take place within existing Fort Bliss restricted airspace. All UAS flights over the U.S. Highway 54 corridor would use the existing COA developed for that purpose, modified as appropriate. The impact on airspace operations would be negligible and would be limited to coordination of UAS missions with other Fort Bliss aircraft training flights through the DPTMS, McGregor Base Camp - Range Operations.

3.9 HEALTH AND SAFETY

3.9.1 Affected Environment

Federal, state, and Fort Bliss guidelines, rules, and regulations are in place to protect personnel throughout the installation. Safety information and analysis is found in literature published by Fort Bliss, such as Fort Bliss Regulation 385-63 and AR 385-10, *Army Safety Program* (Army 2011d). Health programs are promoted through U.S. Army Public Health Command and Medical Command. Various Fort Bliss procedures have also been established to meet health and safety requirements. Health hazards throughout the Installation could include exposure to unexploded ordnance (UXO), dehydration and heat illness, venomous animals, or vehicle accidents.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

No impacts on health and safety would occur because no UAS training complex construction activities would occur.

3.9.2.2 Proposed Action Alternative

During construction of the UAS training complex, all applicable Occupational Safety and Health Administration (OSHA) rules and regulations would be followed by Fort Bliss pursuant to Army

Regulation 385-10, *Army Safety Program* (Army 2011d), and by project contractors. Heavy equipment operation areas and trenching locations would be secured to prevent inadvertent public access. The entire Grey Eagle airfield facility would be enclosed by perimeter fencing and public access would not be allowed without approval by Fort Bliss.

The proposed UAS training complex is located in a military training area, and as such there is a small potential for encountering UXO during construction. The proposed construction site is not within a known dud ordnance or munitions impact area. The proposed UAS training complex site was surveyed for UXO by the U.S. Army Engineering and Support Center, Huntsville, on 23 and 24 January 2013. Numerous expended munitions were recovered, including small arms shells, large cannon casings, rocket motors and projectiles, and smoke grenades, but no live or dud munitions were found. The site was classified as a low risk for encountering explosive hazards, and standard contractor awareness training and on-call support with Fort Bliss Explosive Ordnance Division is recommended.

The Grey Eagle UAS could be loaded with live Hellfire missiles for training exercises. There are no plans to arm the Shadow UAS at the new UAS training complex. Loading of aircraft with Hellfire missiles or other ordnance would be done within the live hot zone loading area at the northwest end of the Grey Eagle airfield (see Figure 2-1). This loading area would be designed with berms to minimize and direct any accidental detonation or firing of ordnance away from other airfield personnel and civilian population areas. A model depiction of the potential Surface Danger Zone (SDZ) around the hot zone loading area is shown in Figure 3-1. No impacts on civilian population areas to the south (4.5 miles away) would occur in the event of an accidental detonation or launch from the loading area. No ordnance or munitions would be stored at the UAS training complex. All missiles would be transported daily, and returned if necessary, from existing ordnance storage facilities on Fort Bliss.

In order to minimize the risk to civilians off-base, the following measures would be implemented, as previously discussed:

- All UAS flights would be conducted within Fort Bliss restricted airspace, with no flights over civilian areas.
- All pilots and other UAS operations personnel would be trained, with qualifications and experience specified in the FAA COA for UAS flights on Fort Bliss (see Appendix C).
- All UAS flights crossing U.S. Highway 54 would be within crossing corridors established in the COA, following FAA requirements to avoid civilian aircraft conflicts.
- In the event of a communications lost-link with a UAS, the aircraft would automatically orbit over a designated position on military maneuver land until communication is reestablished or the UAS has depleted its fuel and descends to the ground. These established lost-link sites are well-removed from any civilian population areas and would be evacuated of military personnel if lost-link procedures are invoked.
- All ordnance loading would take place within a bermed safe zone at the UAS training complex to prevent risk to civilian population areas in the event of accidental detonation or launch.

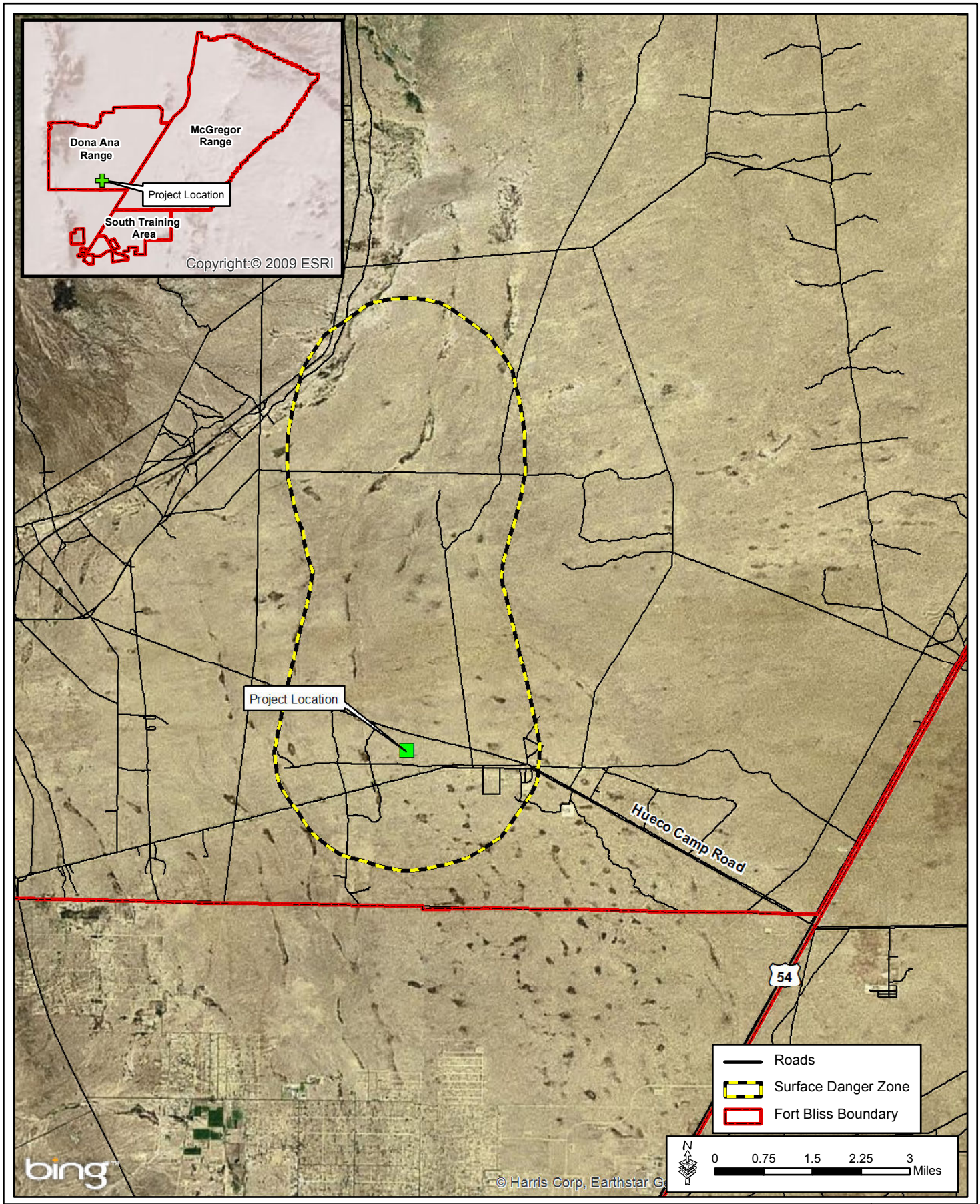

Figure 3-1: Surface Danger Zone for Loading Hellfire Missiles

GSRC

November 2012

Therefore, no risks to civilians outside Fort Bliss are expected; and only negligible to minor impacts on the health and safety of Fort Bliss personnel would be expected as a result of the Proposed Action Alternative.

3.10 SOCIOECONOMICS

3.10.1 Affected Environment

Socioeconomics includes the civilian population and economy of the general area around Fort Bliss. Socioeconomics in the region of influence (ROI) for the proposed UAS training complex were discussed in detail in the *SEIS* (Army 2007a) and the *GFS EIS* (Army 2010a), and those discussions are herein incorporated by reference. The ROI is defined as the geographic area where the majority of any potential direct and indirect socioeconomic effects of actions on Fort Bliss are likely to occur.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

No direct impacts on socioeconomics would occur, as no construction activities would take place.

3.10.2.2 Proposed Action Alternative

Implementation of the Proposed Action Alternative would provide a beneficial impact on the local economy due to increases in revenues for local business as a result of construction activities and materials obtained. Most of the increase in workforce and revenue would be temporary, lasting only as long as construction. There would be some permanent residual work required for long-term operation and maintenance of the training complex. An additional 128 military personnel would be stationed at Fort Bliss during UAS training activities, resulting in a minor beneficial impact on housing and increased spending in the Fort Bliss area.

3.11 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

3.11.1 Affected Environment

Executive Order (EO) 12898, Environmental Justice, was signed by President Clinton in February 1994. This action requires all Federal agencies to identify and address disproportionately high and adverse effects of programs, policies, and activities on minority and low-income populations. The ROI for the proposed project has a high minority percentage (approximately 77 percent); however, all activities would be located within Fort Bliss where no minority populations exist.

EO 13045, Protection of Children, requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. All activities would be within the boundaries of Fort Bliss, in remote areas located away from neighborhoods, parks, or places that could potentially create a risk to children.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

No impacts on environmental justice or protection of children would occur because no construction activities would take place.

3.11.2.2 Proposed Action Alternative

No disproportionate health or environmental effects on minorities or low-income populations or communities would occur as a result of the Proposed Action Alternative, as none are located near the proposed UAS training complex. Additionally, since there are no communities near the UAS training complex, no impacts on children would occur. All UAS operations would take place within Fort Bliss restricted airspace and on military maneuver areas, and there would be no impacts on civilian populations in the event of a UAS malfunction.

3.12 HAZARDOUS MATERIALS AND WASTE

3.12.1 Affected Environment

Hazardous materials are substances that cause human physical or health hazards (29 CFR 1910.1200). Materials that are physically hazardous include combustible and flammable substances, compressed gases, and oxidizers. Health hazards are associated with materials that cause acute or chronic reactions, including toxic agents, carcinogens, and irritants. Hazardous materials are regulated in New Mexico by a combination of mandated laws promulgated by the USEPA and NMED. In addition to the mandates established by these agencies, Fort Bliss manages hazardous materials under the Installation Hazardous Waste Management Plan.

