3.6.3 Environmental Consequences

3.6.3.1 Proposed Action

3.6.3.1.1 Construction and Modification Activities

Implementation of the construction and facility modification activities of the Proposed Action would result in temporary impacts to topography and soil resources. Six of the proposed projects listed in **Table 2-2** would be constructed on undisturbed land, while all other proposed projects are located on previously disturbed land. Generally, impacts will be minimized by erosion control measures and structural engineering design of new buildings.

Regional Geology. The proposed construction and facility modification activities would not be substantial enough or occur deep enough to impact geological features such as those controlling stormwater infiltration to the local groundwater aquifer or the supporting bedrock. Therefore, no impacts to geology are expected from the proposed construction and facility modification activities.

Topography and Soils. The topography of the proposed project areas (total of approximately 314,200 SF) would be temporarily impacted by construction activities due to trenching for infrastructure to support the new buildings and grading needed for site preparation. The overall topography proximate to the proposed project areas is relatively flat, and any trenches created to install infrastructure would be filled and only minimal grading would be required. All modifications to existing facilities would be done on previously disturbed areas and there would be no impact to topography. Short-term impacts on soils would occur from construction-related activities largely via ground disturbance, erosion, and soil compaction for site preparation. Erosion and soil compaction would be controlled by using BMPs such as applying water to limit airborne dust in windy environments and employing soil stabilization techniques, such as re-vegetating graded areas, once site construction and/or modification activities are complete. No impacts would be expected post construction and modification activities.

The Proposed Action would disturb an area greater than 0.75-acre requiring a fugitive dust control permit from Bernalillo County to be obtained. Each permit would include site-specific measures for dust control and suppression such as watering and the use of soil stabilization agents, if necessary. Some activities under the Proposed Action may be subject to the Fugitive Dust Control Programmatic Permit (Permit No. 8091-P) held by Kirtland AFB that includes similar requirements for dust control and suppression.

Geologic Hazards. The Proposed Action is located in an area that experiences low magnitude earthquakes. No major earthquake has been recorded in the region, and no Federal, State, or local codes require use of specific construction techniques for new construction in the area as the risk of significant damage to structures is moderate. The design of new construction and facility modifications would consider geologic hazards of the region and given the history of low magnitude earthquakes and moderate risk rating provided by the USGS, no impacts are expected.

3.6.3.1.2 Operation Activities

No impacts to regional geology, topography and soils, or geologic hazards would be expected from the personnel changes or airspace operations of the Proposed Action.

3.6.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action associated with the relocation of the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.6.2** would remain unchanged. Therefore, no new impacts on geological resources would occur with implementation of the No Action Alternative.

3.7 WATER RESOURCES

3.7.1 Regulatory Setting

Water resources are natural and man-made sources of water that are available for use by, and for the benefit of, humans and the environment. Water resources relevant to Kirtland AFB's location in New Mexico include groundwater, surface water, floodplains, and wetlands.

Groundwater. Groundwater is water that exists in the saturated zone beneath the Earth's surface that collects and flows through aquifers and is used for drinking, irrigation, and industrial purposes. Groundwater typically can be described in terms of depth from the surface, aquifer, or well capacity, water quality, and recharge rates.

Surface Water. Surface water includes natural, modified, and man-made water confinement and conveyance features above groundwater that may or may not have a defined channel and discernable water flow. Stormwater is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade surface waters, such as lakes, rivers, or streams. Energy Independence Security Act Section 438 (42 USC § 17094) establishes into law stormwater design requirements for federal development projects that disturb a footprint of greater than 5,000 square feet. Under these requirements, pre-development site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow.

Floodplains. Floodplains are areas of low, level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation because of rain or melting snow. EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain and to avoid floodplains to the maximum extent possible wherever there is a practicable alternative.

Wetlands. Wetlands are considered sensitive habitats and are subject to federal regulatory authority under Sections 401 and 404 of the Clean Water Act and EO 11990, *Protection of Wetlands*. The U.S. Army Corps of Engineers defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Wetlands generally include swamps, marshes, bogs, and similar areas. Like vegetation, the affected environment for wetlands includes only those areas potentially subject to ground disturbance.

3.7.2 Affected Environment

Groundwater. Kirtland AFB is within the limits of the Rio Grande Underground Water Basin, where the average depth to groundwater is 450 to 550 feet below ground surface. The Rio Grande Basin's source of groundwater is the Santa Fe Aquifer, which has an estimated 2.3 billion acre-feet of recoverable water. The regional aquifer is used for the installation's water supply. Kirtland AFB has a water right that allows it to divert approximately 6,400 acre-feet of water, or approximately 2 billion gallons per year from the aquifer. The proposed project areas, within the

cantonment area, are located west of the Tijeras fault zone with depth to groundwater approximately 485 to 500 feet. Water is drawn from six different wells in the Albuquerque Basin Regional Aquifer within the Santa Fe Formation (Kirtland AFB, 2020b). Water is collected, chlorinated, stored, and distributed to supply the installation with potable water.

Surface Water. Surface water generally flows across the installation in a westerly direction toward the Rio Grande. The two main surface water drainage channels on Kirtland AFB are the Tijeras Arroyo and the smaller Arroyo del Coyote, which joins the Tijeras Arroyo approximately 1 mile west of the Tijeras Arroyo Golf Course (**Figure 3.7-1**). The Tijeras Arroyo, which remains dry most of the year, is the primary surface channel that drains surface water from Kirtland AFB to the Rio Grande. Nearly 95 percent of the precipitation that flows through the Tijeras Arroyo evaporates before it reaches the Rio Grande. In the developed area of the installation, stormwater drains into small culverts towards Gibson Boulevard along the installation boundary. There are also four detention ponds in the area. Stormwater in the Industrial/Laboratory areas discharges through surface runoff to three large culverts that drain toward the Tijeras Arroyo (Kirtland AFB, 2018a).

There are no natural lakes or rivers on Kirtland AFB; however, six man-made ponds have been created on the Tijeras Arroyo Golf Course.

Kirtland AFB operates under three National Pollutant Discharge Elimination System (NPDES) Permits: (1) Multi-Sector General Permit for industrial activities; (2) Municipal Separate Storm Sewer System permit for stormwater conveyances from installation development; and (3) Construction General Permit (CGP) for construction projects. CGPs contain guidelines for erosion and sedimentation control, pollution prevention, and stabilization of construction sites of 1 acre or larger. When construction projects are not subject to NPDES CGP requirements (i.e., due to the size of the project or a waiver granted), the contractor must still implement appropriate BMPs to minimize stormwater pollutants.

Floodplains. The 100-year floodplain on the installation is associated with the Arroyo del Coyote and Tijeras Arroyo (**Figure 3.7-1**). The Arroyo del Coyote and Tijeras Arroyo flood infrequently and are characterized by high peak flows, small volumes, and short durations (Kirtland AFB, 2018a).

Wetlands. Wetlands are considered "waters of the United States" if they are determined to be jurisdictional by the U.S. Army Corps of Engineers and USEPA. There are 10 wetlands supplied by at least 15 naturally occurring springs on Kirtland AFB (**Figure 3.7-1**); however, no Jurisdictional Determinations have been made concerning these water features.

Figure 3.7-1 Surface Water, Floodplains, and Wetlands at Kirtland AFB

3.7.3 Environmental Consequences

3.7.3.1 Proposed Action

Groundwater. Groundwater would not be expected to be encountered during construction and facility modification activities, due to the depth of the groundwater aquifer, as described in **Section 3.7.2**. Temporary impacts to soil would be expected during construction and demolition activities due to ground disturbances that are inherently part of grading, excavating, and other uses of heavy equipment. These soil disturbances could lead to increased surface water runoff during rainfall events and causing increased sediment transportation that could be transferred to groundwater resources. Implementation of BMPs and planning during construction and demolition activities can minimize this impact by controlling the movement of surface water runoff and ensuring no direct access to groundwater recharge points. Drainage control measures could include utilizing temporary construction of barriers such as fiber logs or silt fences and would be placed based on site-specific evaluations on an as-needed basis. The groundwater aquifer has an estimated 2.3 billion acre-feet of recoverable water and Kirtland AFB has a water right that allows it to divert approximately 6,400 acre-feet of water, or approximately 2 billion gallons per year from the aquifer. The Proposed Action is not expected to impact groundwater levels. No impacts to groundwater or groundwater quality are expected post construction or during operations of the Proposed Action.

Surface Water. Short-term impacts would be expected during construction and facility modification activities of the Proposed Action. No permanent bodies of water are located in the proposed project areas; however, during rain events flowing stormwater has the potential to transport sediment and hazardous materials to drainage ditches. As previously discussed regarding potential routes for impacting groundwater, through use of best practices and controls, such impacts can be minimized. Additionally, construction areas of at least 1 acre must adhere to specific requirements under the Kirtland AFB Construction General Permit and are subject to inspections by installation personnel to ensure compliance. Stormwater runoff during construction and modification activities at the proposed project areas would be managed under a project-specific Stormwater Pollution Prevention Plan (SWPPP).

Post construction, there would be an approximate increase of 250,500 square feet of impervious surfaces across the proposed project areas in the cantonment area. The addition of new impervious surfaces would increase the amount of surface water runoff during precipitation events and could increase the amount of pollutants transported from impervious surfaces to drainage areas and water features on base. The construction and modification of new facilities would include additional stormwater infrastructure and consider BMPs for the additional impervious surface stormwater runoff and incorporate it into the design phase to minimize impacts from increased stormwater runoff. No impacts to surface water are expected during the operational phase of the Proposed Action.

Floodplains and Wetlands. None of the proposed construction or facility modification projects associated with the Proposed Action are located within the 100-year floodplain or directly proximate to any wetland area; therefore, there is no anticipated impact.

3.7.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action associated with the relocation of the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.7.2** would remain unchanged. Therefore, no new impacts to water resources would occur with implementation of the No Action Alternative.

3.8 BIOLOGICAL RESOURCES

3.8.1 Regulatory Setting

Biological resources include native or naturalized plants and animals and the habitats in which they occur, and native or introduced species found in landscaped or disturbed areas. Protected species are defined as those listed as threatened, endangered, or proposed or candidate for listing by the USFWS or those protected by or listed as having special status by the New Mexico Department of Game and Fish (NMDGF). Federal species of concern are not necessarily protected by law; however, these species may become listed, and therefore are given consideration when addressing biological resource impacts of an action.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the Endangered Species Act and sensitive ecological areas as designated by state or federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer/winter habitats).

3.8.2 Affected Environment

Kirtland AFB lies at the intersection of four major North American biotic provinces: the Great Plains, Great Basin, Rocky Mountains, and Chihuahuan Desert. Vegetation and wildlife found within the installation are influenced by each of these provinces, with the Great Basin being the most dominant influence. Elevations range from approximately 5,000 feet in the west to almost 8,000 feet in the Manzanita Mountains, providing a variety of ecosystems.

Kirtland AFB's Integrated Natural Resources Management Plan (INRMP) (Kirtland AFB, 2018a) provides interdisciplinary strategic guidance for natural resources management on the installation. Implementation of the INRMP ensures that the installation continues to support present and future mission requirements while preserving, improving, and enhancing ecosystem integrity (Kirtland AFB, 2018a).

Vegetation. Before the acquisition of land for what is now Kirtland AFB, the area consisted of rangeland used for livestock grazing, ranching, and mining operations. For the most part, these operations ceased when Kirtland AFB occupied the land in the mid-1940s. Since then, some of the vegetation has been cleared for operational developments, while the remainder (particularly within the Withdrawal Area) has mostly remained undisturbed (Kirtland AFB, 2018a).

Based on an analysis of aerial imagery and known project locations, all of the proposed project areas occur in previously disturbed habitats or in developed locations, except for Project 8 (approximately 0.23 acre) and Project 11 (approximately 0.44 acre), which both occur in grassland/sagebrush steppe habitat.

Grassland communities at Kirtland AFB are dominated by a mix of multiple grass species. Grassland habitats on the installation often mix with forb and/or shrub dominated habitats, as well. The grassland community in the western portion of Kirtland AFB is intermixed with sagebrush steppe habitat. Sand sagebrush is the dominant cover species, with the understory being similar to that of the adjacent grasslands.

Ground cover along and adjacent to the existing road network, including the proposed project areas that occur in previously disturbed land, consists of exposed dirt and an early successional community dominated by non-native grass and forb species, and scattered native plants. Overall,

plant cover is sparse within previously disturbed habitats on Kirtland AFB. No water features occur on or near the proposed project areas (Kirtland AFB, 2018a).

Wildlife. Wildlife communities at Kirtland AFB are typical of those in urban, woodland, and grassland habitats in the central New Mexico region. Within and in the vicinity of the proposed project areas, species that are common to disturbed, landscaped, or grassland habitats may occur. Species may be transient, inhabit several communities, or exist in transitional areas between vegetation communities. Species common to developed/disturbed areas include, among others, European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), house finch (*Haemorhous mexicanus*), coyote (*Canis latrans*), various rabbit species and rodents.

Grassland communities at Kirtland AFB contain a multitude of bird species, including, among others: horned lark (*Eremophila alpestris*), scaled quail (*Callipepla squamata*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), Crissal thrasher (*Toxostoma crissale*), lark sparrow (*Chondestes grammacus*), black-throated sparrow (*Amphispiza bilineata*), and western meadowlark (*Sturnella neglecta*). Raptor species known or expected to be found in grassland habitat, particularly for foraging, include the northern harrier (*Circus hudsonius*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), and great horned owl (*Bubo virginianus*).

Mammals that occur in grasslands at Kirtland AFB include desert cottontail (*Sylvilagus audubonii)*, black-tailed jack rabbit (*Lepus californicus*), spotted ground squirrel (*Xerospermophilus spilosoma*), black-tailed prairie dog (*Cynomys ludovicianus*), kangaroo rats (*Dipodomys* sp.), multiple species of mice, coyote, kit fox (*Vulpes macrotis*), American badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and bobcat (*Lynx rufus*).

Reptiles and amphibians found on Kirtland AFB in grassland habitats include Woodhouse's toad (*Anaxyrus woodhousii*), red-spotted toad (*Anaxyrus punctatus*), New Mexico spade foot toad (*Spea multiplicate*), western box turtle (*Terrapene ornata*), greater short-horned lizard (*Phrynosoma hernandesi*), lesser earless lizard (*Holbrookia maculata*), bull snake (*Pituophis catenifer*), Western diamondback rattlesnake (*Crotalus atrox*), and glossy snake (*Arizona elegans*) (Kirtland AFB, 2018a).

Special Status Species. A USFWS Information for Planning and Consultation Official Species and Habitat List was retrieved on 4 April 2022 under Consultation Code 02ENNM00-2018-SLI-1108 (USFWS, 2022). Although six federally listed species have the potential to occur at Kirtland AFB based on known species ranges (**Table 3.8-1**), there are no federally listed species or critical habitats occurring within the proposed project areas (Kirtland AFB, 2018a). Additionally, as indicated in **Section 2.4.1.5.1**, overflights would occur at 10,000+ MSL. Air operations at such altitudes would be largely undetectable from the ground. Therefore, the species listed in **Table 3.8-1** are not carried forward for further analysis in this EA.

Table 3.8-1 Federal and State-listed Species with Potential to Occur at Kirtland AFB and Below Special Use Airspace

Common Name	Scientific Name	Status		Occurrence	
		Federal	State	Proposed Project Areas	Under Airspace
New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	Endangered	Endangered	None	Potential
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	SGCN	None	Potential
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Endangered	None	Potential
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	SGCN	None	Potential
Rio Grande silvery minnow	*Hybognathus amarus*	Endangered	Endangered	None	Potential
Monarch butterfly	*Danaus plexippus*	Candidate	-	None	Potential

Notes: SGCN = Species of Greatest Conservation Need.
Sources: Kirtland AFB, 2018a; USFWS, 2022; NMDGF, 2022.

Based on data provided in the Biota Information System of New Mexico, there are 16 species listed by NMDGF as having special state statuses that may occur on Kirtland AFB (NMDGF, 2022). Biological surveys are conducted annually in order to monitor the occurrence of federally listed, state-listed, and other special status species on Kirtland AFB (Kirtland AFB, 2018a). **Table 3.8-2** lists which of those other special status species are known to occur on the installation within the proposed project areas.

Table 3.8-2 Other Special Status Species with Potential to Occur in the Proposed Project Areas and Below Special Use Airspace

Common Name	Scientific Name	Federal Status	State Status	Occurrence	
				Proposed Project Areas	Under Airspace
Gray Vireo	*Vireo vicinior*	-	Threatened	Not Likely	Potential
Peregrine Falcon	*Falco peregrinus*	Species of Concern	Threatened	Potential (foraging)	Yes
Loggerhead Shrike	*Lanius ludovicianus*	-	New Mexico Species of Greatest Conservation Need	Potential	Yes
Mountain Plover	*Charadrius montanus*	-	Sensitive Taxa	Not Likely	Potential
Western Burrowing Owl	*Athene cunicularia*	Species of Concern	-	Potential	Yes

Common Name	Scientific Name	Federal Status	State Status	Occurrence	
				Proposed Project Areas	Under Airspace
Long-legged Myotis	*Myotis volans*	-	Sensitive Taxa	Potential (foraging)	Yes
Western Small-footed Myotis	*Myotis ciliolabrum*	-	Sensitive Taxa	Potential (foraging)	Yes
Gunnison's Prairie Dog	*Cynomys gunnisoni*	-	Sensitive Taxa	Potential	Yes
Golden Eagle	*Aquila chrysaetos*	Bald and Golden Eagle Protection Act	-	Potential (foraging)	Yes

Sources: Kirtland AFB, 2018a; NMDGF, 2022.

Of the species in **Table 3.8-2**, the western burrowing owl (*Athene cunicularia*) and/or the Gunnison's prairie dog (*Cynomys gunnisoni*) have the greatest potential to occur within the proposed project areas. These two species can occupy overlapping territory in developed/disturbed and/or grassland habitats because burrowing owls regularly utilize abandoned prairie dog burrows (Kirtland AFB, 2018a).

The western burrowing owl, a federal species of concern, is a common resident at Kirtland AFB. They generally occur on the installation between March and October before migrating south, although a few birds may occur on the installation during mild winters. Burrowing owl inventories and population monitoring have been conducted every year since 1994, and a migration investigation was conducted to identify where nesting owls at Kirtland AFB go to winter (Kirtland AFB, 2018a). Because burrowing owls use prairie dog burrows for nesting and therefore have a close ecological association, per the INRMP (Kirtland AFB, 2018a), Kirtland AFB's Prairie Dog Management Plan also considers burrowing owl habitat requirements. The installation identifies and manages locations of nesting burrowing owls, including within the flightline and entire cantonment area, and has developed procedures to relocate owls if necessary. Signage and barriers for nest avoidance are placed where needed, including within developed areas and areas that are regularly mowed.

The state-threatened gray vireo (*Vireo vicinior*) is known to occur and breed on Kirtland AFB. It is most likely to be found within pinyon-juniper woodland habitat to the east (Kirtland AFB, 2018a), and therefore is only expected to occur outside of the proposed project areas.