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

No direct impacts from hazardous materials and waste would occur because no UAS training complex construction or UAS operations would occur.

3.12.2.2 Proposed Action Alternative

Heavy equipment would be used to construct and maintain the UAS training complex and would require the use of petroleum, oil, and lubricants (POL). POL would be stored at the UAS training complex in a secure location with proper cleanup equipment readily available in case of a spill. Fuel for UAS operations would be delivered as needed by truck, and no fuel storage is planned for the UAS training complex.

The refueling of machinery would be completed following accepted guidelines, and all vehicles would have drip pans during storage to contain minor spills and drips. All handling and disposal of hazardous wastes would follow rules and guidance established in the Installation Hazardous Waste Management Plan. The potential impacts of the handling and disposal of hazardous and regulated materials and substances during project implementation would be minor when BMPs are implemented in accordance with the Plan.

Control of invasive and exotic species, as well as native species within the clear zones, at the UAS training complex would occur under the Proposed Action Alternative, in accordance with the Fort Bliss Integrated Pest Management Plan. Exposure to herbicides could pose a minor

health and safety risk to those that are immediately involved with the application of the herbicide. However, all proper personal protection equipment and strict adherence to manufacturers' guidelines for the use of the chemicals would occur, thereby minimizing the potential for adverse impacts.

3.13 ENERGY DEMAND AND UTILITIES

3.13.1 Affected Environment

Fort Bliss receives its energy from El Paso Electric (EPE). The net installed energy generation resources owned by EPE are approximately 1,643 megawatts (MW) in 2010. This includes the use of power sources outside the El Paso region. Within the El Paso region, EPE owns approximately 900 MW of local generation (EPE 2011).

In 2010, the base load for energy usage on Fort Bliss was approximately 30 to 40 MW, with a peak load of 65 MW during heavy usage times, such as during the heat of the summer. The projected electrical consumption for Fort Bliss in 2015 is an 80 MW base load, 130 MW peak load, and 500,000 megawatt hours of annual energy consumption (Tomlinson 2011).

Communications lines are located along Hueco Camp Road, with direct access to McGregor Range Camp. Sanitary sewer facilities are not available in the vicinity of the proposed UAS training complex, and septic systems are normally used for that purpose. Potable water is currently available from the Hueco Camp elevated water tank.

3.13.2 Environmental Consequences

3.13.2.1 No Action Alternative

No construction, maintenance, or operation of new UAS training complex would occur, and no additional energy requirements or utilities would be needed.

3.13.2.2 Proposed Action Alternative

Electrical requirements for the proposed UAS training complex would be supplied by a new power distribution line along Route Black from the Doña Ana Range Camp substation (see Figure 2-1). The power line would be a combination of overhead and underground service. Additional electrical demand would be negligible. Potable water would be supplied either through a new water main connecting to an existing water main located along U.S. Highway 54 or from an updated Hueco Camp elevated water tank and well located on the south side of Hueco Camp Road (see Figure 2-1), and additional groundwater demand would be negligible. All water facilities would be owned and managed by Fort Bliss Water Company. The sanitary sewer system for the proposed training complex would consist of two septic tanks (3,000 gallons total) with a 750-square-foot leach field. An installed geothermal heat pump system would reduce energy demand at the complex. Additional communications lines would be added from the McGregor Range Camp, as needed.

3.14 RADIO FREQUENCY AND SPECTRUM USE

3.14.1 Affected Environment

Communications systems interference includes negative impacts on radar and navigation aids, and interference with military radio frequencies. Radar interference occurs when objects are placed too close to a radar antenna and reflect or block the transmissions of signals between the antenna and receiver. Impacts on navigation aids occur when beacon signals used by aircraft cause unintended navigation errors for other aircraft.

3.14.2 Environmental Consequences

3.14.2.1 No Action Alternative

No impacts on radio frequency and spectrum use would occur because no construction activities or UAS operations would occur.

3.14.2.2 Proposed Action Alternative

Radio frequency interference could occur due to malfunctions of ground or aircraft communications systems in UAS operations; however, that possibility is remote. All UAS communications would utilize frequencies that are approved for that purpose (MIL-STD-461F) that do not interfere with other military or civilian air traffic frequencies and, thus, would cause no disruption (DoD 2007). No radar or navigation facilities are located near the proposed UAS training complex.

3.15 TRAFFIC AND TRANSPORTATION

3.15.1 Affected Environment

Primary access to the new UAS training complex is available through the use of U.S. Highway 54, which is a public-maintained and civilian-used roadway, as well as Hueco Camp Road (semi-improved at east end), which is used for Fort Bliss military traffic. Civilians have to obtain clearance from Range Control prior to use of Hueco Camp Road within Fort Bliss' interior.

3.15.2 Environmental Consequences

3.15.2.1 No Action Alternative

No impacts on traffic or transportation would occur, as no construction activities would take place.

3.15.2.2 Proposed Action Alternative

Traffic would become slightly heavier on the Fort Bliss access roads to TA 4D during construction of the UAS training complex. However, this is expected to only occur during the delivery of and removal of construction equipment and materials, which could range up to 2 years. Maintenance and ongoing operations of the UAS training complex would not impact traffic or transportation within Fort Bliss or the region because Hueco Camp Road is normally used for military training vehicles and limited civilian traffic. Approximately 1,700 feet of Hueco Camp Road would be paved up to the entrance to the Grey Eagle facility to improve access. Therefore, the potential impacts on traffic and transportation as a result of the Proposed Action Alternative would be negligible and temporary, and all permanent impacts would be limited to Fort Bliss roads and traffic.

SECTION 4.0
CUMULATIVE IMPACTS

4.0 CUMULATIVE IMPACTS

Cumulative impacts are defined as the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Although the Proposed Action Alternative is not specifically addressed in the *SEIS* (Army 2007a) and *GFS EIS* (Army 2010a), the cumulative impacts on the natural and human environment from construction of a UAS training complex and support infrastructure on Doña Ana Range, McGregor Range, and the South Training Area are covered by these documents. The Proposed Action Alternative will not significantly change that analysis.

The continued development of infrastructure on Fort Bliss and in surrounding areas could have cumulative impacts on nearby non-military land uses. The *SEIS* (Army 2007a) and *GFS EIS* (Army 2010a) identified several projects that would result in continued development and use of lands on and surrounding Fort Bliss. Development of infrastructure on Fort Bliss and in surrounding areas would continue to result in increased noise, loss and degradation of soils, vegetative communities, and wildlife habitat, and increased surface water runoff with accelerated erosion and sedimentation, and could allow for the introduction and expansion of invasive species. Although the construction and operation of the new UAS training complex would contribute to these adverse effects, the cumulative effects of the Proposed Action Alternative would be minimal. Much of the undeveloped land on Fort Bliss and surrounding areas is already partially degraded as a result of past and current uses (e.g., grazing, urban development, military training activities).

Recent and proposed activities on Fort Bliss include:

- Proposed expansion of restricted airspace to allow for increased Army aircraft operations and live fire exercises
- Development of a new machine gun and grenade range on East Bliss
- Exchange and sale of Fort Bliss land near Montana Avenue for future development
- Development of training villages for live fire exercises on the McGregor Range
- Construction of an Immigration and Customs Enforcement complex on Fort Bliss land on Montana Avenue
- Development of solar-photovoltaic power facilities on Fort Bliss land

In general, opportunities for avoiding, minimizing, or mitigating cumulative impacts related to the Proposed Action Alternative have been incorporated by design or through the management processes to address the direct and indirect impacts identified in the *SEIS* (Army 2007a) and *GFS EIS* (Army 2010a). They include such measures as siting and consolidating facilities to reduce the area affected; ensuring land use compatibility in the Real Property Master Plan; energy-efficient facility design; executing a PA for historic properties; implementing projects in the INRMP; promoting a sustainable range and training base through the Integrated Training Area Management program; and maintaining Stormwater Management, SPCCP, and Pollution Prevention plans. Fort Bliss has an Environmental Management System to monitor environmental compliance and waste reduction metrics and to provide data for adaptive management programs in the future.

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SECTION 5.0
SUMMARY OF MITIGATION MEASURES

5.0 SUMMARY OF MITIGATION MEASURES

The following is a summary of the mitigation measures identified under the Proposed Action Alternative:

- To prevent the spread of noxious weeds from construction activities, the noxious weed monitoring and treatment program established by Fort Bliss in the INRMP and the Integrated Pest Management Plan would be followed.
- BMPs, including installation of avian protection features on power lines in accordance with APLIC guidelines, would be implemented to minimize impacts on wildlife.
- Final siting of any access roads, utility lines, and pole placements would be reviewed by DPW-E archaeologists prior to construction. Any required surveys would be conducted, and all recorded sites would be evaluated, and mitigated if necessary. If any sub-surface cultural resources are encountered during the construction of the UAS training complex, they would be properly addressed per Fort Bliss' PA with New Mexico SHPO. Any discovery of possible human remains would be treated in accordance with NAGPRA and the SOPs set out in the ICRMP.
- Fuel for construction equipment would be transported and stored on-site in designated areas. All handling of hazardous materials and wastes will follow procedures specified in the Installation Hazardous Waste Management Plan.
- A SWPPP and BMPs following Fort Bliss SWPPP Guidance (Fort Bliss 2013) would be developed and implemented to control stormwater runoff, erosion, and temporary fugitive dust.