The peregrine falcon (*Falco peregrinus*) is a federal species of concern and a state-threatened species known to occur and breed on base. An environmental generalist, it utilizes every habitat found on the installation and may also be found in urban environments. Peregrine falcons may forage for birds or small mammals in proposed project areas and/or installation airspace. Normally, it breeds on rocky cliffs, but has been known to breed in hangars near the airport (Kirtland AFB, 2018a).

The loggerhead shrike (*Lanius ludovicianus*), a New Mexico Species of Greatest Conservation Need, has been known to occur and breed on base. It utilizes the juniper woodland habitat, grasslands, and any other open areas. Current nesting areas are located south of Kirtland AFB on Isleta Pueblo. Shrikes have the potential to occur in the footprints for Projects 8 and 11, which contain grassland/shrub habitat.

The mountain plover (*Charadrius montanus*), a federal species of concern, has previously been seen brooding on the installation but is not known to regularly occur. Appropriate nesting habitat for this species is limited on Kirtland AFB; therefore, it is unlikely that the mountain plover uses the installation rangelands during the nesting season. However, the southern grasslands of the installation may potentially be used as brood-rearing habitat or during migration (Kirtland AFB, 2018a).

Two bat species identified on Kirtland AFB, the long-legged myotis (*Myotis volans*) and Western small-footed myotis (*Myotis ciliolabrum*), are identified by the NMDGF as sensitive taxa. Colonies in abandoned mines typically represent the largest concentrations of a single species that can be found under natural conditions. However, individuals may occur in the surrounding airspace when foraging at night.

On Kirtland AFB, golden eagles (*Aquila chrysaetos*) may be found year-round. These raptors use the installation as wintering grounds, foraging habitat during migration, and as part of their home range or simply for nesting during the breeding season. Golden eagles are best suited to hunting in open or semi-open areas and therefore may be found hunting for small mammals in grasslands and open shrublands on the edges of a proposed project area. Such areas might exist below installation airspace, especially if not currently mitigated by the installation's Bird/Wildlife Aircraft Strike Hazard (BASH) program. Cliffs and short, native vegetation seem to be most attractive to golden eagles and they tend to avoid developed areas of any type (from urban to agricultural) as well as heavily forested regions (Kirtland AFB, 2018a).

Critical Habitat and Other Habitats of Concern. Critical habitats are those areas of land, air, or water that are essential for maintaining or restoring threatened or endangered plant or animal populations. The USFWS has not designated or identified any critical habitat on Kirtland AFB. Although not considered critical habitat, surveys and literature indicate that important habitats on the installation include wetlands, which are rare in this region; prairie dog towns, which also provide nesting habitat for the western burrowing owl; and areas between 5,900 and 6,600 feet containing open juniper woodlands, which are used as nesting habitat by the gray vireo (Kirtland AFB, 2018a). There are no wetlands or open juniper woodlands identified as nesting habitat for the gray vireo within the proposed project areas. However, prairie dog towns that provide burrowing owl habitat may occur in the disturbed and/or grassland portions of the proposed project areas.

3.8.3 Environmental Consequences

3.8.3.1 Proposed Action

Vegetation. Implementation of the Proposed Action would result in both short- and long-term impacts to vegetation. However, as described in **Section 3.8.2**, all of the proposed project areas occur in previously disturbed habitats or in developed locations, except for Project 8 (approximately 0.23 acre) and Project 11 (approximately 0.44 acre), which both occur in grassland/sagebrush steppe habitat. Therefore, the majority of project impacts would occur in previously disturbed or developed areas that would not impact native vegetation. Kirtland AFB encompasses approximately 51,585 acres, 40,378 acres of which are undisturbed (78 percent of the installation) (Kirtland AFB, 2018a). The 0.67 acre of permanent impacts to grassland/sagebrush steppe habitat that would occur from implementation of Projects 8 and 11 would represent an insignificant percentage (<.002 percent of the 40,378 acres of undisturbed land at Kirtland AFB.

In addition, natural resources at Kirtland AFB are managed in accordance with the INRMP (Kirtland AFB, 2018a). Under the Proposed Action, management practices outlined by the INRMP, such as invasive weed control and erosion control, would be implemented to lessen potential impacts to plant communities. Therefore, impacts to vegetation would not be significant under the Proposed Action.

Wildlife. As described above, the proposed projects would not result in significant losses of habitat for wildlife. Under the Proposed Action, impacts to wildlife due to construction and/or modification activities would be minor. Noise associated with construction activities can affect birds and other wildlife in multiple ways, including reduced abundance in noisy habitats, changes in vigilance and foraging behavior, and impacts on individual fitness (Shannon, 2016). However, wildlife populations at Kirtland AFB, including birds protected under the Migratory Bird Treaty Act, are already exposed to elevated noise associated with military operations (which would be expected to increase by 1 dB or less under the Proposed Action). As a result, indirect impacts from construction noise would likely be insignificant because the ambient noise levels within the vicinity are elevated under existing conditions and would increase insignificantly from the relatively minor and temporary nature of the proposed construction activities. In addition, if construction and modification activities take place during breeding season for resident and migratory birds (generally between March 1 and September 31, depending on the species), Kirtland AFB would ensure that measures are put in place to protect nesting bird species, so as to avoid take of nests and young, including species protected under the Migratory Bird Treaty Act.

Implementation of the proposed construction and modification projects could eliminate or displace wildlife from the proposed project areas and their vicinities. Individuals of smaller, less mobile, and/or burrowing species could be killed or injured by construction in new project areas, whereas more mobile species (e.g., birds and larger mammal species) would disperse to surrounding areas. Any loss of or indirect impacts to commonly occurring individuals would not represent a significant portion of the population. Construction activities would be temporary, and following construction, wildlife would be able to occupy those portions of the proposed project areas that have not been developed.

Under the Proposed Action, there would be no change in airspace configurations. In addition, the proposed use of munitions is within the limits analyzed in previous NEPA documents. Therefore, there is no expected change in BASH potential (direct harm or death of wildlife species from airspace use) from the Proposed Action. Use of aircraft can cause noise and visual disturbance to wildlife. Impacts to wildlife from aircraft noise and visual stressors can include a startle reflex that induces running or flight, increased expenditure of energy, decreased time and energy spent on life functions such as feeding and mating, increased likelihood of predation, and interruption of breeding or nursing behavior (Larkin, 1996; Efroymson et al., 2000). However, wildlife are already exposed to ongoing airspace impacts at Kirtland AFB and the Proposed Action would not represent a significant change in impacts to wildlife. Therefore, impacts to wildlife would not be significant under the Proposed Action.

Special Status Species. As described in **Section 3.8.2**, there are no federally listed species known to occur at Kirtland AFB. Therefore, the Proposed Action will have No Effect on federally listed species. Potential impacts to other special status species that may occur in the proposed project areas and/or be exposed to project effects, as listed in **Table 3.8-2**, are described in the paragraphs below. In general, species that may occur in the vicinity of construction activities could be exposed to increased, temporary noise levels. As previously described, such noise impacts would be insignificant, as wildlife at Kirtland AFB are already exposed to military industrial/training noise. In addition, species that may occur under the airspace proposed for use would be exposed to aircraft training activities but are already exposed and/or habituated to such training impacts.

Gray vireo and mountain plover. Habitat does not occur in or near the proposed project areas for either of these species. Therefore, no habitat for these species would be impacted and they would not be exposed to construction-related noises. Both species have the potential to occur under the airspace proposed for use under the Proposed Action. However, as previously described, there would be no change in airspace configuration and airspace use would not be measurably different from ongoing training to induce significant impacts to avian species.

Loggerhead shrike. Habitat may occur in the vicinity of the proposed project areas or in the footprints of Projects 8 and/or 11. Per the INRMP, if construction occurs during nesting season (roughly March 1 to September 31), measures such as pre-activity nesting surveys would be implemented to reduce the likelihood of impacting nesting birds. A small amount of potential shrike habitat may be lost in these areas (Project 8, 0.23 acre; Project 11, 0.44 acre), and would not represent a significant impact in terms of available habitat to the species.

Long-legged and western small-footed myotis. No impacts to roosting habitat would occur because on Kirtland AFB, these areas consist of abandoned mines and other undisturbed structures. Aircraft that fly during daylight hours would also not impact foraging for these bat species because they hunt at night. Aircraft sorties that occur at night have the potential to impact foraging bats; however, nighttime sorties already occur in the airspace and the majority of flight activity would be above 10,000 feet MSL, well above activity levels for foraging myotis species.

Golden eagle and peregrine falcon. No impacts to either species' nesting habitat would occur under the Proposed Action. Golden eagles and peregrine falcons may forage under the airspace; however, both species are not likely to be measurably impacted by aircraft/airspace use under the Proposed Action, as they are currently exposed to ongoing aircraft training and airspace use.

Burrowing owl and Gunnison's prairie dog. These species have the potential for direct disturbance, harm, or loss as a result of construction activities, as they can both occur in disturbed and/or grassland habitats. Measures outlined in the INRMP (Kirtland AFB, 2018a) and the Kirtland AFB Prairie Dog Management Plan, such as pre-activity surveys and/or relocation, would be implemented to manage both species and reduce potential impacts. As such, any impacts to these species would be less than significant.

Critical Habitat and Other Habitats of Concern. There is no critical habitat at Kirtland AFB and no critical habitat would be impacted under the Proposed Action. Prairie dog towns are the only other type of habitat of concern that may occur in the proposed project areas. If a prairie dog town is discovered within a proposed project area, they would be addressed per the installation INRMP (Kirtland AFB, 2018a), in accordance with the current Prairie Dog Management Plan. Therefore, impacts to critical habitat or other habitats of concern would not be significant under the Proposed Action.

3.8.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not relocate the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.8.2** would remain unchanged. Therefore, no new impacts to biological resources would occur with implementation of the No Action Alternative.

3.9 CULTURAL RESOURCES

3.9.1 Regulatory Setting

Cultural resources consist of prehistoric and historic buildings, districts, sites, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can be divided into three major categories: archaeological resources (prehistoric and historic), architectural resources, and traditional cultural properties.

Archaeological resources are locations where human activity measurably altered the earth or left deposits of physical remains (e.g., tools, arrowheads, or bottles). "Prehistoric" refers to resources that predate the advent of written records in a region. These resources can range from a scatter composed of a few artifacts to village sites and rock art. "Historic" refers to resources that postdate the advent of written records in a region. Archaeological resources can include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features.

Architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered for protection under existing cultural resource laws. However, more recent buildings and structures, such as Cold War-era military buildings, may warrant protection if they have exceptional characteristics and the potential to be historically significant or if they are integral parts of a district that is eligible. These properties are evaluated under National Register of Historic Places (NRHP) Criteria Consideration G, which includes properties that have achieved significance within the past 50 years. Architectural resources must also possess integrity (i.e., important historic features must be present and recognizable in order to convey its significance).

Traditional cultural properties can include archaeological resources, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Tribal Nations or other groups consider essential for the continuance of traditional cultures.

Only cultural resources considered to be significant, known or unknown, warrant consideration with regards to adverse impacts resulting from a proposed action. To be considered significant, archaeological or architectural resources must meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the NRHP. The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
b. that are associated with the lives of persons significant in our past; or
c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
d. that have yielded, or may be likely to yield, information important in prehistory or history.

Several federal laws and regulations have been established to manage cultural resources, including the National Historic Preservation Act (NHPA) (1966), the Archaeological and Historic Preservation Act (1974), American Indian Religious Freedom Act (1978), the Archaeological

Resources Protection Act (1979), and Native American Graves Protection and Repatriation Act (1990).

On November 27, 1999, the DoD promulgated its Annotated American Indian and Alaska Native Policy, which emphasizes the importance of respecting and consulting with Tribal governments on a government-to-government basis. This Policy requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected Tribal resources, Tribal rights, and Indian lands before decisions are made by the respective services (DoD American Indian/Alaska Native Policy), as does DoD Instruction 4710.02, *Interaction with Federally Recognized Tribes* (September 14, 2006). Under Section 106 of the NHPA, the USAF is required to assess the effects of undertakings prior to initiation to ensure that there will be no adverse effects to historic properties (36 CFR Part 800).

Kirtland AFB maintains an Integrated Cultural Resources Management Plan (ICRMP) to aide in management of cultural resources on the installation in accordance with appropriate federal laws and other applicable USAF regulations (Kirtland AFB, 2018b).

3.9.2 Affected Environment

The affected environment for cultural resources is based on the establishment of the Area of Potential Effects (APE) of an undertaking, through consultation with the New Mexico SHPO. An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE, and therefore the affected environment for the Proposed Action includes areas where ground-disturbing activities, including new construction, facility modifications, and demolitions would occur, and includes the lands underlying the SUA and other existing airspace and training areas (see **Figure 2-3**).

Information on cultural resources on lands underlying the SUA and training areas was derived from conducting background research to identify NRHP and State Register of Historic Places properties beneath the affected airspace; national historic landmarks; national battlefields; national historic trails; cultural landscapes, historic forts, or historic ranches recorded or known within the same area; and American Indian Reservations, sacred areas, or traditional use areas.

Aircraft operations are most likely to affect historic buildings, structures, and districts where setting is an important aspect of a property's significance. Visual intrusions can include aircraft overflights which intrude into the viewshed of a cultural resource, thus adversely affecting its setting. The aircraft flying overhead has the potential to adversely affect the setting, feeling, and character of cultural resources within sight of the aircraft. For the SUA, aircraft would be flying above 10,000 feet MSL. A Memorandum of Agreement was signed in 2016 between the State and Federal Military Flying Organizations and the New Mexico Indian Affairs Department regarding military low-level overflights of Tribal Lands (Zunie et al., 2016). The Memorandum of Agreement includes an airspace request communication flow chart to ensure that cultural and ceremonial events will not be affected by low-level overflights.

The release of chaff and flares could have a visual effect from residual materials which remain on the ground or land on structures or at sacred sites. Studies have shown that chaff and its debris do not pose a significant threat to the visual integrity of archaeological and architectural resources (Government Accountability Office [GAO], 1998). Chaff does not accumulate to any great degree and the fibers, if found, were often mistaken for natural elements such as animal fur or plant material. The fibers generally dissipate within a few days due to mechanical breakdown from wind, sediment erosion, and rain or snow. Chaff residual plastic materials are typically 1 inch by

1 inch. Flare residual plastic materials, usually red or blue in color, can be 1 inch by 2 inches or larger. Overall, chaff and flares are unlikely to adversely affect cultural resources. The residual materials from chaff and flares fall to the ground in a dispersed fashion and do not collect in quantities great enough to adversely affect the integrity and subsequent NRHP status of archaeological or architectural resources. Impacts to traditional cultural properties are more difficult to assess, and no studies have been conducted on traditional cultural properties with regard to chaff and flare residual materials. When a plastic chaff or flare piece is found and identified in conjunction with a cultural resource, the individual finding the piece may be annoyed.

Kirtland AFB is consulting with the New Mexico SHPO and the Bureau of Indian Affairs. Government-to-government consultation also occurred with the Tribes and Pueblos that are located beneath or near the affected airspace or may have traditional ties to these lands to include: The Navajo Nation, San Carlos Apache Tribe, Mescalero Apache Tribe of the Mescalero Apache Reservation, Apache Tribe of Oklahoma, Jicarilla Apache Nation, The Hopi Tribe, White Mountain Apache Tribe, Ysleta del Sur Pueblo, Fort Sill Apache Tribe of Oklahoma, Kiowa Tribe of Oklahoma, Comanche Nation of Oklahoma, Pawnee Nation of Oklahoma, Southern Ute Indian Tribe, Ute Mountain Ute Tribe, Wichita and Affiliated Tribes, Tonkawa Tribe of Indian of Oklahoma, Pueblo of Acoma, Pueblo of Cochiti, Pueblo of Isleta, Pueblo of Jemez, Pueblo of Laguna, Pueblo of Nambe, Ohkay Owingeh Pueblo, Pueblo of Picuris, Pueblo of Pojoaque, Pueblo of San Felipe, Pueblo of San Ildefonso, Pueblo of Sandia, Pueblo of Santa Ana, Pueblo of Santa Clara, Pueblo of Santo Domingo, Pueblo of Taos, Pueblo of Tesuque, Pueblo of Zia, and Pueblo of Zuni. See Appendix A for all Section 106 and government-to-government correspondence.

3.9.2.1 Archaeological Resources

Kirtland AFB covers 51,585 contiguous acres southeast of Albuquerque, New Mexico. Of these lands, which include Department of Energy (DOE) land, BLM-Albuquerque withdrawn land, and U.S. Forest Service/Cibola National Forest withdrawn land, Kirtland AFB is responsible for the management of 44,052 acres. Kirtland AFB has conducted an installation-wide survey of archaeological and architectural resources (Kirtland AFB, 2018b).

Over 100 archaeological surveys were conducted at Kirtland AFB from 1976 to the present day. These surveys resulted in the recordation of 740 archaeological sites, 251 of which were determined eligible for listing in the NRHP. These sites contain artifacts such as pottery, ground stone, stone tools, and historic artifacts. Many of the archaeological sites on Kirtland AFB contain features including hearths, prehistoric structures, storage pits, historic structures, mines, weapons testing structures, and military training structures. No known cemeteries are present at Kirtland AFB (Kirtland AFB, 2018b).

The Proposed Action includes approximately 315,200 SF of new ground disturbance. The entirety of the APE for the Proposed Action has been recently surveyed for archaeological resources and no archaeological sites were identified (Sisneros, 2022)

One NRHP-listed archaeological site, Fort Sumner, is located beneath the Pecos North MOA within the town of Fort Sumner. However, the exact location is not available as it is sensitive information and is not available to the public (National Park Service [NPS], 2022a). This NRHP-listed archaeological site is located outside of Kirtland AFB.

The Los Ojitos site is located in the vicinity of Fort Sumner and is listed in State Register of Cultural Properties (New Mexico Historic Preservation Division, 2012). However, the exact location is not available as it is sensitive information and is not available to the public. It is possible that this

archaeological site underlies the Pecos North MOA. The Los Ojitos site is located outside of Kirtland AFB.

3.9.2.2 Architectural Resources

Kirtland AFB was established in the late 1930s as a training installation for the Army Air Corps. Construction of the Albuquerque Army Air Base began in January 1941 with permanent barracks, warehouses, and a chapel. Kirtland AFB was expanded in the late 1940s and 1950s with new buildings, hangars, and the east-west runway, due to its increased role in supporting the nation's defense. Since 1984, 17 historic structure evaluation studies were conducted at Kirtland AFB. A total of 2,189 facilities have been evaluated for NRHP eligibility at Kirtland AFB, 271 of which were determined eligible to the NRHP. Kirtland AFB contains one NRHP-eligible historic district, the Manzano Base, a determination which received SHPO concurrence in 2005 (Kirtland AFB, 2018b; Hanks, 2005).

Table 3.9-1 lists the architectural resources that would be directly or indirectly impacted by the Proposed Action. There would be no architectural resources impacted by Projects 1, 2, 7, 8, 9, 10, 11, or 12. The Proposed Action would impact three NRHP-eligible architectural resources. Project 4 would involve the renovation of Hangar 1002, an NRHP-eligible building. The renovations would be limited to the building's interior and would include administrative offices, storage areas, restrooms, and a break room. Additional modifications include asbestos removal; heating, ventilation, and air conditioning replacement; and upgrades to the fire protection system and electrical system. Project 5 consists of a temporary addition to Building 949 for WST with a small 144 SF permanent electrical shed added. Two NRHP-eligible resources, Buildings 955 and 956 are within the viewshed (0.25 mile) of Project 5. Project 13a would renovate the interior of Building 733 and Project 13b includes modifications to Building 737 including the removal and replacement of the double-walled oil/water separator located below ground to the southwest of the building.

Table 3.9-1 Architectural Resources Associated with Proposed Action

Project #	Building #	Building Name/Use	Date Constructed	NRHP Status	SHPO Concurrence
3	957	Flight Training Classroom	1997	Not evaluated	N/A
4	1002	Hangar	1953	Eligible	9/30/2002
5	949	Flight Simulator Training	1996	Not eligible	9/23/2002
	955*	Flight Simulator Training	1977	Eligible	9/23/2002
	956*	Flight Simulator Training	1981	Eligible	9/23/2002
6	950	Flight Simulator Training	2008	Not evaluated	N/A
13a	737	Munitions Maintenance Shops	1999	Not evaluated	N/A
13b	733	Munitions Maintenance Shops	1999	Not evaluated	N/A

Notes: *Buildings are located within the viewshed of Project 5.
Source: Kirtland AFB, 2018b.

There are five NRHP-listed architectural resources located beneath the SUA and all underlie the Pecos North MOA. These resources include the De Baca County Courthouse, Fort Sumner Community House/Fort Sumner Woman's Club, Fort Sumner Railroad Bridge, Fort Sumner Cemetery Wall and Entry, and the Fort Sumner State Monument (NPS, 2022a; **Table 3.9-2**). These five architectural resources are also listed in the State Register of Cultural Properties (New Mexico Historic Preservation Division, 2012). Additionally, two architectural resources are listed in the State Register of Cultural Properties: Rodrick Drug Store and Taiban Church (**Table 3.9-2**).

The Rodrick Drug Store is located in the town of Fort Sumner and underlies the Pecos North MOA, and the Taiban Church is located in the town of Taiban, underlying the Taiban MOA.

There are no historic trails, national monuments, national sites of remembrance, or historic battlefields located beneath the airspace of the Proposed Action (NPS, 2022b, 2022c, 2022d).

Table 3.9-2 NRHP-listed and State-listed Architectural Resources Beneath the Airspace

Resource Identification	County	City/Town	Airspace
De Baca County Courthouse*^	De Baca	Fort Sumner	Pecos North MOA
Fort Sumner Community House/ Fort Sumner Woman's Club*^	De Baca	Fort Sumner	Pecos North MOA
Fort Sumner Railroad Bridge*^	De Baca	Fort Sumner	Pecos North MOA
Fort Sumner Cemetery Wall and Entry*^	De Baca	Fort Sumner	Pecos North MOA
Fort Sumner State Monument*^	De Baca	Fort Sumner	Pecos North MOA
Rodrick Drug Store^	De Baca	Fort Sumner	Pecos North MOA
Taiban Church^	De Baca	Taiban	Taiban MOA

Notes: * = NRHP-listed; ^ = State Register-listed.
Source: NPS, 2022a; New Mexico Historic Preservation Division, 2012.

3.9.2.3 Traditional Cultural Properties

To date, no known traditional cultural properties, Native American burial grounds, or sacred places have been identified at Kirtland AFB (Kirtland AFB, 2018b). Kirtland AFB is currently consulting with the 35 federally recognized Tribal Nations and Pueblos, both in- and out-of-state, which may be historically, culturally, or linguistically affiliated with the area and have an interest in protecting traditional cultural properties and cultural resources located at Kirtland AFB and underlying the SUA.

3.9.3 Environmental Consequences

Section 106 of the NHPA empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion in the NRHP. Once cultural resources have been identified, significance evaluation is the process by which resources are assessed relative to established significance criteria and criteria considerations. Cultural resources that have been determined to be eligible for listing in the NRHP are called "historic properties."

Analysis of potential impacts on cultural resources is based on the following considerations: (1) physically altering, damaging, or destroying all or part of a resource; (2) altering characteristics of the surrounding environment that contribute to resource significance; (3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or (4) neglecting the resource to the extent that it deteriorates or is destroyed. The potential to directly disturb cultural resources can be assessed by identifying the type and location of the proposed action and by determining the exact locations of cultural resources that could be affected. Effects that are farther removed from the immediate project area including visual, audible (noise), or atmospheric changes due to project implementation are harder to quantify.

Only those cultural resources that would reasonably be affected by visual (overflights) and noise intrusions are considered under the SUA. These include architectural resources; archaeological resources with standing structures, such as historic ranches, ghost towns, American Indian settlements; and traditional cultural properties. Prehistoric and historic archaeological sites

lacking standing structures are not included as they are generally ground surface or even subsurface deposits that would not be affected by the Proposed Action. Some prehistoric archaeological sites could contain natural structures such as rock shelters or caves. These structures often house petroglyphs or pictographs, which are etched or painted onto the rock surfaces. However, studies have found that these types of natural formations are not affected any more by noise vibrations, such as sonic booms, than by natural erosion, wind, or seismic activity (Battis, 1983). There would not be a potential for sonic booms to damage structures. Overpressure values are used to provide a general picture of pounds per square feet resulting in supersonic flight. Actual overpressure would vary based on maneuvers (climb/descent, turns, acceleration/deceleration) and specific weather conditions (winds, vertical temperature/pressure profile).

For areas under the airspace, cultural resources with standing structures that are listed in or are eligible for listing in the NRHP or State Registers, national historic landmarks; national battlefields; national historic trails; cultural landscapes, historic forts, or historic ranches recorded or known within the same area; and Tribal Nations and Pueblos, sacred areas, or traditional use areas were considered. These resources are ones typically found in the NRHP or State Register. Conversely, if NRHP-listed properties are not affected by the project elements, then non-listed resources are unlikely to be affected. The USAF recognizes that hundreds of other cultural resources, some documented and some not yet discovered, exist under the airspace. However, aircraft operations are most likely to affect historic structures and districts where setting is an important criterion for significance and where noise vibrations from sonic booms could adversely impact those types of resources.

3.9.3.1 Proposed Action

3.9.3.1.1 Archaeological Resources

Projects 1, 2, 3, 5, 6, 8, 9, 10, 11, 12, and 13b of the Proposed Action involve ground-disturbing activities. However, the entirety of the APE for the Proposed Action has been recently surveyed for archaeological resources. No archaeological resources were identified during this survey (Sisneros, 2022), and there are no previously recorded archaeological sites within the APE for the Proposed Action (Kirtland AFB, 2018b). In the event of an unanticipated discovery during ground-disturbing operations, the following specific actions would occur. The project manager would cease work immediately and the discovery would be reported to the Kirtland AFB Cultural Resources Manager. The Cultural Resources Manager would secure the location and ensure that all cultural items are left in place, and that no further disturbance is permitted to occur. The Cultural Resources Manager would then contact a qualified archaeologist to inspect the site and would continue to follow Standard Operating Procedure 7.4, Cultural Discoveries, as described in the 2018 Kirtland AFB ICRMP (Kirtland AFB, 2018b). Under the Proposed Action, the AC-130J operations would result in fewer sorties in the airspace than the operations for the C-130 airframe assessed in previous NEPA analysis.

The airspace and range noise was previously evaluated in the *AFSOC Assets Beddown at Cannon Air Force Base, New Mexico Environmental Impact Statement* (USAF, 2007). Therefore, archaeological resources would not be analyzed for noise or airspace impacts under the Proposed Action. Visual intrusions beneath the SUA under the Proposed Action would be minimal and would not represent an increase sufficient to cause adverse impacts to the settings of archaeological resources. Due to the high altitude of the overflights, the aircraft would not be readily visible to observers on the ground. For the Proposed Action, aircraft would be flying at an altitude above 10,000 feet MSL. At these altitudes, aircraft would not have a visual impact to archaeological resources on the ground.

No additional ground disturbance would occur under the SUA due to the Proposed Action. Use of ordnance and defensive countermeasures would occur in areas already used for these activities. Flares deployed from the aircraft would not pose a visual intrusion either, as flares are small in size and burn only for a few seconds and the high relative altitude of the flights would make them virtually undetectable to people on the ground. Overall, flares are unlikely to adversely affect cultural resources. Therefore, the introduction of material to archaeological sites or standing structures from the use of flares would not have an adverse effect on these resources.

Under these conditions, there would be no significant impacts to archaeological resources with implementation of the Proposed Action.

3.9.3.1.2 Architectural Resources

Project 4 of the Proposed Action calls for the renovation of Hangar 1002, an NRHP-eligible building. Because the renovations would be limited to the building's interior, the Proposed Action would not impact the character-defining features of the historic property. Project 5 consists of a temporary addition to Building 949 for WST with a small 144 SF permanent electrical shed added. Two NRHP-eligible resources, Buildings 955 and 956 are within the viewshed of Project 5; however, the setting of these buildings and associated viewshed are not character-defining characteristics that determine their eligibility and would not be impacted.

During construction, the noise level would range from 70 dB to 40 dB from construction activities. This would be further reduced by attenuation from being within a building, which generally provides a 25 dB reduction in noise with windows closed, and a 15 dB reduction in noise with windows open. Given that construction would be temporary and done during daytime hours, there would be no long-term adverse impacts to architectural resources or historic properties from any of the construction projects associated with the Proposed Action.

AC-130J flight operations in and around Kirtland AFB would be very similar to those performed by the MC-130J and HC-130J aircraft currently based there. The proposal to increase the USAF activity with AC-130J aircraft conducting 4,500 annual flight operations represents an increase of about 3.5 percent over the representative current operations. This would be a 1 dB increase from 39 dB to 40 dB in a change to the setting of the NRHP-listed architectural resources.

There are five NRHP-listed architectural resources located beneath the SUA and all underlie the Pecos North MOA. Two State Register of Cultural Properties are located beneath the SUA consisting of Rodrick Drug Store (Pecos North MOA) and the Taiban Church (Taiban MOA). However, the proposed use of the airspace would be similar to ongoing training operations. Given the current use of the airspace and the nature of the proposed future use of the project areas, there would be no significant impacts to architectural resources.

Visual intrusions to architectural resources under the Proposed Action would be similar to archaeological resources discussed above; therefore, there would be no significant impacts to architectural resources.

Use of ordnance and defensive countermeasures under the Proposed Action to architectural resources would be similar to the archaeological resources discussed above; therefore, there would be no significant impacts to architectural resources.

Thus, there would be no significant impacts to architectural resources at Kirtland AFB or beneath the SUA with the implementation of the Proposed Action.

3.9.3.1.3 Traditional Cultural Properties

No traditional cultural properties have been identified at Kirtland AFB or the lands underlying the SUA. Government-to-government consultation is being conducted between Kirtland AFB and the federally recognized Tribal Nations and Pueblos, both in- and out-of-state, which may be historically, culturally, or linguistically affiliated with the area and have an interest in protecting cultural resources located at Kirtland AFB and underlying the SUA. Consultation is being conducted for this action in recognition of their status as sovereign nations, to provide information regarding Tribal concerns per Section 106 of the NHPA as well as information on traditional resources that may be present on or near the installation and beneath the SUA. An initial government-to-government consultation letter was sent on August 24, 2022 to the 35 federally recognized Tribal Nations and Pueblos.

To date, no responses have been received from federally recognized Tribal Nations and Pueblos associated with Kirtland AFB and the lands underlying the SUA.

Therefore, there would be no impacts to traditional cultural properties with implementation of the Proposed Action.

Additionally, there would be no adverse effects to historic properties with implementation of the Proposed Action.

3.9.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action associated with the relocation of the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1** would not occur. Cultural resources would continue to be managed in accordance with the Kirtland AFB ICRMP and would be expected to remain as described under affected environment in **Section 3.9.2**. Therefore, there would be no significant impacts to cultural resources under the No Action Alternative.

3.10 INFRASTRUCTURE

3.10.1 Regulatory Setting

Infrastructure refers to the system of public works, such as utilities, which provide the underlying framework for a community. Utilities include such amenities as water, power supply, and waste management. The infrastructure components to be discussed in this section include the electrical system, natural gas, liquid fuel, water supply system, sanitary sewer/wastewater, communications, and solid waste.

3.10.2 Affected Environment

Electrical System. Kirtland AFB purchases electrical power from the Western Area Power Administration. Electric lines are placed above and below ground, feeding the 20 substations on the installation. The installation's average yearly consumption is approximately 407,010 kilowatt hours (Kirtland AFB, 2016).

Natural Gas and Propane. Natural gas is supplied by Coral Energy and delivered in New Mexico Gas Company pipelines supplying the industrial complex, family housing, and heating plants on the installation. There are approximately 496,000 linear feet of natural gas mains (Kirtland AFB, 2016). Rural portions of the installation do not receive natural gas service and rely on propane, which is delivered to and stored in local propane storage tanks.

Liquid Fuel. Liquid fuels are supplied to Kirtland AFB by contractors. The primary liquid fuels supplied include JP-8 (jet propellant [fuel] – type 8), diesel, and unleaded gasoline. Fuels are purchased in bulk, delivered to the installation by tanker truck, and stored in various-sized storage tanks across the installation. Liquid fuels at Kirtland AFB are primarily used to power military aircraft and ground-based vehicles (Kirtland AFB, 2016).

Water Supply System. Water is supplied to Kirtland AFB by six groundwater wells and two distribution systems that have a collective water-pumping maximum capacity of 8.1 million gallons per day (mgd). The installation pumps an average of 5.5 mgd of treated, potable water through 160 miles of distribution mains (Kirtland AFB, 2016). There are also approximately 50 miles of non-potable water pipeline serving the Tijeras Golf Course and providing water for fire protection. In 2017 (the most recent date for which this information was available) (Kirtland AFB, 2016), Kirtland AFB pumped a total of 744 million gallons (2,283 acre-feet) of water from these wells. The installation can also purchase water from the Albuquerque-Bernalillo County Water Utility Authority to meet demand during peak periods; however, the amount of water purchased from the city has been negligible since 1998. The 2019 GAO report identified Kirtland AFB as being at risk of water scarcity and vulnerable to drought and desertification (GAO, 2019).

Sanitary Sewer/Wastewater System. Approximately 491,000 linear feet of sanitary system mains transports wastewater to the Albuquerque Bernalillo County Water Utility Authority treatment facility. The permissible discharge rate for Kirtland AFB is fixed at 70.805 million gallons per month. The installation discharges an average of approximately 42 million gallons per month (Kirtland AFB, 2016). Some facilities in remote areas and other portions of the installation are not serviced by the sanitary sewer system; these facilities use isolated, onsite septic systems to dispose of wastewater.

Communications System. The communication network on Kirtland AFB was constructed as two separate systems that were later connected to provide redundancy. The main information transfer node is located on the west side of the installation. The Communication Main Switch Facility is located on the east side of the installation.

Solid Waste Management. Solid waste generated at Kirtland AFB is collected by a contractor and disposed of at the city of Albuquerque's Cerro Colorado Landfill. The Cerro Colorado Landfill receives approximately 6,574 cubic yards per year from Kirtland AFB (Kirtland AFB, 2020b).

Kirtland AFB operates a construction and demolition waste-only landfill on the installation. This landfill accepts only construction and demolition waste from permitted contractors working on the installation and has a net waste capacity of 7.2 million cubic yards (Kirtland AFB, 2016). As of 31 December 2020, the remaining capacity of this landfill was 2.11 million cubic yards (Kirtland AFB, 2022g). In 2019 and 2020, an average of 134,000 cubic yards of construction and demolition waste per year was deposited in this landfill (Kirtland AFB, 2022g).

3.10.3 Environmental Consequences

3.10.3.1 Proposed Action

Electrical System. New electrical infrastructure would be constructed to support the increased use of electrical power. New substations would be constructed where appropriate to step down voltage to distribution lines supplying power to the newly constructed or modified buildings. Western Area Power Administration would provide electrical service and would be tapped from existing transmission lines to provide permanent power. Rooftop solar panels could be installed on select buildings to offset utility costs as a BMP. Disruption of service to surrounding areas

could occur during construction and interconnection; however, this is expected to be a short-term inconvenience. No impacts from connection of electrical power to the proposed project areas is anticipated. An increase in electrical capacity would be expected due to the increase in personnel and operations from the Proposed Action but would be accommodated by the electrical system.

Natural Gas and Propane. Coral Energy would provide natural gas to the proposed project areas via the New Mexico Gas Company pipelines. Buried natural gas lines would be constructed to provide service to the individual facilities proposed for construction and connected from existing pipelines. Facilities to be modified as part of the Proposed Action would have natural gas connected from existing pipelines as needed. Disruption of gas service to surrounding areas could occur during construction and connection to existing natural gas lines; however, this would be a short-term inconvenience. No impacts from construction and connection to natural gas supplies are anticipated.

Liquid Fuel. Liquid fuels would continue to be supplied to Kirtland AFB by contractors and stored in various-sized storage tanks across the installation. There would be no impacts to liquid fuel consumption or supply from the proposed facility construction or modification activities. The Proposed Action would increase the number of sorties from the airfield by two to three sorties per training day. This would increase the volume of fuel needed to operate aircraft for the additional training. Operationally, ground vehicles to support the Proposed Action would increase the amount of fuel used; however, the daily increases from the added sorties and ground support vehicles would not significantly increase the overall amount of fuel that is supplied to the base.

Water Supply System. The Proposed Action would require the installation of water lines to the newly constructed facilities and the addition of water lines to facility modifications, as necessary. Low flow fixtures would be implemented to new construction as a BMP for water conservation efforts. The new lines would be connected to the existing water supply system on base. Water pressure or water to specific sites during construction could be impacted, but it would be temporary and localized during the construction and modification phase. There would be no impact to the water supply system post construction. The amount of water needed to support the relocation of the 412 personnel permanently stationed on based would increase. However, the increase in water consumption would be more than sufficiently serviced by the base's current water supply, which has the capability of pumping an additional 2.6 mgd. The installation has the option to purchase additional water from the Albuquerque-Bernalillo County Water Utility Authority to meet peak demand but has not had to for decades. During FY 2020, more than 23,000 individuals were employed by Kirtland AFB, of which 3,505 were active duty personnel. With a maximum of 412 additional personnel being relocated to Kirtland AFB, this represents approximately an 11 percent increase of active duty personnel to the base. The base currently pumps approximately 35 percent of its allowable groundwater allocation from the Santa Fe Aquifer. Though the GAO reports that Kirtland AFB is at risk of water scarcity, the current water supply would be able to support the additional personnel that would be stationed at Kirtland AFB as part of the Proposed Action. As such, the installation would continue to monitor any climate change related impacts to water supply for the installation and address, as needed. Therefore, impacts to the water supply system would not be expected from the Proposed Action.