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SECTION 6.0
ACRONYMS AND ABBREVIATIONS

6.0 ACRONYMS AND ABBREVIATIONS

AAF	Army Airfield
APLIC	Avian Power Line Interaction Committee
Army	Department of the Army
BAAF	Biggs Army Airfield
BLM	Bureau of Land Management
BMP	Best Management Practice
BRAC	Base Closure and Realignment Commission
CAB	Combat Aviation Brigade
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFC	chlorofluorocarbons
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
COA	Certificate of Authorization
CWA	Clean Water Act
DoD	Department of Defense
DPTMS	Directorate of Plans, Training, Mobilization and Security
DPW-E	Directorate of Public Works-Environmental Division
dB	decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence Security Act
EO	Executive Order
EPE	El Paso Electric
FAA	Federal Aviation Administration
FBTC	Fort Bliss Training Center
FNSI	Finding of No Significant Impact
FORSCOM	Forces Command
Fort Bliss	Fort Bliss Military Reservation
FY	fiscal year
GC	Garrison Commander
GFS EIS	Growth and Force Structure Realignment EIS
GHG	greenhouse gases
GSRC	Gulf South Research Corporation
HBCT	Heavy Brigade Combat Team
HFC	hydrochlorofluorocarbons
IBCT	Infantry Brigade Combat Team
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
LCEA	Life Cycle Environmental Assessment
LEED	Leadership in Engineering and Environmental Design
LINR	Locally Important Natural Resources
MBTA	Migratory Bird Treaty Act

1	MIL-STD	Military Standard
2	MOU	Memorandum of Understanding
3	MW	megawatts
4	N_2O	nitrous oxide
5	NAAQS	National Ambient Air Quality Standards
6	NAGPRA	Native American Graves Protection and Repatriation Act
7	NDAA	National Defense Authority Act of 2007
8	NEPA	National Environmental Policy Act
9	NHPA	National Historic Preservation Act
10	NOI	Notice of Intent
11	NM	New Mexico
12	NMED	New Mexico Environmental Department
13	NMWA	New Mexico Wilderness Alliance
14	NRCS	Natural Resources Conservation Service
15	NRHP	National Register of Historic Places
16	NPDES	National Pollutant Discharge Elimination System
17	NO_2	nitrogen dioxide
18	NOI	Notice of Intent
19	O_3	ozone
20	OSHA	Occupational Safety and Health Administration
21	PA	Programmatic Agreement
22	PL	Public Law
23	PM-10	particulate matter measuring less than 10 microns
24	PM-2.5	particulate matter measuring less than 2.5 microns
25	POL	petroleum, oils, and lubricants
26	ROD	Record of Decision
27	ROI	Region of Influence
28	ROW	right-of-way
29	SDZ	Surface Danger Zone
30	SEIS	Supplemental Environmental Impact Statement
31	SHPO	State Historic Preservation Officer
32	SO_2	sulphur dioxide
33	SOPs	Standard Operating Procedures
34	SPCCP	Spill Prevention, Control, and Countermeasures Plan
35	SUA	Special Use Airspace
36	SWPPP	Stormwater Pollution Prevention Plan
37	TA	Training Area
38	UAS	unmanned aircraft system
39	USAF	U.S. Air Force
40	USC	United States Code
41	USACE	U.S. Army Corps of Engineers
42	USDA	U.S. Department of Agriculture
43	USEPA	U.S. Environmental Protection Agency
44	USFWS	U.S. Fish and Wildlife Service
45	UXO	unexploded ordnance
46	VEC	Valued Environmental Components

WSMR	White Sands Missile Range
yr	year

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SECTION 7.0
REFERENCES

7.0 REFERENCES

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SECTION 8.0
LIST OF PREPARERS

8.0 LIST OF PREPARERS

The following people were primarily responsible for preparing this Environmental Assessment.

Name	Agency/Organization	Discipline/ Expertise	Experience	Role in Preparing EA
Eric Webb, Ph.D.	Gulf South Research Corporation	Oceanography/Coastal Sciences	20 years natural resources and NEPA studies	EA review and comment; Meetings and coordination
Chris Ingram	Gulf South Research Corporation	Biology/Ecology	34 years EA/EIS studies	EA review
Steve Oivanki	Gulf South Research Corporation	Geology/NEPA	23 years natural resources and NEPA studies	Project Manager and EA Preparation
Steve Kolian	Gulf South Research Corporation	Environmental Science	14 years natural resources	Noise, Air Quality
Chris Cothron	Gulf South Research Corporation	GIS/Graphics	2 years GIS/graphics experience	GIS analysis and graphics
Mark Walker	Gulf South Research Corporation	Forestry/Natural Resource Management	30 years natural resources and NEPA studies	EA review and comment
John Barrera	Fort Bliss Directorate of Public Works Environmental Division	NEPA Program Manager	20 years NEPA studies	Fort Bliss Project Manager; EA review and comment
John Kipp	Fort Bliss Environmental Division, NEPA Planner	Soil science, Geomorphology	25 years earth science and NEPA studies	Fort Bliss Project Manager; EA review and comment

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APPENDIX A
INTERAGENCY AND PUBLIC COORDINATION

Libraries

Alamogordo Public Library
920 Oregon Ave
Alamogordo, NM 88310

El Paso Main Public Library
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Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
James S. Lane, Jr.

Daniel E. Brooks, Deputy Director

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DEPARTMENT OF GAME & FISH

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Albuquerque, NM

BILL MONTOYA
Alto, NM

January 23, 2013

Mr. John Barrera
NEPE Program Manager
Bldg. 624 Taylor Road
Fort Bliss, TX 79916-6812

Grey Eagle and Shadow Unmanned Aircraft System Airfield Construction Draft Environmental Assessment, NMDGF Doc. No. 15447

Dear Mr. Barrera:

The Department of Game and Fish (Department) has reviewed the draft environmental assessment regarding the above-referenced project. The Department does not anticipate adverse effects to wildlife or important wildlife habitats from implementation of this project.

We appreciate the opportunity to comment on this project. Should you have any questions regarding these comments, please contact Mark Watson, Habitat Specialist, of my staff at (505) 476-8115 or mark.watson@state.nm.us.

Sincerely,

Kenneth K. Cunningham
Assistant Chief, Technical Guidance Section
Conservation Services Division

CC: USFWS NMES Office
George Farmer, Southeast Area Regional Habitat Biologist, NMDGF
Donald Auer, Habitat Manger, NMDGF

THE
NAVAJO
NATION

Historic Preservation Department, POB 4950, Window Rock, AZ 86515 • PH: 928.871-7198 • FAX: 928.871.7886

BEN SHELLY
PRESIDENT

REX LEE JIM
VICE-PRESIDENT

January 30, 2013

Brian D. Knight
Chief, Conservation Branch
Department of the Army
US Army Installation Management Command
HQ., United States Army Garrison, Fort Bliss
1 Perishing Road
Fort Bliss, TX 79916-3803

Dear Mr. Knight:

The Navajo Nation Historic Preservation Department-Traditional Culture Program (NNHPD-TCP) is in receipt of the proposed project where the Army is preparing an Environmental Assessment for the construction and operation of airfields for the Grey Eagle and Shadow Unmanned Aircraft Systems on Fort Bliss.

After reviewing your consultation documents, NNHPD-TCP has concluded the proposed undertaking/project area **will not impact** Navajo traditional cultural resources. The NNHPD-TCP, on behalf of the Navajo Nation has no concerns at this time.

However, the determination made by the NNHPD-TCP does not necessarily mean that the Navajo Nation has no interest or concerns with the proposed project. During construction should the proposed project inadvertently discover habitation sites, plant gathering areas, human remains and objects of cultural patrimony, the NNHPD-TCP request that we be notified respectively in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). *The Navajo Nation claims cultural affiliation to all Anaasazi people (periods from Archaic to Pueblo IV) of the southwest. The Navajo Nation makes this claim through Navajo oral history and ceremonial history, which has been documented as early as 1880 and taught from generation to generation.*

The NNHPD-TCP appreciates The Department of the Army's consultation efforts, pursuant to 36 CFR Pt. 800.1 (c)(2)(iii). Should you have any additional concerns and/or questions do not hesitate to contact me electronically at tony@navajohistoricpreservation.org or telephone at 928-871-7750.

Sincerely,

Tony H. Joe, Jr., Supervisory Anthropologist (Section 106 Consultation) Navajo Nation Historic Preservation Department-Traditional Culture Program

TCP 13-33
cc: Office File/Chrono

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BLISS
1 PERSHING ROAD
FORT BLISS, TX 79916-3803

REPLY TO
ATTENTION OF:

IMBL-PWE

JAN 09 2013

See Distribution List

Dear Sir or Madam:

The Army is preparing an Environmental Assessment (EA) for the construction and operation of airfields for the Grey Eagle and Shadow Unmanned Aircraft Systems on Fort Bliss. The proposed locations of the airfields are in Training Area 4D of the Dona Ana Training complex, New Mexico. The EA will assess the potential environmental consequences on both the natural and human environment associated with this proposed action. Details including the draft purpose, need, and description of the proposed action and alternatives (DOPAA) are attached for your information.

The EA will also examine the cumulative effects resulting from the proposed action when combined with past, present, and future proposals. In support of this process, we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis. The Army will initiate Section 106 and other consultation regarding this proposed action under a separate correspondence, as required.

Please forward any comments you may have within 30 days of receipt of this letter to John Barrera, NEPA Program Manager, Bldg. 624 Taylor Road, Fort Bliss, TX 79916-6812 or email to john.f.barrera.civ@mail.mil. A comment sheet is attached for your use, if desired.

Thank you in advance for your cooperation and assistance in this effort.

Sincerely,

Brian D. Knight, M.A., RPA
Chief, Conservation Branch
Environmental Division
Directorate of Public Works
Fort Bliss, Texas

Attachment:
1. Distribution List
2. Draft DOPAA
3. Comment Sheet

APPENDIX B
AIR QUALITY CALCULATIONS

CALCULATION SHEET-COMBUSTION EMISSIONS-CONSTRUCTION

Assumptions for Combustion Emissions					
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs
Water Truck	1	300	8	240	576,000
Diesel Road Compactors	1	100	8	15	12,000
Diesel Dump Truck	1	300	8	15	36,000
Diesel Excavator	1	300	8	15	36,000
Diesel Hole Trenchers	1	175	8	15	21,000
Diesel Bore/Drill Rigs	1	300	8	15	36,000
Diesel Cement & Mortar Mixers	2	300	8	130	624,000
Diesel Cranes	0	175	8	0	-
Diesel Graders	2	300	8	130	624,000
Diesel Tractors/Loaders/Backhoes	1	100	8	130	104,000
Diesel Bulldozers	1	300	8	40	96,000
Diesel Front-End Loaders	2	300	8	40	192,000
Diesel Forklifts	2	100	8	130	208,000
Diesel Generator Set	2	40	8	130	83,200

Emission Factors[1]							
Type of Construction Equipment	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO2 g/hp-hr	CO2 g/hp-hr
Water Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Road Compactors	0.370	1.480	4.900	0.340	0.330	0.740	536.200
Diesel Dump Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Excavator	0.340	1.300	4.600	0.320	0.310	0.740	536.300
Diesel Trenchers	0.510	2.440	5.810	0.460	0.440	0.740	535.800
Diesel Bore/Drill Rigs	0.600	2.290	7.150	0.500	0.490	0.730	529.700
Diesel Cement & Mortar Mixers	0.610	2.320	7.280	0.480	0.470	0.730	529.700
Diesel Cranes	0.440	1.300	5.720	0.340	0.330	0.730	530.200
Diesel Graders	0.350	1.360	4.730	0.330	0.320	0.740	536.300
Diesel Tractors/Loaders/Backhoes	1.850	8.210	7.220	1.370	1.330	0.950	691.100
Diesel Bulldozers	0.360	1.380	4.760	0.330	0.320	0.740	536.300
Diesel Front-end Loaders	0.380	1.550	5.000	0.350	0.340	0.740	536.200
Diesel Forklifts	1.980	7.760	8.560	1.390	1.350	0.950	690.800
Diesel Generator Set	1.210	3.760	5.970	0.730	0.710	0.810	587.300

CALCULATION SHEET-COMBUSTION EMISSIONS-CONSTRUCTION

1. Emission factors (EF) were generated using USEPA's preferred model for nonroad sources, the NONROAD2008 model. Emissions were modeled for the 2007 calendar year. The VOC EFs include exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2008 model are diurnal, hotsoak, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2008 model is based on the population in U.S. for the 2007 calendar year.