Sanitary Sewer/Wastewater System. New wastewater pipelines would be installed to support the new facilities and facility modifications. Wastewater from the new construction and facility modifications would be piped to the Albuquerque Bernalillo County Water Utility Authority treatment facility. The permissible discharge rate for Kirtland AFB is fixed at 70.805 million gallons per month. Currently, Kirtland AFB discharges approximately 42 million gallons per month. The additional wastewater generated from the Proposed Action, including additional permanent personnel residing on base, would not impact the wastewater system as there is sufficient

discharge capacity for the base. Therefore, no impacts from the Proposed Action on the sanitary sewer or wastewater system are expected.

Communications System. The Proposed Action would require the installation of new communications lines to the newly constructed facilities and new communication lines as needed for the facility modifications. During construction, impacts to the communication system would be temporary and localized. Post construction impacts to the communications systems as a result of the Proposed Action are not expected.

Solid Waste Management. Solid waste generated from construction and facility modification activities would be disposed of in the landfill on the installation, specifically for construction and demolition solid waste. The landfill has 2.11 million cubic yards of capacity remaining and would not be impacted by the solid waste generated as part of Proposed Action.

Solid waste generated from facilities and personnel post construction would be collected by the same contractor that services the rest of the base. The additional waste generated from the relocation of the AFSOC AC-130J FTU to Kirtland AFB would not generate enough additional waste such that contractor services would become insufficient. Therefore, impacts to the solid waste management system would not be expected from the Proposed Action.

3.10.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action associated with the relocation of the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.10.2** would remain unchanged. Therefore, no new impacts to infrastructure would occur with implementation of the No Action Alternative.

3.11 HAZARDOUS MATERIALS AND WASTES

3.11.1 Regulatory Setting

"Hazardous materials," "hazardous waste," and "toxic substances," broadly defined, can all be classified as "hazardous substances" as defined by the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 because they may present a threat to human health and/or the environment. The phrase "hazardous substance" is used in this document to describe any item or agent (i.e., biological, chemical, or physical) that has the potential to cause harm to humans, animals, or the environment. Definitions of these terms are summarized below.

Hazardous Materials. Hazardous materials are defined by 49 CFR § 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous Wastes. Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 USC § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in, mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." The USAF

maintains a Hazardous Waste Management Plan (HWMP) as directed by Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*. Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273.

Toxic Substances. A toxic substance is a chemical or mixture of chemicals that may present an unreasonable risk of injury to health or the environment. These substances include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act (15 USC § 53).

USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR Part 763, with additional regulations concerning emissions at 40 CFR Part 61. Asbestos is regulated by the USEPA under the Clean Air Act, Toxic Substances Control Act of 1976, and CERCLA. USEPA has established that any material containing more than 1 percent asbestos is considered an ACM. Any ACM that is friable or will be made friable during modification or demolition activities in any public access or commercial building must be inspected and properly abated prior to modification or demolition if the amount exceeds the trigger levels of 260 linear feet on pipes, 160 SF on other surfaces, or the volume equivalent of a 55-gallon drum (35 cubic feet).

The disposal of PCBs is addressed in 40 CFR Parts 750 and 761. PCBs are a group of chemical mixtures used as insulators in electrical equipment, such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the U.S. throughout the 1950s and 1960s. PCBs can be present in products and materials produced before the 1979 ban. Common products that might contain PCBs include electrical equipment (e.g., transformers and capacitors), hydraulic systems, and fluorescent light ballasts.

Federal agencies are required to comply with applicable federal, state, and local laws related to LBP activities and hazards. With the passing of The Consumer Product Safety Act in 1977, the federal government required all paint manufactured after February 1978 to be below a maximum amount of 0.06 percent lead by weight for use in commercial and residential facilities. Any paint with amounts of lead exceeding the 0.06 percent threshold is considered LBP. Whether from LBP abatement or other activities, depending on the quantity or concentration, the disposal of the LBP waste from nonresidential facilities is regulated by RCRA in 40 CFR Parts 262-265.

Contaminated Sites. The DoD developed the Environmental Restoration Program (ERP) to facilitate thorough investigation and cleanup of contaminated sites on military installations (i.e., active installations, installations subject to Base Realignment and Closure, and Formerly Used Defense Sites) though both the Installation Restoration Program and the Military Munitions Response Program (MMRP). The Installation Restoration Program required each active/operating DoD installation to identify, investigate and clean up hazardous substances, pollutants, and contaminants. The MMRP addressed nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. A description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in the identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contamination plume has been completed).

The DOE developed the Office of Environmental Restoration and Waste Management in 1989 to ensure that past, present, and future operations do not threaten human health or environmental health and safety. The DOE Office of Site Closure is responsible for achieving closure of Environmental Restoration (ER) sites in a manner that is safe, cost-effective, and coordinated with stakeholders. The current investigation being conducted at Kirtland AFB under the ER program is intended to determine the nature and extent of hazardous and radioactive contamination and to restore any sites where such materials pose a threat to human health or the environment.

For the USAF, Air Force Policy Directive 32-70, *Environmental Quality*, and Air Force Regulation 2-7000 series incorporate the requirements of all federal regulations and other AFIs and DoD Directives for the management of hazardous materials, hazardous wastes, and special hazards.

3.11.2 Affected Environment

Environmental Management System. Kirtland AFB has implemented an Environmental Management System (EMS) program in accordance with International Organization for Standardization 14001 Standards; EO 13834, *Regarding Efficient Federal Operations* [revoking EO 13693]); and AFI 32-7001, *Environmental Management*. The EMS policy prescribes to protect human health, natural resources, and the environment by implementing operational controls, pollution prevention environmental action plans, and training.

All personnel, to include contractors, are made aware of the Kirtland AFB EMS program. All project-related activities should be conducted in a manner that is consistent with relevant policy and objectives identified in the installation's EMS program. Project Managers shall ensure that all personnel are aware of environmental impacts associated with their activities and reduce those impacts by practicing pollution prevention techniques.

***Hazardous Materials and Petroleum Products*.** Contractors proposing to use hazardous materials on the installation shall notify the 377th Mission Support Group/Civil Engineering Installation Environmental Compliance (377 MSG/CEIEC) Hazardous Material Program by submitting a completed Hazardous Material Worksheet and a list of all materials along with their associated Safety Data Sheets prior to use. The Kirtland AFB Spill Prevention, Control, and Countermeasures (SPCC) Plan provides operating procedures to prevent the occurrence of spills, control measures to prevent spills from entering surface waters, and countermeasures to contain and cleanup the effects of an oil spill that could impact surface waters (Kirtland AFB, 2018c).

Kirtland AFB has identified the Environmental Office as the responsible entity to oversee hazardous material tracking on the installation. Part of their responsibilities is to control the procurement and use of hazardous materials to support USAF missions, ensure the safety and health of personnel and surrounding communities, and minimize USAF dependence on hazardous materials. The Kirtland AFB Environmental Office is charged with managing hazardous materials to reduce the amount of hazardous waste generated on the installation in accordance with the Kirtland AFB HWMP (Kirtland AFB, 2021p). Typical hazardous materials used within the installation include solvents, paints, adhesives, sealants, petroleum/oils/lubricants, and batteries. Contractors bringing hazardous materials onto the installation must notify the Kirtland AFB Environmental Office's Hazardous Material Program Team by submitting a completed Hazardous Material Worksheet and a list of all materials along with their associated Safety Data Sheets.

There are no records of hazardous material or petroleum product spills within the proposed project areas. However, chlordane was sold until 1988 as an insecticide for treating termites within residential homes and low levels of chlordane have been identified in soil samples at various

housing areas throughout Kirtland AFB (Kirtland AFB, 2017). A health risk assessment conducted at Zia Park, where Project 7 is located, determined existing levels of chlordane at that location is very low and does not pose an unacceptable risk (Legendre, 2010). It is possible that residual chlordane may be present in on-site soils at other locations on former housing sites. Any hazardous waste created by residential or recreational areas would have been characterized as household waste, however, and not subject to RCRA.

Hazardous and Petroleum Wastes. The 377 MSG/CEIEC Hazardous Waste Program is responsible for implementing the hazardous waste management program at Kirtland AFB through waste characterization; establishing collection sites; receiving and processing hazardous waste for turn-in; reporting, tracking logs, and manifesting; regulatory interface; recordkeeping; and hosting and conducting inspections (Kirtland AFB, 2021p).

Kirtland AFB is a large-quantity generator of hazardous waste (USEPA ID #NM9570024423). The installation's HWMP provides guidance for waste identification, storage, transportation, and disposal and establishes the procedures to comply with applicable federal, state, and local standards for solid waste and hazardous waste management. The Kirtland AFB HWMP describes the roles and responsibilities of all entities at Kirtland AFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. While numerous units are responsible for various functions of generation and management of hazardous waste, it is ultimately the waste generators (host and tenant organizations and on-site contractors) who are responsible for ensuring that hazardous waste management functions comply with the HWMP (Kirtland AFB, 2021p).

Toxic Substances. Toxic substances include ACM, LBP, and PCBs, all of which are typically found in building and utility infrastructure. The presence of toxic substances, including describing their locations, quantities, and condition, assists in determining the significance of a proposed action.

Concrete on Kirtland AFB does not contain ACM or LBP (Underwood, 2020), and roads, aprons, pads, sidewalks, curb and gutters, taxiways, driveways, duct banks, parking lots, shoulders, gates, retaining walls, and flag poles within the proposed project areas are not areas of concern for toxic substances. The potential for ACM, LBP, and PCBs is therefore not an issue of concern for the proposed project areas that involve new construction, and these are dismissed from further consideration.

Hangar 1002, where renovations are planned, is known to contain existing ACM, LBP, and PCBs. Projects 3, 5, 13a, 13b (Buildings 957, 949, 737, and 733, respectively) are existing structures proposed for modification or an addition; however, these structures were all built between 1996 and 1999 and have a limited potential to contain ACM, LBP, and PCBs.

Environmental Restoration Program. Kirtland AFB has 58 active ERP sites that include known and suspected soil and groundwater contamination associated with landfills, oil/water separators, drainage areas, septic systems, fire training areas, and spill areas. Kirtland AFB has seven active MMRP sites, comprising 3,238.3 acres. These sites are former impact areas that are primarily located along the outer perimeter and center of the installation. The sizes, types of munitions debris, and potential for unexploded ordnance varies by location (Kirtland AFB, 2013).

Additionally, the DOE actively manages 11 open ER sites on Kirtland AFB property, including three groundwater areas of concern and eight solid waste management units. None of the ER sites located within or adjacent (defined as within 0.5 mile of the proposed project areas) to the proposed project areas and are not carried forward for review.

Figure 3.11-1 presents the location of ERP and MMRP sites on Kirtland AFB. There are no active ERP or MMRP sites located within the proposed project areas. There is one MMRP site located adjacent and four active ERP sites located adjacent to the proposed project areas. The ERP and MMRP sites and their proximity to the proposed project areas are summarized in **Table 3.11-1**.

Table 3.11-1 Active ERP and MMRP Sites Within or Adjacent to the Proposed Action Areas

ERP/MMRP Site No.	Site Title	Site Status	Proximity to Proposed Action Area
LF-001	Landfill No. 1	Active	Adjacent
SS-575	Transient Alert Pad	Petition for NFA	Adjacent
ST-70B	Building 377 OWS	CA Complete	Adjacent
ST-70C	Building 381 OWS	CA Complete	Adjacent
ST-70D	Building 471 OWS	CA Complete	Adjacent
ST-70E	Building 481 and 482 OWS	Active	Adjacent
ST-70G	Building 20205 OWS	CA Complete	Adjacent
ST-70H	Building 20375 OWS	CA Complete	Adjacent
ST-106 & SS-111	Bulk Fuels Facility Spill source	Active	Adjacent
ST-220	Building 1001 Plating and Anodizing	Petition for NFA	Adjacent
ST-286	East Storm Sewer System	Petition for NFA	Adjacent
ST-288	Building 614 Septic System	Petition for NFA	Adjacent
ST-289	Building 617/620 Septic System	Petition for NFA	Adjacent
ST-291	Building 617 Septic System	Petition for NFA	Adjacent
ST-299	Building 751 Septic System	Petition for NFA	Adjacent
ST-325	Building 1000 H-3/H-53 Phase dock floor drain	Petition for NFA	Adjacent
ST-330	Building 1032 Septic System	Petition for NFA	Adjacent
ST-331	Building 1000 C-130 Maintenance Shop Storm Sewer System	Petition for NFA	Adjacent
TG-100	Bomb Target	Active	Adjacent

Notes: Adjacent – within 0.5 mile of proposed project areas.
CA = Corrective Action; NFA = No Further Action; OWS = oil/water separator

A description of the active ERP and MMRP sites is provided below:

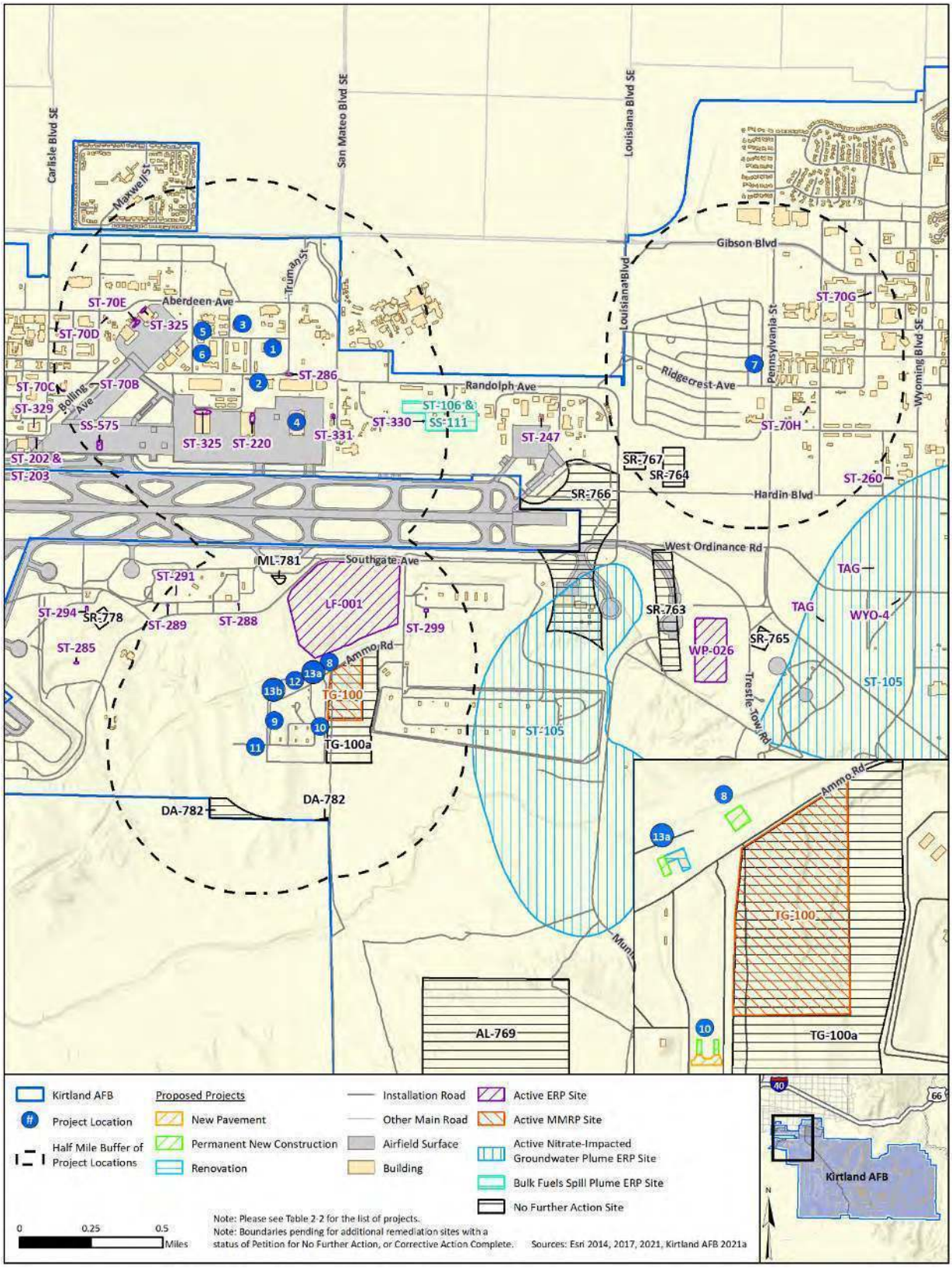

Figure 3.11-1 Kirtland AFB Active ERP Sites and MMRP Sites

ERP Site LF-001 – Landfill No. 1, located north and northeast of Projects 8, 12, 13a, and 13b (see **Figure 3.11-1**), was operated as a trench-and-fill landfill from 1951 to 1975. Investigations have determined that aluminum, antimony, beryllium, chromium, cobalt, iron, lead, manganese, mercury, nickel, thallium, vanadium, anthracene, benzo(a)pyrene, benzo(k)fluoranthene, 1,4-dichlorobenzene, benzo(a)anthracene, benzo(b)fluoranthene, bis(2-ethylhexyl) phthalate, fluorine, indeno(1,2,3-c,d) pyrene, naphthalene, phenol, and pyrene are present in the soil. NMED selected an evapotranspiration cover as the recommended corrective measure for this site (Kirtland AFB, 2020c). The 2006 Corrective Measures Implementation Report noted that the activities completed included construction of the final evapotranspiration cover and associated drainage/erosion control system, installation of temporary stormwater controls and site fencing, performing required testing and inspections, grading, and site seeding/revegetation. A voluntary long-term monitoring and maintenance program is conducted using one upgradient and three downgradient wells and monthly inspections are conducted to ensure the integrity of the evapotranspiration cover and erosion control. Regular maintenance activities and monthly monitoring, as well as monitoring after every 0.5-inch rainfall event are conducted. In addition, groundwater in the vicinity of the landfill is sampled on an annual basis. The samples are analyzed for inorganics and volatile organic compounds. No concentrations above USEPA maximum contaminant levels have been observed since the landfill was capped (Kirtland AFB, 2020c).

ERP Site ST-70E – Former oil/water separator for Buildings 481 and 482 located west of Project 5 and northwest of Project 6 (see **Figure 3.11-1**). Petroleum hydrocarbon contamination was found to be present in soils and soil vapor adjacent to the oil/water separator. The concentrations of contaminants in groundwater at the site have been below applicable contaminant thresholds. The site is currently being remediated with soil vapor extraction methods (Kirtland AFB, 2021q).

ERP Site ST-106 & SS-111 – The Bulk Fuels Facility Spill, located approximately 0.25 miles east of Project 4 (see **Figure 3.11-1**), is a groundwater plume located in the northwestern portion of Kirtland AFB. The groundwater plume is trending north and east away from the installation toward the city of Albuquerque. The facility and associated infrastructure operated from 1953 until 1999. During this time, the fueling area was separated into a tank holding area where bulk shipments of fuel were received and a fuel loading area where individual fuels trucks were filled. The facility was removed from service in 1999 after the discovery of fuel leaking in subsurface piping at the rail unloading point. It was initially believed that the leak only affected surface soil within the immediate area; however, through further investigation, the installation learned that the leaked fuel reached the groundwater table. As part of the remediation process, soil vapor extraction units were installed to remediate soil contamination and numerous groundwater and soil vapor monitoring wells were installed on and off the installation to further investigate the contamination. These wells are sampled quarterly as part of the regular sampling schedule performed on the plume and concentrations for all compounds analyzed in the effluent samples collected were below their respective project screening levels (Kirtland AFB, 2018d).

MMRP Site TG-100 – The 14.8-acre Bomb Target munitions response area, located southeast of Projects 8 and 13a, and northeast of Project 10 (see **Figure 3.11-1**), is classified as an air-to-ground range in an area located within the broad floodplain of the Tijeras Arroyo. Ordnance used at this site included 100-pound practice bombs and incendiary bombs based on the presence of tail fins, incendiary bombs and other debris (Kirtland AFB, 2013). The initial 159 target anomalies removed from the site as part of remediation efforts are the primary sources of potential Munitions and Explosives of Concern (MEC)/Material Potentially Presenting an Explosive Hazard (MPPEH) at this site and may have resulted in the potential presence of MEC/MPPEH on and below the ground surface (Kirtland AFB, 2020d). Further remediation efforts were conducted in 2019 to remove additional MEC/MPPEH. Although soil sampling results found no chemicals of potential

concern (explosive constituents, metals, and semi-volatile organic compounds) in the soil, on-going monitoring and soil sampling will be conducted until the site is fully restored and released by the USEPA (Kirtland AFB, 2020d).

3.11.3 Environmental Consequences

3.11.3.1 Proposed Action

Environmental Management System. FTU personnel associated with the proposed AFSOC AC-130J FTU relocation would operate under the existing 58 SOW, which participates in the EMS program and would continue to do so under the Proposed Action. Contractors associated with construction activities would be made aware of the installation's EMS program by reviewing the environmental commitment statement and ensuring construction activities are conducted in accordance with the policy and objectives of the EMS program. All contractors would be made aware of environmental impacts and would reduce those impacts by practicing pollution prevention techniques and complying with existing standard operating procedures and applicable federal and state laws governing the use, generation, storage, and transportation of hazardous materials. The Proposed Action would not alter the EMS program and there would be no adverse impacts to the EMS program resulting from implementation of the Proposed Action.

Hazardous Materials and Petroleum Products. The Proposed Action may have short-term and long-term negligible adverse impacts on hazardous materials and petroleum products at Kirtland AFB. The proposed relocation of aircraft is not expected to result in a change in the types of hazardous materials and petroleum products in use. Because implementation of the Proposed Action would result in seven additional aircraft at Kirtland AFB, an increase in the use of hazardous materials and petroleum products is anticipated, although the additional volume is not anticipated to be sufficient to require new aboveground storage tanks. If petroleum storage tanks are required by the Proposed Action, the tanks will be installed in accordance with applicable laws and regulations, and the NDED will be notified. Additionally, 58 SOW would continue to participate in the EMS and its associated programs that facilitate the responsible management of hazardous materials at Kirtland AFB. In the event new aboveground storage tanks or increased quantities of petroleum products require an increase in available storage capacity or storage areas, the SPCC Plan would be amended to include the increased capacity. Through ongoing participation in EMS and SPCC programs at Kirtland AFB, the specific types and quantities of hazardous materials and petroleum products present would continue to be monitored and tracked.

Construction equipment would utilize hazardous materials and petroleum products such as fuel, solvents, hydraulic fluid, oil, antifreeze, and other hazardous materials in small quantities. These products might also be used for minor equipment servicing and repair activities. Under the Proposed Action, the handling and storage of any hazardous materials and petroleum products would be carried out in compliance with applicable laws and regulations. Implementation of the Proposed Action would adhere to applicable management plans (i.e., SPCC Plan). The severity of a potential impact from an accidental release would vary based upon the extent of a release and the substance(s) involved.

The Proposed Action would result in short-term, negligible, adverse impacts should any hazardous materials or petroleum products be released into the environment during construction activities. The installation of additional aircraft could result in long-term, negligible adverse impacts associated with a minor increase in the use of hazardous materials and petroleum at Kirtland AFB.

Hazardous and Petroleum Wastes. The Proposed Action is anticipated to result in an increase in the generation of hazardous or petroleum wastes due to the additional aircraft present at Kirtland AFB; this may have a short-term and long-term negligible adverse impact on hazardous and petroleum wastes. Any additional petroleum waste produced for maintenance activities would be managed under the existing base-wide SPCC Plan.

Construction activities requiring the use of hazardous materials and petroleum products results in the generation of hazardous wastes and used petroleum products. Under the Proposed Action, hydraulic fluids and petroleum products, such as diesel and gasoline, would be used in the vehicles and equipment supporting construction. Implementation of BMPs and environmental protection measures would reduce the potential for an accidental release of these materials. All construction equipment would be maintained according to the manufacturer's specifications and drip mats would be placed under parked equipment as needed.

Unknown, potentially hazardous wastes and petroleum products could possibly be discovered or unearthed during implementation of the Proposed Action. In such cases, contractors would immediately cease work, contact appropriate installation personnel, and await sampling and analysis results before taking any further action. If contamination is encountered, state and/or federal agencies will be notified, as appropriate. All generated or unknown hazardous and petroleum wastes would be handled, stored, and disposed of in accordance with applicable laws, regulations, and management plans (i.e., HWMP). The Proposed Action would result in a short-term, negligible, adverse impact on the generation of hazardous and petroleum wastes. Construction activities are not anticipated to result in long-term impacts from hazardous wastes, as they are temporary activities that would be required to comply with all applicable management plans and appropriate disposal practices.

Toxic Substances. Facilities requiring demolition during modification or building addition activities that have the potential to contain ACM, PCBs, and LBP will be evaluated for toxic substance abatement prior to their demolition or building addition. Prior to initializing the demolition activity, notification would be provided in compliance with the AEHD-AQD regulations for National Emissions Standards for Hazardous Air Pollutants related to asbestos. Any regulated ACM, PCB, and/or LBP from demolition activities would be disposed of at a permitted site in accordance with federal and state laws. With BMPs in place, no adverse impacts are anticipated.

Environmental Restoration Program. The Proposed Action does not occur within any active ERP or MMRP sites. Approximately 15 of the sites have received or have pending NMED approval of No Further Action status or Corrective Action complete and are considered to be clean; therefore, no impact would be expected to occur from or to the Proposed Action in these areas and they are not discussed further.

Projects 8–13 are adjacent to the active ERP Site LF-001 and MMRP Site TG-100 (see **Figure 3.11-1**). Projects 1–6 are adjacent to the active ERP Sites ST-70E and ST-106 & SS-111 (see **Figure 3.11-1**). No construction or demolition activities are proposed within the ERP and MMRP sites and there is no potential for contamination from these sites to migrate into the proposed project areas. Therefore, implementation of the Proposed Action would not be expected to result in any impacts on or be impacted by ERP and/or MMRP sites.

3.11.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not relocate the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions

discussed in **Section 3.11.2** would continue. Therefore, implementation of the No Action Alternative would not result in any new or additional impacts on hazardous materials and wastes.

3.12 SAFETY

Safety addresses the ground safety, explosive safety, and flight safety associated with the proposed AFSOC AC-130J FTU relocation to Kirtland AFB. Ground safety considers issues associated with facility construction/modification, operations and maintenance activities, emergency response, and anti-terrorism/force protection (AT/FP). Ground safety also considers the safety of personnel, facilities, and the public that may be placed at risk from flight operations in the vicinity of the airfield and in the airspace. Although ground and flight safety are addressed independently, it should be noted that in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns.

3.12.1 Regulatory Setting

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety address workers' and public health and safety during and following construction, demolition, and training activities. Site safety requires adherence to regulatory requirements imposed for the benefit of employees and the public. Site safety includes implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DoD and military branch-specific requirements designed to comply with standards issued by federal OSHA, USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment (PPE), administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

Health and safety hazards can often be identified and reduced or eliminated before an activity begins. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself, together with the exposed (and possibly susceptible) population or public. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazards include transportation, maintenance, and repair activities, and the creation of a noisy environment or a potential fire hazard. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments due to noise or fire hazards for nearby populations. Noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

Contractor Safety. Occupational safety and health programs address the health and safety of people at work. Occupational safety and health regulations cover potential exposure to a wide range of chemical, physical, and biological hazards, and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, or use of PPE. Occupational health and safety is the responsibility of each employer, as applicable. Employer responsibilities are to review potentially hazardous workplace conditions; monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous substances), physical (e.g., noise propagation, falls), and biological (e.g., infectious waste, wildlife, poisonous plants) agents, and ergonomic stressors; recommend and evaluate controls (e.g., prevention, administrative, engineering, PPE) to ensure exposure to personnel is eliminated or adequately controlled; and ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to the use of respiratory

protection, engaged in hazardous waste work, asbestos, lead, or other work requiring medical monitoring.

New Mexico is one of several states that administer their own occupational safety and health program according to the provision of the federal OSHA of 1970, which permits a state to administer its own occupational safety and health program if it meets all of the federal requirements regarding the program's structure and operations. The New Mexico Occupational Health and Safety Bureau program has the responsibility of enforcing occupational health and safety regulations within the state of New Mexico. Its jurisdiction includes all private and public entities such as city, county, and state government employees. Federal employees are excluded as they are covered by federal OSHA regulations.

Military Personnel Safety. Each branch of the military has its own policies and regulations to protect its workers, despite their work location. AFI 91-202, *The US Air Force Mishap Prevention Program,* "establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information." In order to meet the goals of minimizing loss of USAF resources and protecting military personnel, mishap prevention programs should address groups at increased risk for mishaps, injury of illness; a process for tracking incidents; funding for safety programs; metrics for measuring performance; safety goals; and methods to identify safety BMPs. AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements Air Force Policy Directive 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet federal safety and health requirements. This instruction applies to all USAF activities.

Public Safety. The Albuquerque Fire Rescue provides fire suppression, crash response, rescue, emergency medical response, and hazardous substance response to the nearby city of Albuquerque. The Albuquerque Fire Rescue has 729 full-time, uniformed firefighter/emergency medical technicians; 471 basic emergency medical technicians; 202 paramedics; and 22 fire engine companies (Albuquerque Fire Rescue, 2020).

AT/FP. Due to the threat of terrorist activities, the DoD and the USAF have developed a series of AT/FP guidelines for military installations:

- Unified Facilities Criteria (UFC) 4-010-01, DoD Minimum Antiterrorism Standards for Buildings (2022)
- UFC 4-022-01, Security Engineering: Entry Control Facilities/Access Control Points (2017)
- AFI 10-245, Antiterrorism (AT) (2015)
- DoD Directive 2000.12, DoD Antiterrorism Program (2017)
- DoD Instruction 2000.16, DoD Antiterrorism Standards (2006)
- Joint Publication 3-07.2, Antiterrorism (2010)

In addition to addressing those elements directly related to prevention of terrorist acts, these guidelines address a range of considerations that include access to the installation, access to facilities on the installation, facility siting, exterior design, interior infrastructure design, and landscaping.

Explosive Safety. Ordnance is required to be handled and stored in accordance with USAF explosive safety directives (Air Force Manual 91-201), and all munitions maintenance is carried out by trained, qualified personnel using USAF-approved technical data.

Siting requirements for munitions and ammunition storage and handling facilities are based on safety and security criteria. Defined distances are maintained between munitions storage areas and a variety of other types of facilities. These distances, defined by quantity-distance (Q-D) arcs, are determined by the type and quantity of explosive material to be stored. Within these Q-D arcs, development is either restricted or prohibited altogether to ensure safety of personnel and minimize potential for damage to other facilities in the event of an accident. In addition, explosives storage and handling facilities must be located in areas where security of the munitions can be maintained at all times. Identifying the Q-D arcs ensures that construction does not occur within these areas.

Aircraft Safety. Aircraft flight operations at Kirtland AFB are governed by standard flight rules set forth under USAF Manual 11-202 Volume 3. The 58th Operating Group (58 OG) also maintains an Inflight Guide for aircraft operating at Kirtland AFB (58 OG, 2018).

Aircraft mishaps are classified as A, B, C, or D (**Table 3.12-1**). Class A mishaps are the most severe with total property damage of $2 million or more or a fatality and/or permanent total disability. Comparison of Class A mishap rates for various aircraft types, as calculated per 100,000 flying hours, provide the basis for evaluating risks among different aircraft and levels of operations.

Table 3.12-1 DoD Mishap Classifications

Mishap Class	Total Property Damage	Fatality/Injury
A	$2,000,000 or more and/or aircraft destroyed	Fatality or permanent total disability
B	$500,000 or more but less than $2,000,000	Permanent partial disability or three or more persons hospitalized as inpatients
C	$50,000 or more but less than $500,000	Nonfatal injury resulting in loss of one or more days from work beyond day/shift when injury occurred
D	$20,000 or more but less than $50,000	Recordable injury or illness not otherwise classified as A, B, or C

Source: DoD, 2018.

C-130 aircraft (all models) have flown more than 20 million hours since the aircraft entered the USAF inventory in 1955. Over that period, 164 Class A mishaps have occurred, and 93 aircraft have been destroyed. This results in a lifetime Class A mishap rate of 2.45 annual mishaps per 100,000 flight hours and a lifetime destroyed aircraft rate of 0.46 annual aircraft destroyed per 100,000 flight hours (Air Force Safety Center, 2021).

3.12.2 Affected Environment

The affected environment for ground, explosive, and aircraft safety includes the airfield at Kirtland AFB and surrounding areas; as well as airspace utilized during training and operations. Airspace utilized by Kirtland AFB are described in detail in **Section 3.2, Airspace Management**.

Contractor Safety. All contractors performing construction and demolition activities at Kirtland AFB are responsible for following federal and state of New Mexico safety regulations and are

required to conduct construction and demolition activities in a manner that does not increase risk to workers or the public.

Public Safety. The Albuquerque Fire Rescue provides emergency and medical response for the city of Albuquerque, including the vicinity around Kirtland AFB. Kirtland AFB has its own emergency services department. The emergency services department provides the installation with fire suppression, crash response, rescue, emergency medical response, hazardous substance protection, and emergency response planning and community health and safety education. Albuquerque Fire Rescue and Kirtland AFB maintain a mutual services agreement for emergency response.

AT/FP. AT/FP standards and guidelines have evolved and postdate many of the facilities at numerous military installations, including Kirtland AFB. Thus, under current conditions, many units do not fully comply with all present AT/FP standards. However, as new construction occurs, AT/FP standards are incorporated to the maximum extent practicable.

Explosive Safety. The 58 SOW controls, maintains, and stores all ordnance and munitions required for mission performance. Q-D arcs have been created and are maintained in accordance with all USAF explosive safety directives. Ample storage facilities currently exist at Kirtland AFB and all facilities are approved for the ordnance they store.

Aircraft Safety. Current aircraft based at Kirtland AFB include MC-130J and HC-130J. The Kirtland AFB BASH program tracks bird and wildlife strikes that occur during training and operations of aircraft at the installation. Between October 2016 and September 2021, 293 bird/wildlife strikes were documented at Kirtland AFB. Of the 293 documented strikes, 1 incident was classified as Class C, 1 incident as Class D, 18 incidents as Class E, and 273 incidents were not classified (Kirtland AFB, 2022h).

Aircraft based at Kirtland AFB utilize various airspace as described in **Section 3.2, Airspace Management**. Flight operations are conducted in compliance with USAF standard flight rules and the 58 OG Inflight Guide.

3.12.3 Environmental Consequences

3.12.3.1 Proposed Action

Contractor Safety. Thirteen construction or modifications projects would occur under the Proposed Action. There would be a short-term increase in safety risk to contractors during construction and modification-related activities due to operation of heavy equipment, increases in noise levels, and increases in dust and particulate matter. Project 4, a proposed renovation of Island B located in Hangar 1002, which includes removal of ACM, LBP, and PCBs has the potential to pose increased health risk to renovation contractors due to possible exposure to the toxic substances; however, all contractors would use appropriate PPE, as applicable. All contractors would follow federal and state of New Mexico safety regulations and are required to conduct construction and demolition activities in a manner that does not increase risk to workers or the public; therefore, no increase in adverse impacts due to the Proposed Action are expected.

Public Safety. Construction and modification activities under the Proposed Action would occur entirely within Kirtland AFB boundaries and would be conducted in accordance with federal and state regulations and in a manner that would not result in any greater safety risk to the public. Additionally, construction and modifications would not result in an increase in obstructions to aircraft navigation. The mutual aid agreement between Kirtland AFB and Albuquerque Fire

Rescue would remain in place; therefore, no adverse impacts to safety are expected under the Proposed Action.

Military Personnel Safety. Military personnel involved in construction and modification-related activities would comply with all AFOSH and USAF Mishap Prevention program requirements in order to minimize safety risks to personnel and to comply with all federal safety regulations. Additionally, military personnel involved in the operation and maintenance of AC-130J aircraft would continue to comply with all USAF and 58 OG flight requirements.

AT/FP. All construction and modification projects would be conducted in full compliance with AT/FP requirements from design to completion.

Explosive Safety. No construction or modification activities under the Proposed Action would occur with the established Q-D arcs at Kirtland AFB. The 58 SOW would continue to store and maintain all explosives and munitions in accordance with USAF explosive safety directives (Air Force Manual 91-201), and all munitions maintenance would be carried out by trained, qualified personnel using USAF-approved technical data; therefore, no increases to explosive risk are anticipated under the Proposed Action.

Aircraft Safety. Under the Proposed Action, AC-130J flight operations in and around Kirtland AFB would be very similar to those performed by the MC-130J and HC-130J aircraft currently based there. AC-130J aircraft would conduct approximately 4,500 annual flight operations, resulting in an increase of about 3.5 percent over the representative current operations. The existing BASH program would continue, and the slight increase in aircraft operations that would occur under the Proposed Action are not expected to significantly increase the risk of BASH.

All aircraft would be operated in accordance with standard USAF flight rules, as well as the 58 OG In-flight Guide. Additionally, construction activities under the Proposed Action would not result in any greater safety risk or obstructions to navigation; therefore, no increased risk to aircraft safety is expected under the Proposed Action.

3.12.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not relocate the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.12.2** would continue. Therefore, implementation of the No Action Alternative would not result in any new or additional impacts on safety.

3.13 SOCIOECONOMICS

3.13.1 Regulatory Setting

Socioeconomics comprises the basic attributes and resources associated with the human environment, particularly population and economic activity. Socioeconomics impacts would be considered significant if the Proposed Action resulted in a substantial shift in population trends and notably affected regional employment, income, housing, or schools and other community services.