Emission Calculations							
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO_2 tons/yr	CO_2 tons/yr
Water Truck	0.279	1.314	3.485	0.260	0.254	0.470	340.227
Diesel Road Paver	0.005	0.020	0.065	0.004	0.004	0.010	7.091
Diesel Dump Truck	0.017	0.082	0.218	0.016	0.016	0.029	21.264
Diesel Excavator	0.013	0.052	0.182	0.013	0.012	0.029	21.276
Diesel Hole Cleaners\Trenchers	0.012	0.056	0.134	0.011	0.010	0.017	12.399
Diesel Bore/Drill Rigs	0.024	0.091	0.284	0.020	0.019	0.029	21.014
Diesel Cement & Mortar Mixers	0.419	1.595	5.006	0.330	0.323	0.502	364.247
Diesel Cranes	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Diesel Graders	0.241	0.935	3.253	0.227	0.220	0.509	368.786
Diesel Tractors/Loaders/Backhoes	0.212	0.941	0.827	0.157	0.152	0.109	79.206
Diesel Bulldozers	0.038	0.146	0.504	0.035	0.034	0.078	56.736
Diesel Front-end Loaders	0.080	0.328	1.058	0.074	0.072	0.157	113.451
Diesel Forklift	0.454	1.779	1.962	0.319	0.309	0.218	158.342
Diesel Generator Set	0.111	0.345	0.547	0.067	0.065	0.074	53.847
Total Emissions	**1.906**	**7.683**	**17.525**	**1.533**	**1.492**	**2.231**	**1,618**

Conversion factors	
Grams to tons	1.102E-06

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS-
DELIVERY MATERIALS AND COMMUTING DURING CONSTRUCTION ACTIVITIES

MOVES 2010a					
Source	**Fuel type**	**Number of vehicles**	**Miles traveled per day**	**Days of travel per year**	**Miles traveled per year**
Passenger cars	Gasoline	30	60	240	432,000
Passenger truck	Gasoline	30	60	240	432,000
Light commercial truck	Diesel	2	60	240	28,800
Short-haul truck	Diesel	4	120	240	115,200
Long-haul truck	Diesel	1	80	240	19,200

Emission Factors (MOVES 2010a Emission Rates)[1]							
Source	**VOC (g/mile)**	**CO (g/mile)**	**NOx (g/mile)**	**PM-10 (g/mile)**	**PM-2.5 (g/mile)**	**SO_2 (g/mile)**	**CO_2 and CO_2 Equivalents (g/mile)**
Passenger cars	8.497	2.892	0.576	0.019	0.018	0.005	320
Passenger truck	3.645	5.449	1.168	0.027	0.025	0.007	439
Light commercial truck	4.460	2.158	2.986	0.164	0.190	0.005	609
Short-haul truck	2.438	2.273	6.095	0.270	0.313	0.007	929
Long-haul truck	2.519	3.610	14.776	0.625	0.726	0.016	2,020

Total Emission for On-Road Construction Activities (tons/year)							
Source	**VOC**	**CO**	**NOx**	**PM-10**	**PM-2.5**	**SO_2**	**CO_2 and CO_2 Equivalents**
Passenger cars	4.045	1.377	0.274	0.009	0.009	0.002	152
Passenger truck	1.735	2.594	0.556	0.013	0.012	0.003	209
Light commercial truck	0.142	0.068	0.095	0.005	0.006	0.000	19
Short-haul truck	0.310	0.289	0.774	0.034	0.040	0.001	118
Long-haul truck	0.053	0.076	0.313	0.013	0.015	0.000	43
Total	**6.285**	**4.404**	**2.012**	**0.075**	**0.082**	**0.007**	**542**

Key:

Short-haul trucks category includes trucks such as dump trucks and cement trucks.
Long-haul trucks category includes trucks such as semi-trailers (18-wheelers).

1. Emission factors were generated by the USEPA preferred model MOVES2010a. MOVES simulates daily motor vehicle operations and produces emission rates. MOVES emission rates include sources from engine combustion, tire wear, brake wear, evaporative fuel permiation, vapor venting and leaking (running and parking), and crankcase loss. Emission rates are daily averages for each of the criteria pollutants. The averages are from a combination of vehicle operations such as stop and go, highway travel, acceleration at on-ramps, parking, start-up, extended idle, etc.

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS- ONGOING OPERATIONS

MOVES 2010a					
Source	**Fuel type**	**Number of vehicles**	**Miles traveled per day**	**Days of travel per year**	**Miles traveled per year**
Passenger cars	Gasoline	64	60	240	921,600
Passenger truck	Gasoline	64	60	240	921,600
Light commercial truck	Diesel	2	60	240	28,800
Short-haul truck	Diesel	2	60	240	28,800
Long-haul truck	Diesel	2	60	240	28,800

Emission Factors (MOVES 2010a Emission Rates)[1]							
Source	**VOC (g/mile)**	**CO (g/mile)**	**NOx (g/mile)**	**PM-10 (g/mile)**	**PM-2.5 (g/mile)**	**SO_2 (g/mile)**	**CO_2 and CO_2 Equivalents (g/mile)**
Passenger cars	8.497	2.892	0.576	0.019	0.018	0.005	320
Passenger truck	3.645	5.449	1.168	0.027	0.025	0.007	439
Light commercial truck	4.460	2.158	2.986	0.164	0.190	0.005	609
Short-haul truck	2.438	2.273	6.095	0.270	0.313	0.007	929
Long-haul truck	2.519	3.610	14.776	0.625	0.726	0.016	2,020

Total Emission for On-Road Commuter Activities (tons/year)							
Source	**VOC**	**CO**	**NOx**	**PM-10**	**PM-2.5**	**SO_2**	**CO_2 and CO_2 Equivalents**
Passenger cars	8.63	2.94	0.58	0.02	0.02	0.01	325
Passenger truck	3.70	5.53	1.19	0.03	0.03	0.01	446
Light commercial truck	0.14	0.07	0.09	0.01	0.01	0.00	19
Short-haul truck	0.08	0.07	0.19	0.01	0.01	0.00	29
Long-haul truck	0.08	0.11	0.47	0.02	0.02	0.00	64
Total	12.63	8.73	2.53	0.08	0.08	0.01	884

Key:

Short-haul trucks category includes trucks such as dump trucks and cement trucks.

Long-haul trucks category includes trucks such as semi-trailers (18-wheelers).

1. Emission factors were generated by the USEPA preferred model MOVES2010a. MOVES simulates daily motor vehicle operations and produces emission rates. MOVES emission rates include sources from engine combustion, tire wear, brake wear, evaporative fuel permiation, vapor venting and leaking (running and parking), and crankcase loss. Emission rates are daily averages for each of the criteria pollutants. The averages are from a combination of vehicle operations such as stop and go, highway travel, acceleration at on-ramps, parking, start-up, extended idle, etc.

CALCULATION SHEET-FUGITIVE DUST-CONSTRUCTION

Assumptions for Combustion Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006

PM-2.5 Emissions

PM-2.5 Multiplier	0.10	(10% of PM-10 emissions assumed to be PM-2.5)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM-10 and PM-2.5 emissions)	EPA 2001; EPA 2006

Project Assumptions

Construction Area (0.19 ton PM-10/acre-month)

			Conversion Factors	
Duration of Soil Disturbance in Project	12	months	0.000022957	acres per feet
Length	0	miles	5280	feet per mile
Length (converted)	0	feet		
Width	0	feet		
Area	40.00	acres*		

*Assume that only 40 acres of the total 117 acres of land would be disturbed on any given day.

Staging Areas

Duration of Construction Project	6	months
Length		miles
Length (converted)		feet
Width		feet
Area	2.00	acres

	Project Emissions (tons/year)			
	PM-10 uncontrolled	**PM-10 controlled**	**PM-2.5 uncontrolled**	**PM-2.5 controlled**
Construction Areas	91.20	45.60	9.12	4.56
Staging Areas	0.38	0.19	0.04	0.02
Total	**91.58**	**45.79**	**9.16**	**4.58**

References:

USEPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

USEPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Assumptions for Fugitive Emissions

General Construction Activities Emission Factor

0.19 ton PM-10/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM-10/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM-10/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions from Construction Operations, calculated the 0.19 ton PM-10/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM-10/acre-month) and 75% of the average emission factor (0.11 ton PM-10/acre-month).

The 0.19 ton PM-10/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM-10/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particle (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District and the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM-10 and PM-2.5 in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM-10/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM-10/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM-10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

PM-2.5 Multiplier **0.10**

PM-2.5 emissions are estimated by applying a particle size multiplier of 0.10 to PM-10 emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM-10 and PM-2.5 **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM-10 and PM-2.5 in PM nonattainment areas. Wetting controls will be applied during project construction (EPA 2006).

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Emissions Inventory Summary

(Short Tons per Year)

Baseline - El Paso Intl 2012

Category	CO2	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Aircraft	123.711	3.904	1.175	1.358	1.351	1.358	0.147	0.051	N/A	N/A
GSE	N/A	0.979	N/A	0.228	0.244	0.248	2.976	0.008	0.184	0.179
APUs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Parking Facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roadways	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Stationary Sources	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Training Fires	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grand Total	123.711	4.883	1.175	1.586	1.595	1.606	3.123	0.059	0.184	0.179

GSE = Ground Support Equipment such as aircraft tug, mobile generator, fuel truck, etc.