Regulations that guide the socioeconomic analysis include the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500–1508) and specifically include 40 CFR § 1508.1(g)(1) and 40 CFR § 1508.1(m).

3.13.2 Affected Environment

Bernalillo County is considered the ROI for socioeconomic effects of the Proposed Action (**Figure 3.13-1**). Socioeconomic data provided in this section are presented for Bernalillo County, the state of New Mexico, and the U.S. to characterize baseline socioeconomic conditions, which are used to gauge the level of impacts that are associated with project activities. Additional data are presented for the City of Albuquerque in some locations for reference. Data have been collected from documents published by federal, state, and local agencies and from state and national databases (e.g., U.S. Census Bureau [USCB] and U.S. Bureau of Labor Statistics [USBLS]).

3.13.2.1 Population

According to the 2020 U.S. Census, the population of Bernalillo County was 676,444 people (USCB, 2020a). The state of New Mexico's population totaled 2,117,522 in 2020 (USCB, 2020a).

The population of Bernalillo County grew 19 percent from 2000 to 2010 and 2.1 percent from 2010 to 2020. The growth rate between 2000 and 2020 was higher than the growth rate of the state of New Mexico (13.2 percent) and of the U.S. (9.7 percent) but between 2010 and 2020 the growth rate was lower than state of New Mexico (2.8 percent) and of the U.S. (7.4 percent). **Table 3.13-1** presents the 2000, 2010, and 2020 population data (USCB, 2000, 2020a).

Table 3.13-1 Population in the Region of Influence as Compared to the City of Albuquerque, New Mexico, and the United States (2000 to 2020)

Location	2000	2010	2020	Percent Change (2000 – 2010)	Percent Change (2010 – 2020)	Total Percent Change (2000 – 2020)
United States	281,421,906	308,745,538	331,449,281	9.7%	7.4%	17.8%
New Mexico	1,819,046	2,059,179	2,117,522	13.2%	2.8%	16.4%
Bernalillo County	556,678	662,564	676,444	19.0%	2.1%	21.5%
City of Albuquerque	448,607	545,852	564,559	21.7%	3.4%	25.8%

Source: USCB, 2000, 2020a.

3.13.2.2 Employment and Earnings Characteristics

The three largest industries in Bernalillo County in terms of percentage of the workforce employed within the industry are: the educational services, and health care and social assistance industry (26.7 percent); the professional, scientific, and management, and administrative and waste management services industry (14.7 percent); and the retail trade industry (10.7 percent). The construction industry employs 22,068 workers which represents 6.9 percent of the workforce (USCB, 2020b). In March 2022, the USBLS reported a 4.0 percent unemployment rate in Bernalillo County while the U.S. had a lower unemployment rate of 3.6 percent (USBLS, 2022a, 2022b). **Table 3.13-2** presents labor force and unemployment data for Bernalillo County, the city of Albuquerque, the state of New Mexico, and the U.S.

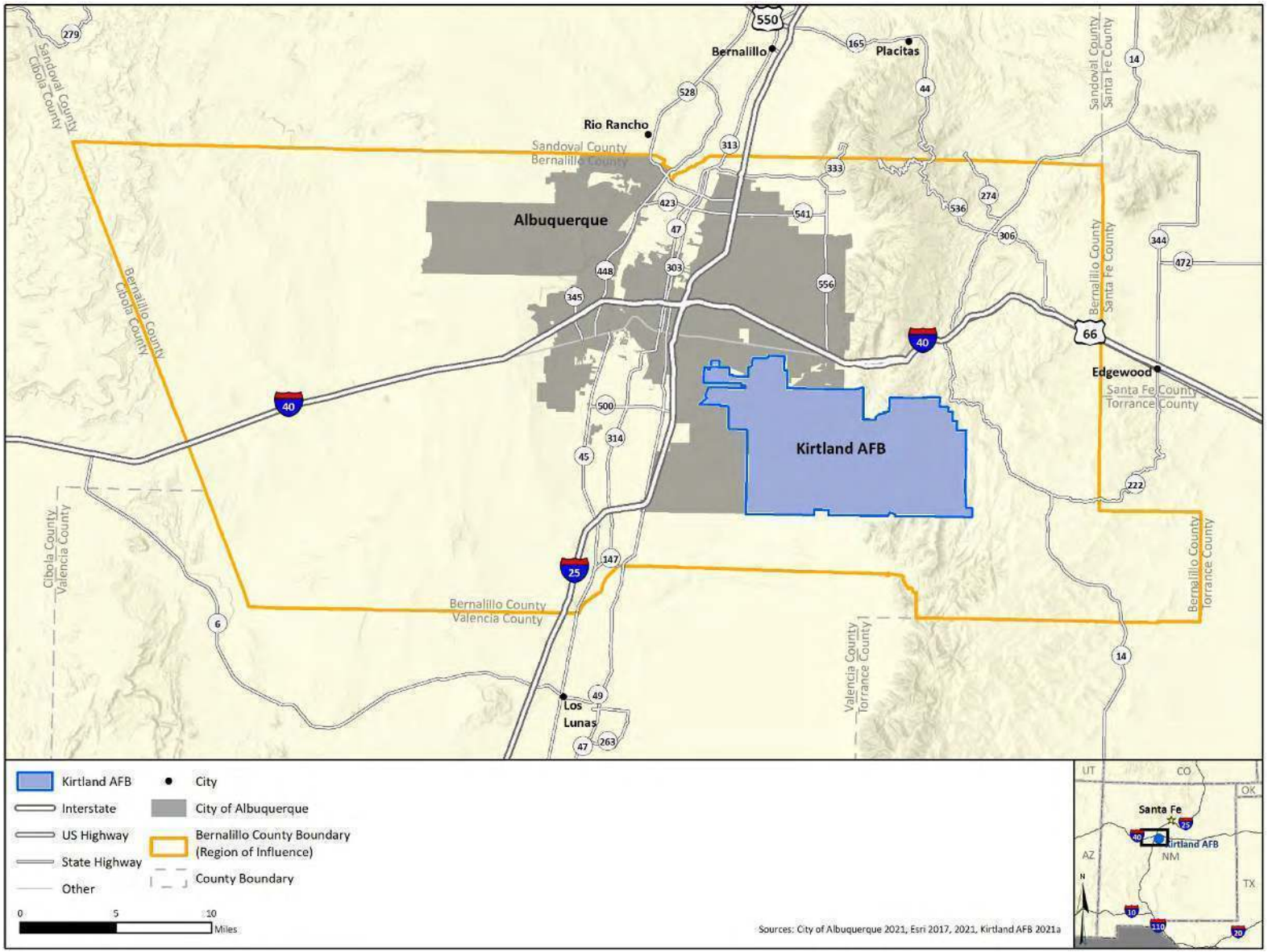

Figure 3.13-1 Socioeconomics ROI

Table 3.13-2 Employment in the Region of Influence as Compared to the City of Albuquerque, New Mexico, and the United States (March 2022)

Location	Civilian Labor Force	Employed	Unemployed	Unemployment Rate
United States	164,409,000	158,458,000	5,952,000	3.6%
New Mexico	1,671,424	897,974	50,412	5.3%
Bernalillo County	336,684	323,159	13,525	4.0%
City of Albuquerque	441,063	422,886	18,177	4.1%

Source: USBLS, 2022a, 2022b, 2022c, 2022d.

Table 3.13-3 presents income information for Bernalillo County as well as for comparison locations. Median household income, mean household income, median earnings for workers, and per capital income in Bernalillo County were all lower than national levels but were higher than levels for the state of New Mexico.

Table 3.13-3 Incomes in the Region of Influence as Compared to the City of Albuquerque, New Mexico, and the United States

Location	Median Household Income	Mean Household Income	Median Earnings for Workers	Per Capita Income
United States	$64,994	$91,547	$36,280	$35,384
New Mexico	$51,243	$70,241	$30,357	$27,945
Bernalillo County	$54,308	$74,163	$32,142	$31,229
City of Albuquerque	$53,936	$72,426	$32,361	$31,103

Source: USCB, 2020b.

3.13.2.3 Housing

According to the USCB, Bernalillo County had 22,583 vacant housing units and a rental vacancy rate of 7.1 percent in 2020. The median value of owner-occupied housing units and the median gross rent in Bernalillo County were lower than in the U.S. but higher than in the state of New Mexico or the city of Albuquerque (see **Table 3.13-4**).

Table 3.13-4 Housing in the Region of Influence as Compared to the City of Albuquerque, New Mexico, and the United States

Location	Total Housing Units	Vacant Housing Units	Rental Vacancy Rate	Median Value of Owner-Occupied Housing Units	Median Gross Rent	Persons per Household
United States	138,432,751	16,078,532	5.8%	$229,800	$1,096	2.6
New Mexico	943,568	150,813	8.3%	$175,700	$857	2.6
Bernalillo County	295,111	22,583	7.1%	$205,500	$892	2.5
City of Albuquerque	247,926	18,225	7.3%	$204,100	$889	2.4

Source: USCB, 2020c.

3.13.2.4 Schools

Table 3.13-5 presents information on schools in Bernalillo County. According to the National Center for Education Statistics, over the 2019–2020 and 2020–2021 school years, there were 248 schools with 98,987 students in Bernalillo County (National Center for Education Statistics, 2020, 2021). The average student teacher ratio in the county was 13.5 students per teacher.

Table 3.13-5 Public and Private Schools in the Region of Influence

School Type	Number of Schools	Number of Students	Number of Teachers	Student Teacher Ratio
Public	203	91,323	6,628.3	13.8
Private	45	7,664	691.9	11.1
Total	248	98,987	7,320.2	13.5

Note: Public School data is from the 2020–2021 school year and Private School data is from the 2019–2020 school year.
Source: National Center for Education Statistics, 2020, 2021.

3.13.2.5 Kirtland AFB

During FY 2020, more than 23,000 individuals were employed by Kirtland AFB, of which 3,505 were active-duty personnel. Direct payroll expenditures from the installation totaled $2.26 billion. When non-payroll expenditures associated with Kirtland AFB and local job creation value are included, total economic impact exceeded $7.4 billion, with local economic impact representing approximately $4.6 billion of that total (Kirtland AFB, 2020e).

3.13.3 Environmental Consequences

3.13.3.1 Proposed Action

Population. During construction of the Proposed Action, the increased demand for construction workers could lead to a temporary increase in the area's population. However, the population increase would be minor as the local workforce would support much of the construction activity. Population changes are considered neither adverse nor beneficial as a larger population may increase demands on public services, but they may bring in additional tax revenues that offset service costs.

During operation of the Proposed Action, approximately 390 FTU personnel would be newly stationed at Kirtland AFB year-round and an additional 22 BOS personnel would be based there. In the most extreme scenario, all 412 personnel would come from outside the ROI and would bring a family. According to the DoD *Demographics Profile of the Military Community*, active-duty USAF personnel have an average of 1.2 family members, so if each of the 412 personnel moved to the ROI with their family, the total population increase would be 906, which is 0.1 percent of the population of Bernalillo County (DoD, 2020). Additional temporary population changes would occur due to students visiting the installation.

Employment and Earnings. Construction activities would temporarily support employment in the ROI through the direct hiring of construction workers and through jobs created in supporting industries due to construction spending on supplies and materials in the ROI. The hiring of local workers and the wages paid to workers in the ROI would be a temporary beneficial impact.

During operation of the Proposed Action, 412 permanent jobs would be created in the ROI from the FTU and BOS personnel positions. While many of the personnel would come from outside the ROI, once they settle in the ROI, their wages would stimulate and benefit the local economy. An estimated 270 students would visit the installation per year for training. Visitors would spend money on food, lodging, and transportation which would further stimulate and benefit the local economy.

Housing. Many construction workers that would be hired for the Proposed Action would come from the local workforce; however, if construction workers from outside the ROI move to the area in search of jobs, there would be some increased demand for housing. Bernalillo County has a large supply of vacant housing units (22,583) and the rental vacancy rate is above the national average (see **Table 3.13-4**). This would be a negligible temporary impact.

During operation of the Proposed Action, the 412 new permanent employees would stimulate the local housing market and increase demand for renting and purchasing homes. If all 412 employees moved from outside the ROI and needed new housing this would represent 0.1 percent of the total housing units in Bernalillo County and would have a negligible impact on housing availability and affordability.

Schools. The temporary increase in construction employment created by the Proposed Action could potentially induce non-local workers to move to the ROI. If those workers bring their school-aged children, this increased enrollment could impact schools. Impacts are expected to be minor as the local construction industry would be able to support most of the required workforce.

The 412 new permanent employees that would be required during operations would likely come from outside the ROI and their children would be additions to the local school enrollment. According to the DoD *Demographics Profile of the Military Community*, 61.4 percent of the average 1.2 family members are children (DoD, 2020). This would lead to roughly 0.74 children per employee which would total 305 children. If all the children were school age, this would represent a 0.3 percent increase in the number of students in Bernalillo County which would be a minor impact.

Kirtland AFB. Construction expenditures related to the Proposed Action would increase Kirtland AFB's economic impact in the local area and ROI. During operation of the Proposed Action, additional employment, wages, and local spending would further increase Kirtland AFB's impact on the local economy. These impacts would be minor beneficial impacts.

3.13.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not relocate the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.13.2** would continue. Therefore, implementation of the No Action Alternative would not result in any new or additional impacts on socioeconomics.

3.14 ENVIRONMENTAL JUSTICE AND SENSITIVE RECEPTORS

3.14.1 Regulatory Setting

USEPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (USEPA, 2022). This environmental justice analysis seeks to determine if federal actions will have disproportionate human health or environmental impacts on low-income or minority populations.

An additional analysis of sensitive receptors seeks to identify potential environmental health and safety impacts that may disproportionately affect children or the elderly, as their physiological and behavioral traits may render them more susceptible to certain environmental health and safety risks.

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* require that all federal agencies address the effects of policies on minorities, low-income populations, and children.

3.14.2 Affected Environment

For the purpose of this analysis, the environmental justice ROI includes the areas near Kirtland AFB within which potential impacts from the Proposed Action on minority, low-income, child, and elderly populations could occur. The proposed activities most likely to disproportionately affect environmental justice populations and affect sensitive receptor populations would be exposure to increased noise and traffic during construction or exposure to increased noise from aircraft operations. Therefore, the ROI for environmental justice and sensitive receptors includes the U.S. Census block groups that are within 0.5 mile of the proposed construction projects and the Census block groups around Kirtland AFB that experience noise levels of 65 dB DNL (**Table 3.14-1**). Census block groups are statistical divisions of census tracts, which typically have between 600 and 3,000 people and are the smallest geographical unit for which the USCB publishes sample data. A block group is considered to be a minority area if 50 percent or more of its population is American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic, or if the percentage of the minority population is meaningfully greater than the minority population percentage in the general population or reference area (CEQ, 1997). For this analysis, the reference area is Bernalillo County. Using the low-income threshold criteria analysis, a Census block group is considered to be a low-income area if the percentage of households with incomes below the poverty line is greater than the reference area of Bernalillo County (**Table 3.14-1**). **Figure 3.14-1** shows the minority and low-income block groups in Bernalillo County.

Of the 14 block groups in the ROI, 11 are minority areas and 8 are low-income areas. Seven of the block groups are both a minority area and a low-income area. The ROI as a whole, has a higher percentage of minority residents and low-income residents than Bernalillo County.

The environmental justice analysis reviews impacts described in the other resource sections to determine their potential to impact minority or low-income populations. Primary impacts would occur within the described ROI; however, because the different resources have different areas of potential affect, the ROI may be different depending on the resource analyzed and the impact type.

Locations where sensitive receptors are likely to be present in concentrated numbers are identified for both children and the elderly. Schools and childcare facilities are identified as locations where children are likely to be present and may be vulnerable to impacts. Hospitals and elderly care facilities are identified as locations where the elderly are likely to be present and may be vulnerable to impacts.

Table 3.14-1 Minority and Low-income Populations in the Region of Influence

Geographic Area	Total Population	Percent Minority	Minority Area?	Total Households	Percent of Households Below the Poverty Level	Low-Income Area?
New Mexico	***2,097,021***	***63.3%***	***NA***	***792,755***	***17.8%***	***NA***
Bernalillo County (Reference Area)	***679,037***	***62.2%***	***NA***	***272,528***	***15.7%***	***NA***
ROI Total (All Block Groups)	**19,110**	**69.4%**	**Yes**	**7,152**	**18.9%**	**Yes**
Census Tract 9.04, Block Group 2	2,419	62.8%	Yes	993	16.7%	Yes
Census Tract 9.06, Block Group 1	1,470	62.4%	Yes	775	41.0%	Yes
Census Tract 9.06, Block Group 3	560	63.8%	Yes	195	37.9%	Yes
Census Tract 11.01, Block Group 1	1,859	53.6%	Yes	803	11.3%	No
Census Tract 11.01, Block Group 3	2,236	47.3%	No	983	9.8%	No
Census Tract 12.02, Block Group 1	921	89.9%	Yes	432	9.0%	No
Census Tract 13, Block Group 4	1,447	89.4%	Yes	506	24.7%	Yes
Census Tract 40.01, Block Group 1	745	73.8%	Yes	174	0.0%	No
Census Tract 40.01, Block Group 2	1,766	84.1%	Yes	590	26.3%	Yes
Census Tract 40.01, Block Group 4	1,652	83.1%	Yes	588	19.0%	Yes
Census Tract 45.01, Block Group 1	2,220	92.8%	Yes	651	24.9%	Yes
Census Tract 9800, Block Group 1	786	43.3%	No	298	0.0%	No
Census Tract 9800, Block Group 2	275	33.5%	No	106	16.0%	Yes
Census Tract 9800, Block Group 4	754	51.1%	Yes	58	0.0%	No

Note: NA = Not applicable.
Sources: USCB 2020d, 2020e.