CALCULATION SHEET-SUMMARY OF EMISSIONS

Summary of Emissions (tons/year)									
Emission Source	VOC	CO	NOx	PM-10	PM-2.5	SO_2	CO_2	CO_2 Equivalents	Total CO_2
Combustion Emissions	1.91	7.68	17.53	1.53	1.49	2.23	1617.89	5,498	7,116
Construction Site-Fugitive PM-10	NA	NA	NA	45.79	4.58	NA	NA	NA	NA
Construction Workers Commuter & Trucking	6.28	4.40	2.01	0.07	0.08	0.01	NA	542	542
Total Emissions-CONSTRUCTION	**8.19**	**12.09**	**19.54**	**47.40**	**6.15**	**2.24**	**1618**	**6,040**	**7,657**
Operational Emissions - commuters	12.63	8.73	2.53	0.08	0.08	0.01	NA	884	884
Aircraft Emissions	1.60	4.88	3.12	0.18	0.18	0.06	123.71	NA	124
Total Operational Emissions	**14.22**	**13.61**	**5.65**	**0.26**	**0.26**	**0.07**	**123.71**	**884.20**	**1007.91**
De minimis Threshold (1)	100	100	100	70	100	100	NA	NA	25,000

1. Note that Dona Ana is a moderate non-attainment area for PM-10 (USEPA 2011b).

Carbon Equivalents	Conversion Factor
N_2O or NOx	311
Methane or VOCs	25

Source: EPA 2010 Reference, Tables and Conversions, Inventory of U.S. Greenhouse Gas Emissions and Sinks; http://www.epa.gov/climatechange/emissions/usinventoryreport.html

APPENDIX C
COA FOR UAS OPERATIONS ON FORT BLISS

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Department of the Army

IMWE-BLS-PLA-ATA
Bldg 9600 South IFC Road
Ft Bliss, TX 79916

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Operation of the Shadow Unmanned Aircraft System (UAS) in Class E and G airspace to/from McGregor Davis Dome Airstrip and R5103B and between R5103B/C and R5107K at or below 7,000' Mean Sea Level under the jurisdiction of Cherokee Control and Biggs Army Air Field Tower.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate 2012-CSA-53 is effective from August 16, 2012 to April 15, 2013 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative. If an updated Spectrum and Airworthiness Statement is received prior to expiration, this COA will be extended to August 15, 2014.

BY DIRECTION OF THE ADMINISTRATOR

FAA Headquarters, AJV-115
(Region)

M. Randy Willis
(Signature)

August 15, 2012
(Date)

Air Traffic Manager, UAS Integration Office
(Title)

FAA Form 7711-1 (7-74)

COA Number: 2012-CSA-53

Issued To: Department of the Army, referred herein as the "proponent"

Address: IMWE-BLS-PLA-ATA
Bldg 9600 South IFC Road
Ft Bliss, TX 79916

Activity: Operation of the Shadow Unmanned Aircraft System (UAS) in Class E and G airspace to/from McGregor Davis Dome Airstrip and R5103B and between R5103B/C and R5107K at or below 7,000' Mean Sea Level under the jurisdiction of Cherokee Control and Biggs Army Air Field Tower.

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of training flights.

Dates of Use: This COA is valid from August 16, 2012 through April 15, 2013. If an updated Spectrum and Airworthiness Statement is received prior to expiration, this COA will be extended to August 15, 2014. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 business days prior to the requested effective date.

Public Aircraft

1. A public aircraft operation is determined by statute, 49 USC §40102(a)(41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statute.
3. All flights must be conducted per the declarations submitted on COA on-line.

STANDARD PROVISIONS

A. **General.**

The review of this activity is based upon current understanding of UAS operations and their impact in the NAS. This COA will not be considered a precedent for future operations. (As changes in or understanding of the UAS industry occur, limitations and conditions for operations will be adjusted.)

All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.

A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are being conducted.

This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive written notice of cancellation.

During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA. Note: This section does not pertain to agencies that have other existing agreements in place with the FAA.

B. **Airworthiness Certification.**

The unmanned aircraft must be shown to be airworthy to conduct flight operations in the NAS. The Department of the Army has made its own determination that the Shadow unmanned aircraft is airworthy. The Shadow must be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in the COA application.

1. A configuration control program must be in place for hardware and/or software changes made to the UAS to ensure continued airworthiness. If a new or revised Airworthiness Release is generated as a result of changes in the hardware or software affecting the operating characteristics of the UAS, notify the UAS Integration Office of the changes as soon as practical.

a. Software and hardware changes should be documented as part of the normal maintenance procedures. Software changes to the aircraft and control station as well as hardware system changes are classified as major changes unless the agency has a formal process, accepted by the FAA. These changes should be provided to the UAS Integration office in summary form at the time of incorporation.

b. Major modifications or changes, performed under the COA, or other authorizations that could potentially affect the safe operation of the system must be documented and provided to the FAA in the form of a new AWR, unless the agency has a formal process, accepted by the FAA.

c. All previously flight proven systems to include payloads, may be installed or removed as required, and that activity recorded in the unmanned aircraft and ground control stations logbooks by persons authorized to conduct UAS maintenance Describe any payload equipment configurations in the UAS logbook that will result in a weight and balance change, electrical loads, and or flight dynamics, unless the agency has a formal process, accepted by the FAA.

d. For unmanned aircraft system discrepancies, a record entry should be made by an appropriately rated person to document the finding in the logbook. No flights may be conducted following major changes, modifications or new installations unless the party responsible for certifying airworthiness has determined the system is safe to operate in the NAS and a new AWR is generated, unless the agency has a formal process, accepted by the FAA. The successful completion of these tests must be recorded in the appropriate logbook, unless the agency has a formal process, accepted by the FAA.

2. The Shadow must be operated in strict compliance with all provisions and conditions contained within the spectrum analysis assigned and authorized for use within the defined operations area.

3. All items contained in the application for equipment frequency allocation must be adhered to, including the assigned frequencies and antenna equipment characteristics. A ground operational check to verify the control station can communicate with the aircraft (frequency integration check) must be conducted prior to the launch of the unmanned aircraft to ensure any electromagnetic interference does not adversely affect control of the aircraft.

4. The use of a Traffic Collision Avoidance System (TCAS) in any mode while operating an unmanned aircraft is prohibited.

C. **Operations.**

1. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
   a. In any defined operating area,

b. From a single control station, and
c. By one pilot at a time.

2. A Pilot-in-Command (PIC) is the person who has final authority and responsibility for the operation and safety of flight, has been designated as PIC before or during the flight, and holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight. The responsibility and authority of the PIC as described by 14 CFR 91.3, Responsibility and Authority of the Pilot-in-Command, apply to the unmanned aircraft PIC. The PIC position may rotate duties as necessary with equally qualified pilots. The individual designated as PIC may change during flight. **Note:** The PIC can only be the PIC for one aircraft at a time. For Optionally Piloted Aircraft (OPA), PIC must meet UAS guidance requirements for training, pilot licensing, and medical requirements when operating OPA as a UAS.

3. The PIC must conduct a pre-takeoff briefing as applicable prior to each launch. The briefing should include but is not limited to the
   a. Contents of the COA,
   b. Altitudes to be flown,
   c. Mission overview including handoff procedures,
   d. Frequencies to be used,
   e. Flight time, including reserve fuel requirements,
   f. Contingency procedures to include lost link, divert, and flight termination, and
   g. Hazards unique to the flight being flown.

Note: Flight Crew Member (UAS). In addition to the flight crew members identified in 14 CFR Part 1, Definitions and Abbreviations, an Unmanned Aircraft System flight crew members include pilots, sensor/payload operators, and visual observers and may include other persons as appropriate or required to ensure safe operation of the aircraft.

4. All operations will be conducted in compliance with Title 14 CFR Part 91. Special attention should be given to:
   a. § 91.3 Responsibility and authority of the pilot in command
   b. § 91.13 Careless or reckless operation
   c. § 91.17 Alcohol or drugs
   d. § 91.103 Preflight Actions
   e. § 91.111 Operating near other aircraft.
   f. § 91.113 Right-of-way rules: Except water operations
   g. § 91.115 Right-of-way rules: Water operations
   h. § 91.119 Minimum safe altitudes: General
   i. § 91.123 Compliance with ATC clearances and instructions.

j. § 91.133 Restricted and prohibited areas

k. § 91.137 Temporary flight restrictions in the vicinity of disaster/hazard areas

l. § 91.145 Management of aircraft operations in the vicinity of aerial demonstrations and major sporting events

m. § 91.151 Fuel requirements for flight in VFR conditions

n. § 91.155 Basic VFR weather minimums

o. § 91.159 VFR cruising altitude or flight level

p. § 91.209 Aircraft Lights

q. § 91.213 Inoperative instruments and equipment

r. § 91.215 ATC transponder and altitude reporting equipment and use

s. Appendix D to Part 91—Airports/Locations: Special Operating Restrictions

5. Unless otherwise authorized as a special provision, all operations must be conducted in visual meteorological conditions (VMC) during daylight hours in compliance with Title 14 of the Code of Federal Regulations (CFR) Part 91 §91.155 and the following:

6. Special Visual Flight Rules (VFR) operations are not authorized.

   a. VFR cloud clearances specified in 14 CFR Part 91 §91.155, must be maintained, except in Class G airspace where Class E airspace visibility requirements must be applied, but not less than 3 statute miles (SM) flight visibility and 1000’ ceiling.

   b. Flights conducted under Instrument Flight Rules (IFR) in Class A airspace shall remain clear of clouds. NOTE: Deviations from IFR clearance necessary to comply with this provision must have prior ATC approval.

   c. Chase aircraft must maintain 5 NM flight visibility.

7. Night operations are prohibited unless otherwise authorized as a special provision.

8. Operations (including lost link procedures) must not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.

D. **Air Traffic Control (ATC) Communications.**

1. The pilot and/or PIC will maintain direct, two-way communication with ATC and have the ability to maneuver the unmanned aircraft in response to ATC instructions, unless addressed in the Special Provision Section.

   a. When required, ATC will assign a radio frequency for air traffic control during flight. The use of land-line and/or cellular telephones is prohibited as the primary means for in-flight communication with ATC.

2. The PIC must not accept an ATC clearance requiring the use of visual separation, sequencing, or visual approach.

3. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft must not loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.

4. For flights operating on an IFR clearance at or above 18,000 feet mean sea level (MSL), the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDs, and/or waypoints is provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.

5. If equipped, the unmanned aircraft must operate with
   a. An operational mode 3/A transponder with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk
   b. Position/navigation and anti-collision lights on at all times during flight unless stipulated in the special provisions or the proponent has a specific exemption from 14 CFR Part 91.209.

6. Operations that use a Global Positioning System (GPS) for navigation must check Receiver Autonomous Integrity Monitoring (RAIM) notices prior to flight operations. Flight into a GPS test area or degraded RAIM is prohibited for those aircraft that use GPS as their sole means for navigation.

E. **Safety of Flight.**

1. The proponent or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.

2. ATC must be immediately notified in the event of any emergency, loss and subsequent restoration of command link, loss of PIC or observer visual contact, or any other malfunction or occurrence that would impact safety or operations.

3. Sterile Cockpit Procedures.
   a. Critical phases of flight include all ground operations involving
      (1) Taxi (movement of an aircraft under its own power on the surface of an airport)
      (2) Take-off and landing (launch or recovery)
      (3) All other flight operations in which safety or mission accomplishment might be compromised by distractions
   b. No crewmember may perform any duties during a critical phase of flight not required for the safe operation of the aircraft.

c. No crewmember may engage in, nor may any PIC permit, any activity during a critical phase of flight which could

(1) Distract any crewmember from the performance of his/her duties or

(2) Interfere in any way with the proper conduct of those duties.

d. The pilot and/or the PIC must not engage in any activity not directly related to the operation of the aircraft. Activities include, but are not limited to, operating UAS sensors or other payload systems.

e. The use of cell phones or other electronic devices is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with Air Traffic Control.

4. See-and-Avoid.
Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations. Adherence to 14 CFR Part 91 §91.111, §91.113 and §91.115, is required.

a. The proponent and/or delegated representatives are responsible at all times for collision avoidance with all aviation activities and the safety of persons or property on the surface with respect to the UAS.

b. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft at all times.

c. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the PIC.

d. UA operations will only be conducted within Reduced Vertical Separation Minimum (RVSM) altitudes, when appropriately equipped or having received a clearance under an FAA deviation. **NOTE:** UA operations should not plan on an en-route clearance in RVSM altitudes, without being RVSM equipped.

e. Visual observers must be used at all times except in Class A, airspace, active Restricted Areas, and Warning areas designated for aviation activities.

(1) Observers may either be ground-based or in a chase plane.

(2) If the chase aircraft is operating more than 100 feet above/below and/or more than ½ NM laterally of the unmanned aircraft, the chase aircraft PIC will advise the controlling ATC facility.

f. The PIC is responsible to ensure visual observers are;

(1) Able to see the aircraft and the surrounding airspace throughout the entire flight, and

(2) Able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:

(a) Comply with CFR Parts 91.111, 91.113 and 91.115, and

(b) Prevent the UA from creating a collision hazard.

5. Observers must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.

6. A PIC may rotate duties as necessary to fulfill operational requirements; a PIC must be designated at all times.

7. Pilots flying chase aircraft must not concurrently perform observer or UA pilot duties.

8. Pilot and observers must not assume concurrent duties as both pilot and observer.

9. The required number of ground observers will be in place during flight operations.

10. The use of multiple successive observers (daisy chaining) is prohibited unless otherwise authorized as a special provision.

11. The dropping or spraying of aircraft stores, or carrying of hazardous materials (including ordnance) outside of active Restricted, Prohibited, or Warning Areas approved for aviation activities is prohibited unless specifically authorized as a special provision.

F. **Crewmember Requirements.**

1. All crewmembers associated with the operation of the unmanned aircraft, including chase operations, must be qualified or must be receiving formal training under the direct supervision of a qualified instructor, who has at all times, responsibility for the operation of the unmanned aircraft.

2. Pilots and observers must have an understanding of, and comply with, Title 14 Code of Federal Regulations, and/or agency directives and regulations, applicable to the airspace where the unmanned aircraft will operate.

3. Pilots, supplemental pilots, and observers must maintain a current second class (or higher) airman medical certificate that has been issued under 14 CFR Part 67, or an FAA accepted agency equivalent based on the application.

4. At a minimum, the use of alcohol and/or drugs in violation of 14 CFR Part 91 §91.17 applies to UA pilots and observers.

5. At a minimum, observers must receive training on rules and responsibilities described in 14 CFR Part 91 §91.111. §91.113 and §91.115, regarding cloud clearance, flight visibility, and the pilot controller glossary, including standard ATC phraseology and communication.

6. Recent Pilot Experience (Currency). The proponent must provide documentation, upon request, showing the pilot/supplemental pilot/PIC maintains an appropriate level of recent pilot experience in either the UAS being operated or in a certified simulator. At a minimum, he/she must conduct three takeoffs (launch) and three landings (recovery) in the specific UAS within the previous 90 days (excluding pilots who do not conduct launch/recovery during normal/emergency operations). If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating requirements.

7. A PIC and/or supplemental pilot have the ability to assume the duties of an internal or an external UAS pilot at any point during the flight.

8. A PIC may be augmented by supplemental pilots.

9. PIC Ratings.
   Rating requirements for the UAS PIC depend on the type of operation conducted. The requirement for the PIC to hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application of 14 CFR Part 61, is predicated on various factors including the location of the planned operations, mission profile, size of the unmanned aircraft, and whether or not the operation is conducted within or beyond visual line-of-sight.

   a. The PIC must hold, at a minimum, a current FAA private pilot certificate or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61.under all operations:

      (1) Approved for flight in Class A, B, C, D, E, and G (more than 400 feet above ground level (AGL)) airspace

      (2) Conducted under IFR (FAA instrument rating required, or the FAA accepted agency equivalent, based on the application or 14 CFR Part 61

      (3) Approved for night operations

      (4) Conducted at or within 5 NM of a joint use or public airfields

      (5) Requiring a chase aircraft

      (6) At any time the FAA has determined the need based on the UAS characteristics, mission profile, or other operational parameters

   b. Operations without a pilot certificate may be allowed when all of the following conditions are met:

      (1) The PIC has successfully completed, at a minimum, FAA private pilot ground instruction and passed the written examination, or the FAA accepted agency equivalent, based on the application. Airman Test reports are valid for the 24-

calendar month period preceding the month the exam was completed, at which time the instruction and written examination must be repeated.

(2) Operations are during daylight hours.

(3) The operation is conducted in a sparsely populated location.

(4) The operation is conducted from a privately owned airfield, military installation, or off-airport location.

(5) Operations are approved and conducted solely within visual line-of-sight in Class G airspace.

(6) Visual line-of-sight operations are conducted at an altitude of no more than 400 feet Above Ground Level (AGL) in class G airspace at all times.

c. The FAA may require specific aircraft category and class ratings in manned aircraft depending on the UAS seeking approval and the characteristics of its flight controls interface.

10. PIC Recent Flight Experience (Currency).

a. For those operations that require a certificated pilot or FAA accepted agency equivalent, based on the application, the PIC must have flight reviews 14 CFR Part 61.56, and if the pilot conducts takeoff, launch, landing or recovery the PIC must maintain recent pilot experience in manned aircraft per 14 CFR Part 61.57,; Recent Flight Experience: Pilot in Command. .

b. For operations approved for night or IFR through special provisions, the PIC must maintain minimum recent pilot experience per 14 CFR Part 61.57, Recent Flight Experience: Pilot in Command, as applicable.

11. Supplemental Pilot Ratings.

a. Supplemental pilots must have, at a minimum, successfully completed private pilot ground school and passed the written test or the FAA accepted agency equivalent, based on the application. The ground school written test results are valid for two years from the date of completion, at which time the instruction and written examination must be repeated. If a supplemental pilot assumes the role of PIC, he/she must comply with PIC rating, currency, medical, and training requirements listed in this document.

12. Ancillary personnel such as systems operators or mission specialists must be thoroughly familiar with and possess operational experience of the equipment being used. If the systems being used are for observation and detection of other aircraft for collision avoidance purposes, personnel must be thoroughly trained on collision avoidance procedures and techniques and have direct communication with the UAS pilot, observer, and other crewmembers.

13. The Agency will ensure that Crew Resource Management (CRM) training is current for all crew members before flying operational or training missions. The CRM program

must consist of initial training, as well as CRM recurrent training during every recurrent training cycle, not to exceed a 12 month interval between initial training and recurrent training or between subsequent recurrent training sessions.

G. **Notice to Airmen (NOTAM).**

1. A distance (D) NOTAM must be issued when unmanned aircraft operations are being conducted. This requirement may be accomplished
   a. Through the proponent's local base operations or NOTAM issuing authority, or
   b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation, unless otherwise authorized as a special provision. The issuing agency will require the:
      (1) Name and address of the pilot filing the NOTAM request
      (2) Location, altitude, or operating area
      (3) Time and nature of the activity.

2. For proponents filing their NOTAM with the Department of Defense: The requirement to file with an Automated Flight Service Station (AFSS) is in addition to any local procedures/requirements for filing through the Defense Internet NOTAM Service (DINS).

H. **Data Reporting.**

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. This requirement includes COA operations within Special Use airspace. NOTE: Negative (zero flights) reports are required.

2. The proponent must submit the following information through UAS COA On-Line on a monthly basis:
   a. The number of flights conducted under this COA. (A flight during which any portion is conducted in the NAS must be counted only once, regardless of how many times it may enter and leave Special Use airspace between takeoff and landing)
   b. Aircraft operational hours per flight
   c. Ground control station operational hours in support of each flight, to include Launch and Recovery Element (LRE) operations
   d. Pilot duty time per flight
   e. Equipment malfunctions (hardware/software) affecting either the aircraft or ground control station
   f. Deviations from ATC instructions and/or Letters of Agreement/Procedures
   g. Operational/coordination issues

h. The number and duration of lost link events (control, vehicle performance and health monitoring, or communications) per aircraft per flight.

I. **Incident/Accident/Mishap Reporting.**

Immediately after an incident or accident, and before additional flight under this COA, the proponent must provide initial notification of the following to the FAA via the UAS COA On-Line forms (Incident/Accident).

1. All accidents/mishaps involving UAS operations where any of the following occurs:
   a. Fatal injury, where the operation of a UAS results in a death occurring within 30 days of the accident/mishap
   b. Serious injury, where the operation of a UAS results in a hospitalization of more than 48 hours, the fracture of any bone (except for simple fractures of fingers, toes, or nose), severe hemorrhage or tissue damage, internal injuries, or second or third-degree burns
   c. Total unmanned aircraft loss
   d. Substantial damage to the unmanned aircraft system where there is damage to the airframe, power plant, or onboard systems that must be repaired prior to further flight
   e. Damage to property, other than the unmanned aircraft.