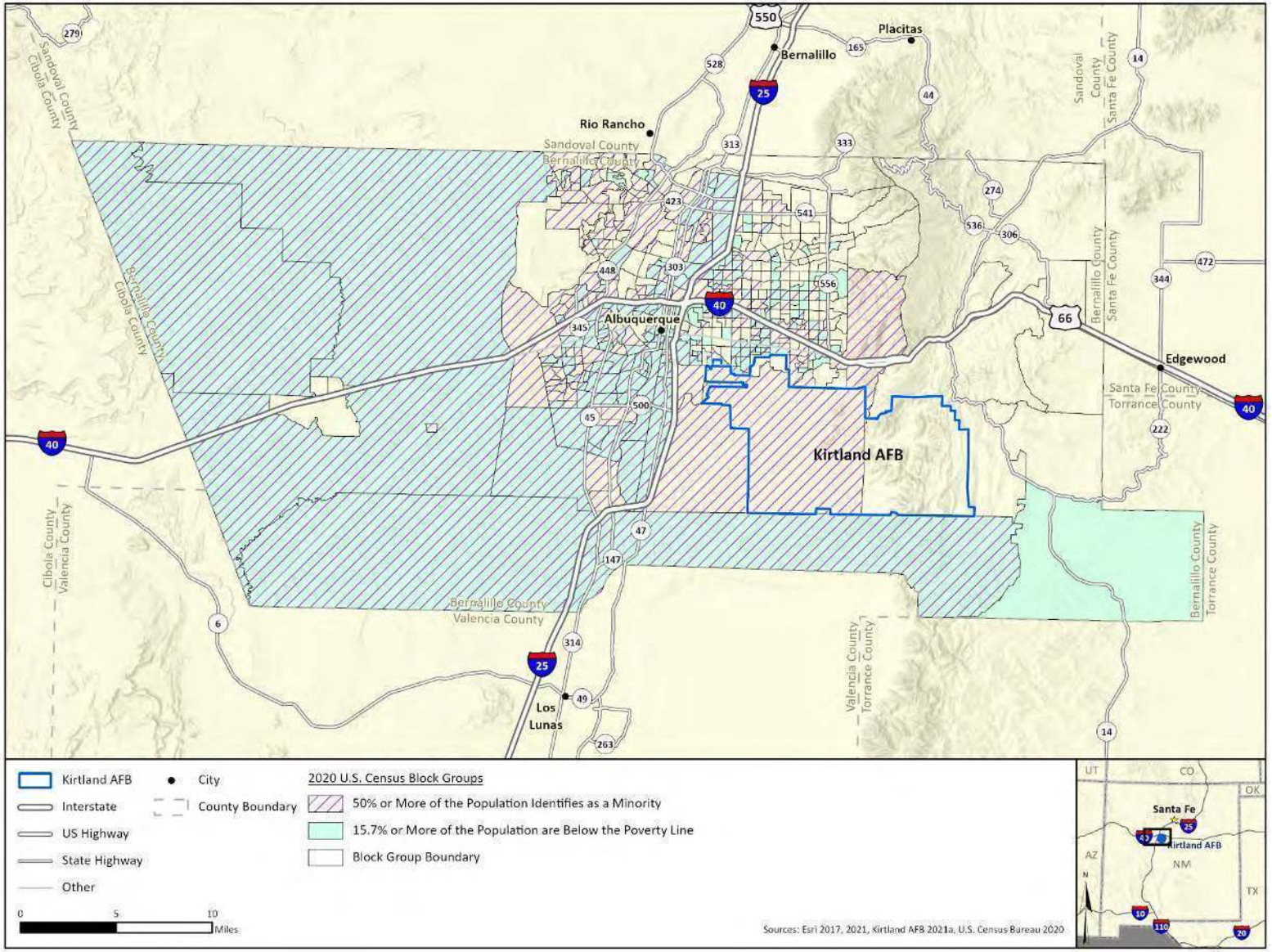

Figure 3.14-1 Minority and Low-income Areas in Bernalillo County

3.14.3 Environmental Consequences

3.14.3.1 Proposed Action

For the purposes of analysis of environmental justice populations in this EA, the race, ethnicity, and poverty characteristics of the ROI are examined to determine if a minority or low-income population could be disproportionately affected by the potential impacts of the Proposed Action. The potential for disproportionate impacts on minority and low-income populations are determined by comparing the percentage of each population in the ROI with the percentage of each population in the community of comparison. If the percentage of minority or low-income population within the ROI is greater than or equal to the percentages for the community of comparison, then disproportionate impacts on that population could be present if the Proposed Action has a potential to substantially impact that population. However, if the percentage of minority or low-income population within the ROI is less than the percentages for the community of comparison, there would likely be no disproportionate impacts (USAF, 2014).

For all child and elderly populations, disproportionate impacts are inherent. Child and elderly populations could be disproportionally impacted to a greater extent because of their vulnerabilities from age-related physiological differences in types and levels of exposure and, therefore, the evaluation of environmental impacts on these populations is different from the evaluation of the general environmental impacts on adults and other populations.

With respect to environmental justice populations, the proposed construction and modification of facilities would generate short- and long-term, minor noise and traffic that could be experienced by people within the ROI. As discussed in **Section 3.3**, construction noise impacts would be temporary lasting only the length of construction and during daytime hours. There would be a temporary increase in traffic on roadways near the project area during construction; however, construction traffic is not expected to occur during peak travel times and roadways would remain open during construction activities. Additionally, early coordination would ensure necessary safety precautions are taken and nearby residents, commuters, and installation personnel have been notified of the construction. Therefore, while the short-term noise and traffic impacts on the minority and low-income populations would be considered disproportionate, the impacts would not be significant.

During operation of the Proposed Action, aircraft noise levels around Kirtland AFB would increase as a result of the estimated 3.5 percent increase in airfield operations. **Figure 3.14-2** shows current and proposed noise contours in relation to minority and low-income populations and other sensitive receptors in the ROI. As described in **Section 3.3,** noise levels would not increase more than 1 dB DNL for any of the identified POIs and any adverse impacts would be less than significant. Impacts in training airspace and at ranges are expected to fall below levels analyzed in previous NEPA documents.

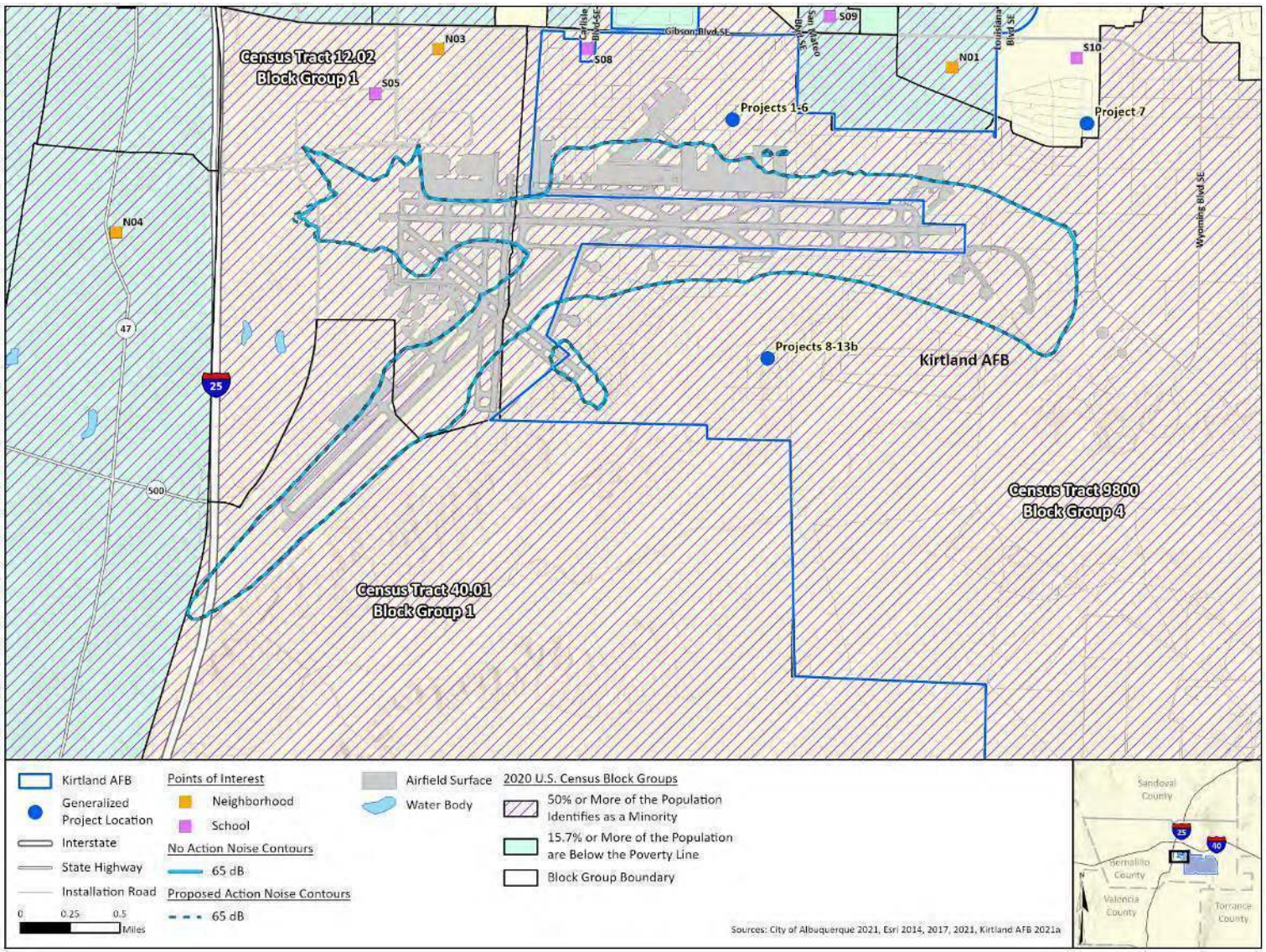

Figure 3.14-2 Current and Proposed Noise Contours in Relation to Minority and Low-income Populations and Sensitive Receptors

Wherry Elementary is located to the north of Project 7 and Kirtland Elementary is located northwest of Projects 1 through 6. Standard construction safety BMPs (e.g., fencing and other security measures) would reduce potential risks to surrounding populations to minimal levels and any potential impacts on children would be short term and negligible because of these BMPs and the distance between the project areas and the schools. Although the Proposed Action would have short-term, adverse noise impacts, the impact on children would not be disproportionate or significant because the effect from additional noise and traffic would be negligible and would not be an environmental health or safety risk. No long-term impacts would be expected on Wherry Elementary, Kirtland Elementary, or other sensitive receptor locations identified in **Section 3.3.** Therefore, the Proposed Action would not result in increased exposure of children to environmental health risks or safety risks. No disproportionate impacts on elderly persons would be expected.

3.14.3.2 No Action Alternative

Under the No Action Alternative, the USAF would not relocate the AFSOC AC-130J FTU from Hurlburt Field to Kirtland AFB, as described in **Section 2.4.1**, and the existing conditions discussed in **Section 3.14.2** would continue. Therefore, implementation of the No Action Alternative would not result in any new or additional impacts on environmental justice or sensitive receptors.

4 REASONABLY FORESEEABLE ACTIONS AND CUMULATIVE IMPACTS

According to CEQ regulations, the cumulative effects analysis of an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects may occur when there is a relationship between a Proposed Action or alternative and other actions expected to occur in a similar location or during a similar timeframe. The effects may then be incremental and may result in cumulative impacts. Actions overlapping with or in close proximity to the Proposed Action or alternatives can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide in the same timeframe tend to offer a higher potential for cumulative effects.

This EA addresses cumulative impacts to assess the incremental contribution of the alternatives to impacts on affected resources from all factors. The USAF has made an effort to identify actions on or near the affected areas that are under consideration and in the planning stage at this time. These actions are included in the cumulative effects analysis, drawn from the level of detail that exists now. Although the level of detail available for those future actions varies, this approach provides the decision-maker with the most current information to evaluate the consequences of the Proposed Action Alternatives.

4.1 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

In this section, an effort was made to identify past and present actions in the region and those reasonably foreseeable actions that are in the planning phase at this time. Actions that have a potential to interact with the Proposed Action at Kirtland AFB are included in this cumulative analysis. This approach enables decision-makers to have the most current information available so that they can evaluate the environmental consequences of the FTU relocation at Kirtland AFB and training in associated SUA.

Kirtland AFB is an active military installation that undergoes changes in mission and in training requirements in response to defense policies, current threats, and tactical and technological advances. The installation, like any other major institution (e.g., university, industrial complex), requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs. In addition, tenant organizations may occupy portions of the installation, conduct aircraft operations, and maintain facilities. All of these actions (i.e., mission changes, facility improvements, and tenant use) will continue regardless of the alternative selected. These projects could have cumulative impacts on resources within the ROI and are listed in **Table 4.1-1**. Other ongoing maintenance and repair activities would occur within the same footprint as current activities (i.e., repairing existing pavements, curbs, sidewalks, and fences; interior building modifications); therefore, they would not introduce any newly disturbed or impervious surfaces and are not included herein.

Table 4.1-1 Current and Reasonably Foreseeable Actions at Kirtland AFB

Project Name	Description	Potential Relevance to Proposed Action
Military Projects		
Zia Park Area Development	Development of a former housing area, called Zia Park, which encompasses approximately 300 acres of land central to the primary cantonment area of the installation. Construction would include administrative buildings, infrastructure improvements, medical facilities, community services, residential lodging, outdoor recreation space, demolition of several facilities that would be redundant with new construction (e.g., gyms, child development center, dormitory, etc.). Construction projects would be either short-term (1–7 years), mid-term (8–16 years), or long-term (17+ years).	A portion of the Proposed Action would occur within the project vicinity. Potential for construction overlap with the Proposed action.
Enhanced Land Use Development	Development of a 90-acre site for mixed-used development that would include office, retail/commercial, multifamily housing, hotel, and restaurant space. Area is on northwestern edge of Kirtland AFB, south of Gibson Boulevard, and west of Truman Gate/Visitors Center. Development will occur between 2019 and 2028.	Not within the project area.
High Powered Electromagnetic Laboratory	Construction of a modern, flexible HPEM laboratory space for development of advanced HPM systems and HEDP research, as operated by the AFRL Directed Energy Directorate, RDH at Kirtland AFB. Construction is anticipated to be complete in 2024.	Not within the project area.
New Military Training Activities	The 210 RHS would construct a permanent laydown yard on the Base Exercise Evaluation and Skills Training Area to store equipment to be used during monthly training activities. Monthly training activities involve the disturbance of up to 40 acres of ground and include the use of the abandoned dirt airstrip to practice demolishing, denying access to, and reconstructing airstrips; construction of forward operating bases to allow other units to train, with 210 RHS tearing them down; and dirt movement for heavy-equipment training. This recurring training could last up to 5 days and involve approximately 120 personnel. The PJ/CRO school is proposing to construct a UTC on 25 acres within the Coyote Canyon Training Area. The UTC would consist of the placement of conexes on a gravel base to simulate a mock village similar to those found in the Middle East. Training activities would include helicopter pararescue and insertion/extraction operations. Other training activities would include small team tactics, climbing, and emergency medical. During training activities at the UTC, personnel would use smokes, ground burst simulators, trip flares, flash-bang pyrotechnics, booby trap simulators, and blanks/simulations. When the UTC is not scheduled for use by PJ/CRO, it would be open for use by other groups; therefore, it is anticipated that the UTC could be used on a monthly basis. The USAF is proposing to begin firing .50-caliber M107 Barrett sniper rifles and M2 machine guns at SAR East. An existing building located south of FR 44 would be demolished in order to provide line-of-sight from the firing point to the target array. Approximately 240 acres would be cleared by tree removal and thinning to create firebreaks along FRs 40, 40B, 530B, and 53. SAR East would continue	Not within the project area.

Project Name	Description	Potential Relevance to Proposed Action
	to be available for training operations and deployment qualification 24 hours a day, 7 days a week. The 377 SFG would begin using the M583A1 parachute illumination round at the M203 Range. This round has a burst height of 500 to 700 feet above ground surface when fired vertically, a candle burn rate of approximately 40 seconds, and an average candlepower of 90,000. The average class using the illumination round would consist of 15 to 30 students, once per month. It is anticipated that an average of 250 to 500 rounds would be dispensed per year. Training would occur during early morning hours, approximately 0300 to 0500, dependent upon coordination with the FAA and air traffic scheduling. Prior to initial use of this round, firebreaks consisting of cleared paths totaling approximately 8 acres would need to be created. The cleared paths would also be used for emergency vehicle access in case of an accidental fire.	
Demolition and Construction of Military Support Facilities	The USAF proposes to demolish and construct, operate, and maintain several military personnel support facilities in the northwestern portion of the installation. The areas include the Visiting Officer Quarters, the Main Enlisted Dormitory Campus, the Noncommissioned Officer Academy, and Dormitory Campus 2. This project would include the demolition of facilities totaling approximately 498,000 SF and construction of facilities totaling approximately 389,000 SF, resulting in a net decrease of approximately 109,000 SF of building space on the installation. Approximately 36 acres would be impacted by construction and demolition activities.	A portion of the Proposed Action would occur within the project vicinity. Potential for construction overlap with the Proposed action.
Construction, Operation, and Maintenance of a New Fire Station	The USAF proposes to construct, operate, and maintain a new Fire Station south of the intersection of Pennsylvania Street and Powerline Road. The proposed structure would be approximately 7,300 SF and one story with three high-bay drive-through apparatus stalls.	Not within the project area.
Development, Testing, Use, and Associated Training at the TEAMS	The Defense Threat Reduction Agency and USAF propose to enhance the testing and training capabilities and use, as well as the functionality of the TEAMS. Specifically, the proposed facilities and activities include a new radiological source storage facility, a mock train station, in-kind replacement of current TEAMS temporary buildings with permanent buildings, and potential increase in testing and training event personnel levels by up to 50 percent. Approximately 2.7 acres would be affected during construction activities.	Not within the project area.
Building Demolition at Kirtland AFB	The USAF is in the process of demolishing 23 buildings totaling approximately 105,000 SF to make space available for future construction and to fulfill its mission as installation host through better site utilization. None of the buildings proposed for demolition are currently occupied or used by installation personnel.	A portion of the Proposed Action would occur within the project vicinity.
Security Forces Complex	The USAF proposes to construct, operate, and maintain a 42,500-SF security forces complex to provide adequate space and modern facilities to house all 377 SFG administrative and support functions in a consolidated location. The 377 SFG functions that would be transferred to the new security forces complex include a base operations center with command and control facility, administration and	A portion of the Proposed Action would occur within the project vicinity.

Project Name	Description	Potential Relevance to Proposed Action
	office space, training rooms, auditorium or assembly room, guard mount, hardened armory for weapons and ammunition storage, confinement facilities, law enforcement, logistics warehouse, general storage, vehicle garage with maintenance area, and associated communications functions. One existing building (879 SF) within the footprint of the security forces complex would be demolished. This project would result in an increase of 41,621 SF of building space on the installation.	
Construct New MWD Facility	The USAF proposes to construct, operate, and maintain a new MWD facility that consists of 14 indoor/outdoor kennels, 4 isolation kennels, storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, totaling 8,000 SF. A parking area with 25 spaces and new access roads would also be constructed as part of the project. Demolition of facilities totaling 2,520 SF would also be included in this project, resulting in a net increase of 5,480 SF of building space on the installation.	Not within the project area.
21st Explosive Ordnance Division Expansion	The 21st Explosive Ordnance Division proposes facility expansion and site improvements for the Weapons of Mass Destruction Company Complex. This unit currently operates from a 90-acre property leased by the United States Army within Kirtland AFB. The current site has seven structures, six of which are substandard and do not have adequate fire protection. The 21st Explosive Ordnance Division proposes to expand this site to a total of 280 acres, add three permanent structures totaling 40,000 SF, demolish five of the six substandard structures (75,000 SF), add two temporary storage containers, tie into nearby utilities, construct water tanks for fire suppression, and construct several concrete pads for training activities. This project would result in a decrease of 35,000 SF of building space on the installation.	A portion of the Proposed Action would occur within the project vicinity.
New Deployable Structures Laboratory	AFRL is proposing to construct a new 4,125-SF high-bay addition to the southeast corner of Building 472. Proposed new construction would include structural pads on columns and trusses for anchoring active gravity off-load support frame; high precision environmental controls (temperature and humidity with low air currents); Gantry crane; and optically diffuse wall coatings for high precision optical motion meteorology system (videogrammetry).	Not within the project area.
High Power Joint Electromagnetic Nonkinetic Strike Laboratory	AFRL is proposing to construct a 5,000-SF addition to Building 332 to include a heavy lab with shielding, a light lab, and office space to support new electromagnetics research.	Not within the project area.
Navigation Technology Satellite Integration Laboratory	AFRL is proposing to construct a 10,000-SF high bay laboratory south of Building 590. The facility would contain office space; Near Field Antenna Range and control room; vault; security vestibule; restrooms; loading dock; and conference, break, storage, comm, and mechanical rooms.	Not within the project area.
Kirtland Exhaust Helium Gas Recovery Facility	AFRL is proposing to construct a 3,700-SF facility between Buildings 580 and 581 to recover helium gas exhaust from experiments occurring within these buildings. The recovered gas would be reliquefied for reuse in the labs.	Not within the project area.

Project Name	Description	Potential Relevance to Proposed Action
Renewable Energy Projects	The USAF proposes to develop renewable energy projects at Kirtland AFB. The proposed project would include the installation of various renewable energy technologies installation-wide, up to a 20-megawatt solar photovoltaic array, and rooftop/carport solar photovoltaic systems.	Not within the project area.
Upgrade, Develop, and Maintain the Storm Drainage System	The USAF proposes to develop, upgrade, and maintain storm drainage systems and conduct arroyo erosion repair and damage avoiding measures across the installation. Storm drainage system activities could include constructing stormwater system upgrades and components including cleaning, regrading, ditching, trenching, trench lining, backfilling, bedding, reinforced concrete pipe, culverts, vegetation, rip-rap, drop inlets, and retention and outlet structures. Arroyo repair activities could include excavating, filling, and lining arroyo banks and constructing and repairing box culverts, bank protection, and grade control structures to assist in stabilizing the arroyo bed towards a stable slope.	Not within the project area.
New Mexico Army National Guard 515th RTI	The New Mexico Army National Guard proposes to relocate their 515th RTI from the Onate Training Complex in Santa Fe to Kirtland AFB. Construction includes a 366,000-SF main campus in the former Zia Park housing area and a 40-acre maneuver and driver's training course with motor pool and classroom near the Tijeras Arroyo Golf Course. The main campus will include an educational facility, billeting, dining facilities, and associated parking	A portion of the Proposed Action would occur within the project vicinity.
Combat Rescue Helicopter Recapitalization	The USAF proposes a one-to-one replacement of the existing HH-60G helicopter fleet at Kirtland AFB with the new HH-60W model. Associated projects include construction of a two-story, 11,000-SF addition to Building 957, and demolition of Building 957 and 960 (8,277 SF) to construct a new 35,973-SF flight simulator facility.	Not within the project area.
Nonmilitary Projects		
Sunport Boulevard Extension	NMDOT has proposed an expansion project for Sunport Boulevard from Broadway Boulevard to I-25, consisting of constructing a four-lane median divided urban arterial roadway. The roadway is approximately 0.5 mile in length and would contain twin bridges over the existing AMAFCA South Diversion Channel and twin bridges over Edmunds Street. Expected to be completed in 2023.	Not within the project area.
South Business Park *(formerly Valle del Sol)*	A proposed 330-acre business park expected to attract manufacturing, fabrication, warehousing, and distribution centers. It would be multimodal to include access to the Sunport and an active rail spur. An additional 200 acres would be reserved for bike trails and walking paths. The site is located south of the Sunport.	Not within the project area.
ABCWUA Water Treatment Facility on Kirtland AFB	To accommodate future growth in Bernalillo County, ABCWUA proposes to construct a wastewater treatment plant on Kirtland AFB. This project is proposed to occur between 2027 and 2037 on approximately 60 acres of land near the western boundary of the installation, south of Tijeras Arroyo.	Not within the project area.

Project Name	Description	Potential Relevance to Proposed Action
Juan Tabo Hills West	Juan Tabo Hills West is Phase 4 of the Voltera Village community and sits on approximately 25 acres near Juan Tabo Boulevard and the Tijeras Arroyo. Phase 4 would consist of 250 single-family lots.	Not within the project area.
Albuquerque International Sunport Projects	The Sunport began the Terminal Improvement Project in February 2017. This project would refurbish and upgrade the ticketing, baggage claim, and exterior areas of the terminal. It was anticipated to take approximately 15 months to complete.; however, the construction time has more than doubled. Development began on Destination Sunport project in March 2017. The project would transform decommissioned Runway 17/35, approximately 80 acres, into space for aviation and aerospace businesses, high tech companies, and retail. The Aviation Center of Excellence is the centerpiece of the development, which also features "The Landing" a 10-acre strip along Gibson Boulevard that will contain retail businesses. Future projects planned for the Sunport over the next 20 years include rehabilitation of various runways, taxiways, and aprons; installation/expansion of aprons and taxiways; removal/closure of taxiways; construction of an Aircraft Rescue Firefighting Facility; removal of the Belly Freight Building; construction of an addition to Concourse B; and construction of a Federal Inspection Services/International Terminal.	Not within the project area.
Valle de Oro Phase II	The USFWS is proposing to conduct restoration, development, and management activities on Valle de Oro National Wildlife Refuge in Bernalillo County. The refuge is 570 acres primarily located between 2nd Street Southwest and the Rio Grande in the South Valley, approximately 3.5 miles southwest of the Sunport and Kirtland AFB. Proposed activities include habitat restoration; construction of a visitor's center, a parking lot, trails, and roads; vegetation and wildlife management; construction and management of AMAFCA stormwater drainage facilities, including a swale and water quality structures; and in partnership with Mid-Rio Grande Conservancy District align the Barr Interior Drain.	Not within the project area.
AMAFCA Louisiana - Gibson Regional Drainage Facility	AMAFCA is constructing a 30-acre-foot drainage facility on Kirtland AFB at the southeast quadrant of the Louisiana/Gibson intersection in order to collect and limit stormwater runoff. Currently, stormwater flow off Kirtland AFB is not controlled and causes damage downstream of the installation, contributing to flooding in the San Pedro/Gibson area. Proposed to begin in the fourth quarter of FY 2018.	Not within the project area.
PERCHAs Project	USFWS, through the Valle de Oro NWR, in cooperation with Bernalillo County, is proposing to develop native habitat areas on County properties within existing County-owned and County-maintained drainage facilities. The County and Valle de Oro NWR are working together to establish forage and habitat areas for wildlife with the goal of linking County properties and the Albuquerque South Valley with the Valle de Oro NWR, so the PERCHAs are viewed as one whole system of habitat areas. There are approximately 15 PERCHA properties on lands owned by the County, but the	Not within the project area.

Project Name	Description	Potential Relevance to Proposed Action
	initial phase of this project focuses on habitat improvements at the following four properties: approximately 8 acres at Los Padillas Community Center, 2 acres at McEwen Pond, 5 acres at Mountain View Community Center, and 14 acres at Sanchez Farms. Habitat improvements include removal of nonnative and invasive vegetation; replanting native wetland and upland grass species; installing songbird and pollinator habitat areas; creating appealing recreation space for Albuquerque residents; increasing existing drainage basins; and installing erosion control measures to include revegetation of slopes. Work at the properties is proposed to begin in June 2019 and continue for approximately 5 years.	
Mesa Del Sol Master Plan	Mesa del Sol is a 12,900-acre, mixed-use master planned community. It is bound by the Sunport along the northwestern edge, Kirtland AFB on the north and east, the Isleta reservation to the south, and I-25 to the west. The community will be built over 40 years and will cover 9,000 of the 12,900 acres. It is proposed to include 3,200 acres for park and open space; 4,400 acres for residential and supporting retail; 413 acres of office space; and 800 acres for schools, including university branches.	Not within the project area.
South I-25 Corridor Study	Corridor Study conducted to identify improvements and enhance the operational performance of I-40/I-25 interchanges from I-25 and NM47/Broadway Boulevard. Improvements include highway widening, construction of acceleration and deceleration lanes as well as ramp-to-ramp auxiliary lanes, and multimodal improvements	Not within the project area.

Notes: 210 RHS = 210th Red Horse Squadron; 377 SFG = 377th Security Forces Group; ABCWUA = Albuquerque Bernalillo County Water Utility Authority; AFB = Air Force Base; AFRL = Air Force Research Laboratory; AMAFCA = Albuquerque Metropolitan Arroyo Flood Control Authority; FAA = Federal Aviation Administration; FR = Forest Road; FY = Fiscal Year; HEDP = High Energy Density Physics; HPEM = High-Powered Electromagnetic; HPM = High-Power Microwave; I- = Interstate; MWD = Military Working Dog; NMDOT = New Mexico Department of Transportation; NWR = National Wildlife Refuge; PERCHA = Prescribed Endemic Refuge Connected Habitat Area; PJ/CRO = Pararescue/Combat Rescue Officer; RDH = High-Powered Electromagnetics Division; RTI = Regional Training Institute; SAR = Small Arms Range; SF = square foot/feet; USAF = United States Air Force; USFWS = United States Fish and Wildlife Service; UTC = Urban Target Complex.

4.2 ASSESSMENT OF CUMULATIVE IMPACT ANALYSIS BY RESOURCE

4.2.1 Airspace Management

At the installation, airfield airspace operations would not be impacted by any reasonably foreseeable actions; therefore, negligible effects would occur when considered along with the Proposed Action. However, this is consistent with designated airspace use; therefore, it is not anticipated that this action would create more than minimal cumulative impacts. Military aircraft would continue to operate under existing flight rules designed to separate aircraft activities, as would the civil aircraft operating to and from the Sunport. Kirtland AFB and FAA positive control and management would continue to guide operations within the airspace. The existing number of operations would increase (approximately two to three sorties per day); however, this small magnitude of impacts would not be significant and would be the same as those described in **Section 3.2.2**, Airspace Management.

4.2.2 Noise

The long-term acoustic environment at Kirtland AFB would not be expected to be influenced by the short-term construction activities described under the Proposed Action or those activities described in **Table 4.1-1** and would continue to be dominated by aircraft operations. Construction activities associated with the Proposed Action would result in a short-term, minor, adverse impact on noise; however, impacts from noise from the construction activities would not be significant since they would only occur during the day between 7:00 a.m. to 5:00 p.m., Monday through Friday. Cumulative impacts from noise as a result of these actions would not be significant.

4.2.3 Land Use

The Proposed Action would result in short-term, negligible, adverse impacts associated with construction activities. Development would not conflict with installation land use or land use in the surrounding area, as described in **Section 3.4.2**. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects on the installation (see **Table 4.1-1**), would not result in significant cumulative impacts to land use but, in fact, would represent an enhancement to the existing area use of land.

4.2.4 Air Quality

Current and reasonably foreseeable projects that may be ongoing in the same timeframe as proposed and alternative actions include the construction in and around the airfield and new military training activities that would occur at Kirtland AFB. Emissions from the cumulative construction and training activities would generally be short-term and limited to the period when those activities are occurring. As Bernalillo County is in attainment for all criteria pollutants, the contribution of the proposed action, in combination with past, present, and future activities, would not result in significant cumulative effects to air quality in the region. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

Emissions of GHGs would increase as a result of the Proposed Action (refer to GHG column in **Table 3.5-2**). Emissions associated with construction would be temporary and cease when the construction is completed. Some small quantities of GHGs may be emitted from stationary sources added to Kirtland AFB as a result of constructing new building (e.g., emergency generators) as well as from worker commutes during operations. The flight operations for the AC-130J are anticipated to be similar to those performed at Hurlburt Field in Florida. For this reason, no net change in GHG emissions from flight operations would occur, as these emissions are global in impact, and would simply transition from the Florida environs to New Mexico. Similar to the Proposed Action, the projects listed in **Table 4.1-1** would generate GHGs and most involve construction, which is of temporary duration. Some long-term benefits may offset the GHGs emitted during construction (for example, energy-efficient buildings or solar generation). While quantification of GHG emissions for all of the cumulative projects is not possible, it can generally be assumed that an overall small increase in GHG emissions, compared to the current levels, may occur for limited timeframes. For the No Action Alternative, there would be no changes in GHG emissions.

Climate change presents a global problem caused by increasing concentrations of GHG emissions. While climate change results from the incremental addition of GHG emissions from millions of individual sources, the significance of an individual source alone is impossible to assess on a global scale beyond the overall need for global GHG emissions reductions to avoid catastrophic global outcomes. Therefore, the quantitative analysis of CO_2e emissions in this EA

is for purposes of disclosing the net increase of GHG emissions from the Proposed Action, which would be additive with those GHGs emitted from the cumulative projects.

4.2.5 Geological Resources

Cumulative impacts to geological resources are not likely to occur with the implementation of the Proposed Action. Soil disturbance would occur during construction of most of the projects listed in **Table 4.1-1**. Large-scale installation projects, as well as off-installation projects, would result in incremental impacts to soils in the region. Present and future projects, including the Proposed Action would implement BMPs to reduce soil erosion and sediment transport as outlined in project-specific SWPPPs. Incremental impacts to soils from the Proposed Action when added to present and future projects would result in adverse cumulative impacts to soils in the regional area; however, those impacts would be less than significant with the implementation of BMPs as stipulated in the project-specific SWPPPs.

4.2.6 Water Resources

The Proposed Action would not result in adverse impacts to water resources. Any potential impacts from stormwater runoff would be managed under a project-specific SWPPP and BMPs. Potable water would be provided from available groundwater supply with sufficient capacity to support the Proposed Action. When added to past, present, and reasonably foreseeable future projects, water demand and use would increase, particularly with a substantial demand from the proposed development projects. These cumulative impacts, however, would not be significant as conservation measures would be put in place during development to reduce impacts to water supplies (low flow faucets and toilets, drip irrigation, xeriscape landscaping). Additionally, cumulative impacts associated with stormwater runoff during construction would be managed under project-specific SWPPPs and construction BMPs.

4.2.7 Biological Resources

Cumulative impacts to biological resources are not likely to occur with the implementation of the Proposed Action. All operations would be required to adhere to the Endangered Species Act and Migratory Bird Treaty Act. Section 7 Endangered Species Act consultation has been, is being, or will be performed where required for each project, and cumulative impacts to federally listed species are addressed as part of that process and documented in appropriate consultations with the USFWS. Where appropriate, mitigation measures would be implemented to minimize the likelihood of cumulative habitat loss for federally listed species, take of individuals, and impacts to birds protected under the Migratory Bird Treaty Act. The impacts of the Proposed Action and those of other demolition and construction projects would be avoided, minimized, and/or compensated to the point that significant cumulative impacts to biological resources would not occur. Therefore, when added to the impacts from other potentially cumulative actions, implementation of the Proposed Action would result in no significant cumulative impacts to biological resources.

4.2.8 Cultural Resources

Cumulative impacts to cultural resources are not likely to occur with the implementation of the Proposed Action. The areas of proposed construction have been previously surveyed and no archaeological resources were found. In the event of an unanticipated discovery during ground-disturbing operations, the following specific actions would occur. The project manager would cease work immediately and the discovery would be reported to the Kirtland AFB Cultural Resources Manager. The Cultural Resources Manager would follow Standard Operating

Procedure 7.4, Cultural Discoveries, as described in the 2018 Kirtland AFB ICRMP (Kirtland AFB, 2018b). No structural damage to NRHP-listed archaeological or architectural resources would be anticipated, and visual intrusion would not cause adverse impacts to the settings of cultural resources underlying the airspace. No traditional cultural properties have been previously identified at Kirtland AFB or the lands underlying the SUA. However, government-to-government consultation is being conducted between Kirtland AFB and the federally recognized Tribal Nations and Pueblos, both in- and out-of-state, which may be historically, culturally, or linguistically affiliated with the area and have an interest in protecting cultural resources located at Kirtland AFB and underlying the SUA. Other ongoing or planned training activities would have a similar minimal impact to cultural resources and have or would be coordinated with the SHPO to ensure protection of these resources. Therefore, cumulative impacts to cultural resources would not be significant under the Proposed Action.

4.2.9 Infrastructure

The Proposed Action would require additional infrastructure for water, wastewater, electricity, natural gas, communications, and solid waste removal. While the proposed development would increase the volume of water, electricity, and natural gas use, these increases would be less than significant as existing regional utility providers have sufficient supply. When added to the Proposed Action, projects listed in **Table 4.1-1** would increase the need for additional infrastructure and utility services, particularly large development projects. The immediate area would benefit from improved utility services; however, there would be an increased demand on utility supplies. Cumulative impacts associated with infrastructure and utility services would be both beneficial and adverse but less than significant.

4.2.10 Hazardous Materials and Wastes

The Proposed Action is not expected to result in significant to impacts associated with the use, handling, transportation, or disposal of hazardous materials or waste. Contractors would comply with standard operating procedures and applicable federal and state laws related to managing hazardous materials and toxic substances. The present and future projects listed in **Table 4.1-1** would generate some hazardous waste during construction; however, the same regulations that would apply to the Proposed Action would be required for these actions. As such, cumulative impacts to hazardous materials and waste management are expected to be less than significant.

4.2.11 Safety

Cumulative impacts to safety resources are not likely to occur under the Proposed Action. Construction related projects under the Proposed Action would be short-term in duration. Any current or foreseeable project listed in **Table 4.1-1** that has a construction component would be coordinated with construction activities occurring under the Proposed Action, as appropriate, to eliminate any potential conflicts. All construction activities under the Proposed Action and projects listed in **Table 4.1-1** adhere to all applicable occupational safety requirements. Any current or foreseeable project with a construction component within the established Q-D arcs would adhere to Air Force Manual 91-201, *Explosive Safety Standards.* Additionally, no current or foreseeable project would create an obstruction to aircraft take-off, landing, or navigation and would therefore not impact aircraft safety.

4.2.12 Socioeconomics

Current and foreseeable projects listed in **Table 4.1-1** include several construction projects as well as projects increasing the permanent employment in the ROI and the increase in visitation

for training activities. The increase in demand for construction may lead to a higher likelihood of requiring workers from outside the ROI which would increase demand for housing. The increased employment and visitation in the ROI would stimulate and benefit the local economy which would offset any increased demand for public services. Together with the Proposed Action, the increased employment and wages in the ROI and increased visitation and spending would be a minor benefit to the ROI.

4.2.13 Environmental Justice and Sensitive Receptors

Current and foreseeable projects listed in **Table 4.1-1** include several construction projects which would temporarily increase noise and traffic in the ROI which consists of disadvantaged communities. Construction and traffic BMPs would reduce impacts where possible and the increase in employment and visitation in the ROI would be beneficial to the local area.

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