2. Any incident/mishap that results in an unsafe/abnormal operation including but not limited to
   a. A malfunction or failure of the unmanned aircraft's on-board flight control system (including navigation)
   b. A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)
   c. A power plant failure or malfunction
   d. An in-flight fire
   e. An aircraft collision
   f. Any in-flight failure of the unmanned aircraft's electrical system requiring use of alternate or emergency power to complete the flight
   g. A deviation from any provision contained in the COA
   h. A deviation from an ATC clearance and/or Letter(s) of Agreement/Procedures
   i. A lost control link event resulting in
      (1) Fly-away, or
      (2) Execution of a pre-planned/unplanned lost link procedure.

3. Initial reports must contain the information identified in the COA On-Line Accident/Incident Report.

4. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations. Such reports must be limited to factual information only where privileged safety or law enforcement information is included in the final report.

5. Public-use agencies other than those which are part of the Department of Defense are advised that the above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR Part 830 §830.5.

6. This COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.

FLIGHT STANDARDS SPECIAL PROVISIONS

A. **Contingency Planning**

1. **Point Identification**. The proponent must submit contingency plans that address emergency recovery or flight termination of the unmanned aircraft (UA) in the event of unrecoverable system failure. These procedures will normally include Lost Link Points (LLP), Divert/Contingency Points (DCP) and Flight Termination Points (FTP) for each operation. LLPs and DCPs must be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart (or similar format). FTPs or other accepted contingency planning measures must also be submitted in latitude/longitude (Lat/Long) format along with a graphic representation plotted on an aviation sectional chart, or other graphic representation acceptable to the FAA. The FAA accepts the LLPs, DCPs, FTPs, and other contingency planning measures, submitted by the proponent but does not approve them. When conditions preclude the use of FTPs, the proponent must submit other contingency planning options for consideration and approval. At least one LLP, DCP, and FTP (or an acceptable alternative contingency planning measure) is required for each operation. The proponent must furnish this data with the initial COA application. Any subsequent changes or modifications to this data must be provided to AJV-13 for review and consideration no later than 30 days prior to proposed flight operations.

2. **Risk Mitigation Plans**. For all operations, the proponent must develop detailed plans to mitigate the risk of collision with other aircraft and the risk posed to persons and property on the ground in the event the UAS encounters a lost link, needs to divert, or the flight needs to be terminated. The proponent must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDs, and congested areas. In the event of a contingency divert or flight termination, the use of a chase aircraft is preferred when the UAS is operated

outside of Restricted or Warning Areas. If time permits, the proponent should make every attempt to utilize a chase aircraft to monitor the aircraft to a DCP or to the FTP. In the event of a contingency divert or flight termination, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

a. **LLP Procedures**.

(1) LLPs are defined as a point, or sequence of points where the aircraft will proceed and hold at a specified altitude, for a specified period of time, in the event the command and control link to the aircraft is lost. The aircraft will autonomously hold, or loiter, at the LLP until the communication link with the aircraft is restored or the specified time elapses. If the time period elapses, the aircraft may autoland, proceed to another LLP in an attempt to regain the communication link, or proceed to an FTP for flight termination. LLPs may be used as FTPs. In this case, the aircraft may loiter at the LLP/FTP until link is re-established or fuel exhaustion occurs.

(2) For areas where multiple or concurrent UAS operations are authorized in the same operational area, a segregation plan must be in place in the event of a simultaneous lost link scenario. The segregation plan may include altitude offsets and horizontal separation by using independent LLPs whenever possible.

b. **DCP Procedures**.

(1) A DCP is defined as an alternate landing/recovery site to be used in the event of an abnormal condition that requires a precautionary landing. Each DCP must incorporate the means of communication with ATC throughout the descent and landing (unless otherwise specified in the Special Provisions) as well as a plan for ground operations and securing/parking the aircraft on the ground. This includes the availability of ground control stations capable of launch/recovery, communication equipment, and an adequate power source to operate all required equipment.

(2) For local operations, the DCP specified will normally be the airport/facility used for launch and recovery; however, the proponent may specify additional DCPs as alternates.

(3) For transit and/or mission operations that are being conducted in Class A airspace or Class E airspace above flight level (FL)-600, DCPs will be identified during the flight to be no further than one hour of flight time at any given time, taking into consideration altitude, winds, fuel consumption, and other factors. If it is not possible to define DCPs along the entire flight plan route, the proponent must identify qualified FTPs along the entire route and be prepared to execute flight termination at one of the specified FTPs if a return to base (RTB) is not possible.

(4) It is preferred that specified DCPs are non-joint use military airfields, other government-owned airfields, or private-use airfields. However, the proponent may designate any suitable airfield for review and consideration.

c. **Flight Termination Procedures**.

(1) Flight termination is the intentional and deliberate process of performing controlled flight into terrain (CFIT). Flight termination must be executed in the event that all contingencies have been exhausted and further flight of the aircraft cannot be safely achieved or other potential hazards exist that require immediate discontinuation of flight. FTPs or alternative contingency planning measures must be located within power off glide distance of the aircraft during all phases of flight and must be submitted for review and acceptance. The proponent must ensure sufficient FTPs or other contingency plan measures are defined to accommodate flight termination at any given point along the route of flight. The location of these points is based on the assumption of an unrecoverable system failure and must take into consideration altitude, winds, and other factors.

(2) Unless otherwise authorized, FTPs must be located in sparsely populated areas. Except for on- or near-airport operations, FTPs will be located no closer than five nautical miles from any airport, heliport, airfield, NAVAID, airway, populated area, major roadway, oil rig, power plant, or any other infrastructure. For offshore locations, the proponent must refer to appropriate United States Coast Guard (USCG) charts and other publications to avoid maritime obstructions, shipping lanes, and other hazards. Populated areas are defined as those areas depicted in yellow on a VFR sectional chart or as determined from other sources.

(a) It is preferred that flight termination occurs in Restricted or Warning Areas, government-owned land, or offshore locations that are restricted from routine civil use. However, the proponent may designate any suitable location for review and consideration.

(b) The proponent is required to survey all designated areas prior to their use as an FTP. All FTPs will be reviewed for suitability on a routine and periodic basis, not to exceed six months. The proponent assumes full risk and all liability associated with the selection and use of any designated FTP.

(c) It is desirable that the proponent receive prior permission from the land owner or using agency prior to the use of this area as an FTP. The proponent should clearly communicate the purpose and intent of the FTP.

(d) For each FTP, plans must incorporate the means of communication with ATC throughout the descent as well as a plan for retrieval/recovery of the aircraft.

(e) Contingency planning must take into consideration all airspace constructs and minimize risk to other aircraft by avoiding published airways, military training routes, NAVAIDs, and congested areas to the maximum extent possible.

(f) In the event of a contingency divert or flight termination, if time permits, the use of a chase aircraft is preferred when the UA is operated outside of Restricted or Warning Areas.

(g) In the event of a contingency divert or flight termination or other approved contingency measures, the proponent will operate in Class A airspace and Special Use airspace to the maximum extent possible to reduce the risk of collision with non-participating air traffic.

B. **Night Operation Limitations.**

Night operations are authorized. The following measures are considered adequate to ensure an acceptable level of safety for UAS night operations.

UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (Note: this is equal to approximately 30 minutes after sunset until 30 minutes before sunrise).

1. For Class D - UAS launch and recovery operations will take place wholly within Class D airspace while the ATC tower is open and the Class D active.
2. For Class D - The mixing of civil manned and unmanned traffic within Class D airspace during launch and recovery operations is prohibited.
3. All classes of airspace - External pilots and UAS ground observer(s) must be in place 30 minutes prior to night operations to ensure dark adaptation.
4. All classes of airspace - Ground observers will undergo additional training on the lighting configuration of the UAS to ensure proper recognition during flight at night.
5. For Class D - In addition to the ground observers, ATCT will monitor the Tower Display Monitor (TDM) display, if available, as a supplement to ensure no traffic is approaching the controlled airspace without making the required radio contact. Additionally, information from the Tower Display Monitor will be used to help reduce possible night time optical illusions. If the TDM is not operational, night operations will not be authorized.

C. **Lost-link procedures will adhere to those procedures provided in the COA application. Shortly before using a cross over corridor, the PIC must confirm with another crewmember that the proper lost link point is correctly entered into the command logic of the UA for the corridor and restricted area to be used. If lost link occurs while transitioning between R5103C and R5107K, the UA will maintain its current altitude while proceeding to the appropriate restricted area.**

D. **To clarify terms stated in the Visual Observers attachment provided in the COA application, the Mission Commander (MC) is not the same as the Pilot in Command (PIC). The PIC must be in direct communications with Air Traffic Control and the observers. Any traffic alerts, communications problems, lost sight of UA, or similar instances affecting the UA flight, must be directed to the PIC, not the MC, for appropriate action. MC may act as the PIC if the MC is qualified and has immediate access to UA controls.**

E. **If communications are lost between the observer(s) and the PIC, lost link procedures must be executed, as referenced in the COA application, until observer-PIC communications are restored. If for any reason communications between the PIC and observers are lost, the UA will not enter a cross over corridor and remain within the**

restricted area until communication are re-established. Similarly, if PIC and observer communications are lost in the traffic pattern the UA will remain with R5103 or land immediately until communications are re-established.

F. **If the observer(s) loses sight of the UA, lost link procedures must be executed, as referenced in the COA application, until visual contact is regained. The observer will notify the Pilot in Command (PIC) of the loss of sight. The PIC then will take appropriate action and notify ATC if required. The use of vision enhancing devices such as binoculars, night vision goggles and the like will not be used as the primary means of performing observation duties. The UA onboard sensors will not be used as a means of providing observation duties.**

G. **Daisy chaining is permissible in the north and south corridors given the procedures stated in the COA application.**

AIR TRAFFIC CONTROL SPECIAL PROVISIONS

A. **Coordination Requirements.**

PIC will send flight schedule to ZAB ARTCC 24 hours prior to flight.

B. **Communication Requirements.**

Air Traffic Control Special provisions A and C will be used in lieu of maintaining direct two-way Communications with Albuquerque Air Route Traffic Control Center.

C. **Emergency/Contingency Procedures.**

Lost Link Procedures:

In the event of a lost link, the UAS pilot will immediately notify Albuquerque Air Route Traffic Control Center, Manager at 505-856-4500, state pilot intentions, and comply with the following provisions:

See attachment 2.

UAS must remain at or below 7,000’ MSL until established in the Restricted area.

If lost link occurs within a restricted or warning area, or the lost link procedure above takes the UA into the restricted or warning area – the aircraft will not exit the restricted or warning areas until the link is re-established.

The unmanned aircraft lost link mission will not transit or orbit over populated areas.

Lost link programmed procedures will avoid unexpected turn-around and/or altitude changes and will provide sufficient time to communicate and coordinate with ATC.

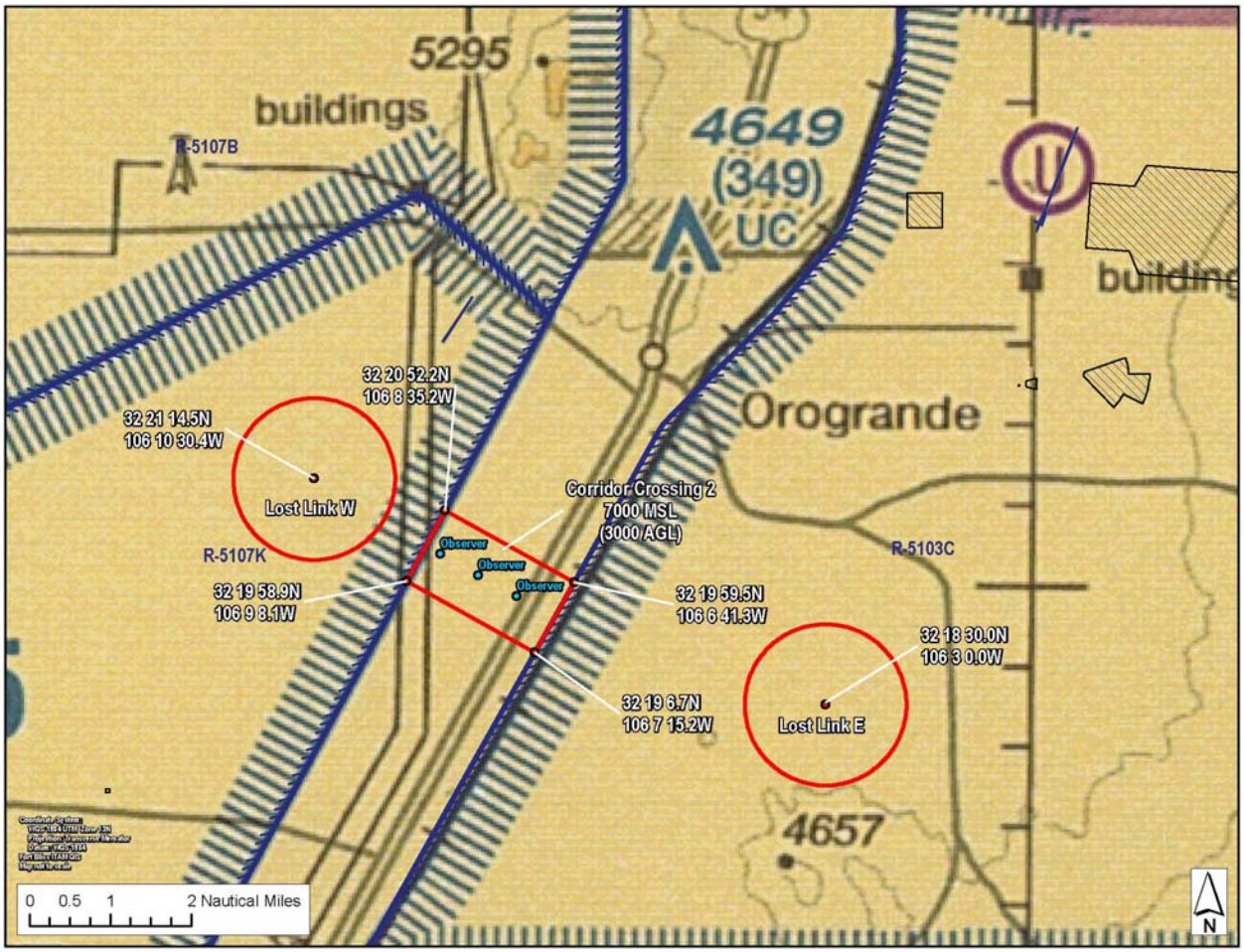
Lost link orbit points shall not coincide with the centerline of Victor airways.

AUTHORIZATION

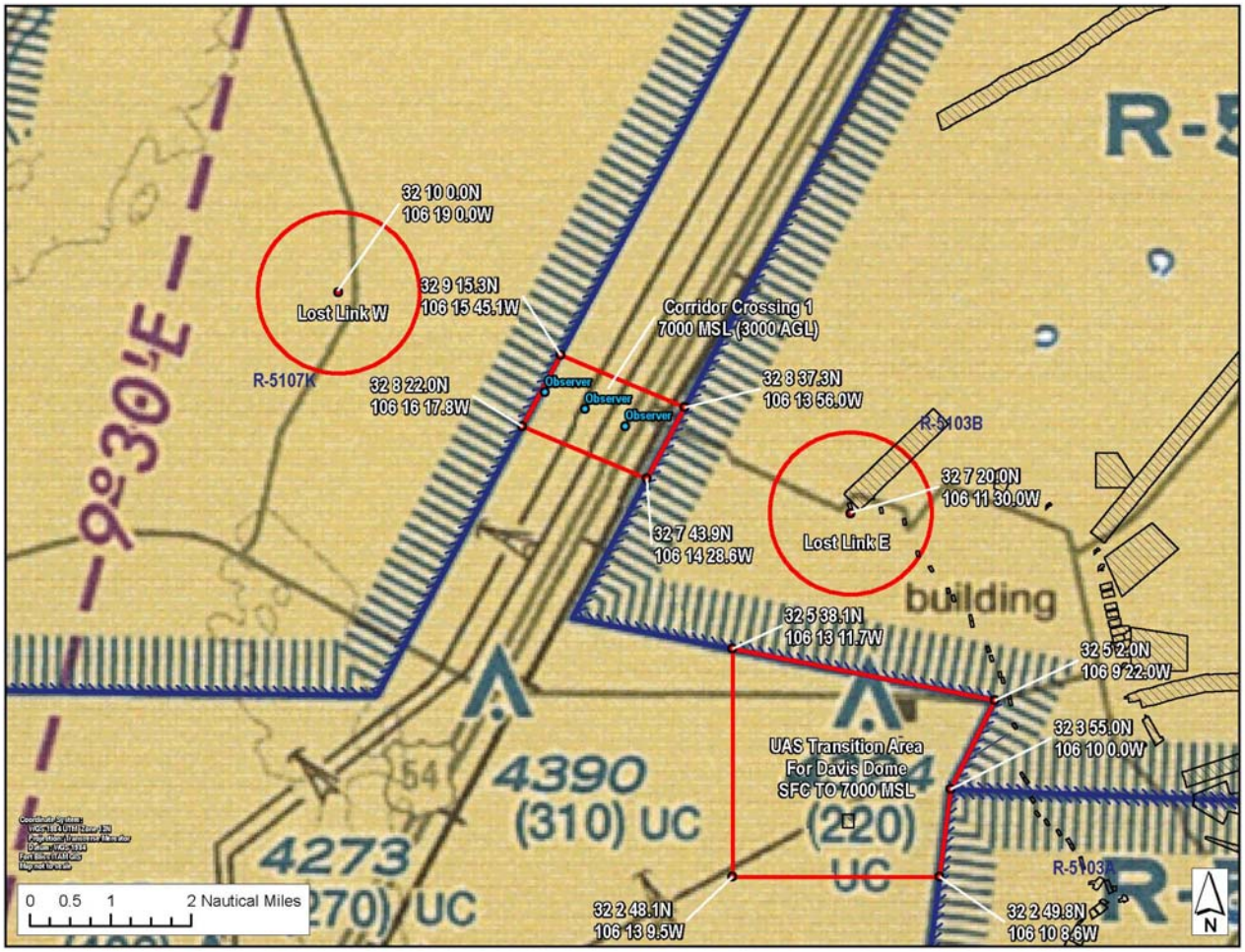
This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the Department of the Army to resolve the matter. This COA does not authorize flight within Special Use airspace without approval from the using agency. The Department of the Army is hereby authorized to operate the Shadow Unmanned Aircraft System in the operations area depicted in the Activity section of this attachment.

Attachment 1

North Crossing



South Crossing



Attachment 2

Lost Link

Lost link procedures involve a preprogrammed lost link schedule for the air vehicle to navigate to and loiter around a predetermined lost link waypoints in Restricted Airspace ; R-5103 and R-5107K. There are four Lost Link Loiter Areas—two northern lost link loiter areas with one at Latitude 32 21 14.5 North, Longitude 106 10 30.4 West, in R 5107 K and one at Latitude 32 18 30.0 North, Longitude 106 3 0.0 West in R 5103 C, —two southern lost link loiter areas with one at Latitude 32 10 0.0 North, Longitude 106 19 0.0 West in R 5107K and one at Latitude 32 7 20.0 North, Longitude 106 11 30.0 West in R 5103 B. As depicted in attachment 1, if the UAS is in R-5107K, the UAS will be programmed to use the Lost Link Loiter point in R-5107K. This Lost Link procedure is the same when the UAS is in R-5103 to assure UAS does not enter the corridor while in lost link. Immediately upon lost link, the operator shall notify Fort Bliss Range Operations which will initiate a Fort Bliss level cease fire. The Shadow's flight control system will be pre-programmed to autonomously fly to this designated orbit point at a specified altitude of 7000 to 10,000 feet MSL. A direct flight route to the lost link waypoint will be utilized at a flight altitude acceptable to McGregor Range control and will be issued prior to flight release. If the re-establishment of data link is not accomplished, the air vehicle will remain in loiter until a flight termination command is autonomously executed and the parachute deployed. If lost link procedures are executed, the Mission Commander or AVO will immediately broadcast recovery intentions to McGregor Range Control. At all times the UAS Operators shall contact ATC also on the status of the UAS. The UAS Operators will maintain radio contact with ATC facility until control has been reestablished with the UAS or the flight has terminated. Upon the notification of the Lost Link issue, the range control will then notify all aircraft on their frequencies to remain clear of the UAS flight and recovery area. The UAS will not leave the Restricted Airspace when Lost Link procedure has been executed.

Contingencies in the event of lost command/control link

The ground station maintains a constant uplink with the UAV. If the uplink signal is not received for a specified length of time, the aircraft performs its lost link protocol, including returning to land at pre-designated positions that will be designated to be within R-5103 B/C or R-5107K as specified above.