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Draft

Environmental Assessment

Addressing Construction and Operation of Re-Entry Vehicle Integration Laboratory Facilities at Kirtland Air Force Base, New Mexico

United States Space Force
Air Force Research Laboratory
United States Air Force
Air Force Global Strike Command

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR THE ENVIRONMENTAL ASSESSMENT ADDRESSING CONSTRUCTION AND OPERATION OF RE-ENTRY VEHICLE INTEGRATION LABORATORY FACILITIES AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code Parts 4321–4347, as amended; implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) Parts 1500–1508; and 32 CFR Part 989, *Environmental Impact Analysis Process*, the United States Air Force (USAF) and the Air Force Research Laboratory (AFRL) of the United State Space Force, a tenant unit at Kirtland Air Force Base (AFB), prepared an Environmental Assessment (EA) to address the construction and operation of Re-entry Vehicle Integration Laboratory (REVIL) facilities for AFRL at Kirtland AFB, New Mexico. The REVIL would include facilities totaling up to approximately 12,000 square feet consisting of an Operating Facility, Radiographic Test Facility, and Storage Facility. The Storage Facility is proposed to be located within the 750 Igloo Area, which is an existing munitions storage area northeast of the proposed Operating and Radiographic Test facilities.

The purpose of the Proposed Action is to achieve USAF weapon systems integrator capability. The REVIL would (1) support the Department of Defense (DOD) and DOE mission partners through weapon system design and integration capabilities; (2) perform design, integration, packaging, and assembly activities on development, qualification, and certification test units; and (3) provide subject matter expertise for assessing weapon system science and technology. The need for the Proposed Action is to (1) establish USAF as an active participant in the development of weapon systems; (2) create an internal research base for USAF weapon skills development; (3) generate informed technical expertise for the Air Force Nuclear Weapons Center and AFGSC nuclear science and technology; and (4) open cross organizational (DOD/DOE) collaboration on weapon system design. AFRL does not have adequate facilities to meet current and future weapon system capabilities in the United States. Because of this, AFRL is undergoing rapid programmatic, funding, and manning increases to meet growing demands for weapon system research, development, test, and evaluation investments.

The EA addressing the construction and operation of REVIL facilities at Kirtland AFB, New Mexico, attached hereto and incorporated herein, analyzes the potential impacts of the project. The EA considers all potential impacts of the Proposed Action and the No Action Alternative. The EA also considers aggregate environmental impacts with other projects in the vicinity of the Proposed Action.

PROPOSED ACTION (EA § 2.1, pages 2-1 to 2-4)

USAF proposes to construct and operate the REVIL to achieve USAF weapon systems integrator capability. This would be accomplished through the construction of two new facilities and the renovation of one storage facility totaling approximately 12,000 square feet on Kirtland AFB. The REVIL would provide the essential capabilities to reconstitute USAF weapon system research capabilities and would consist of an Operating Facility, Radiographic Test Facility, Storage Facility, associated access roads, and a parking area. These new facilities would be constructed according to the latest energy standards for utility conservation and resilience.

The proposed REVIL facilities would be approximately 1,000 feet from the nearest inhabited building. Building construction would comply with minimum intraline and intermagazine distances of 120 and 40 feet, respectively, for the Operating and Radiographic Test facilities and 143 and 48 feet, respectively, for the Storage Facility in the 750 Igloo Area. Stormwater control protocols would be followed both during construction and for long-term maintenance. In addition, most

existing utility lines occur adjacent to the proposed project area; therefore, only connection lines and communication infrastructure would need to be installed. The proposed project area is within a low traffic area and the access roads are in good condition and could handle semi-tractor trailer traffic. Direct access roads to the REVIL facilities and parking areas would be paved under the Proposed Action.

The Operating Facility would total approximately 8,000 square feet and include a 4,800 square foot secure high-bay laboratory for vehicle integration, staging, and tear-down; compartmentalized laboratory spaces for hosting multiple programs concurrently; expansive network capabilities spanning all DOD and DOE classifications; dedicated electronics laboratory for testing/calibration of sensitive components; and be compliant for the handling of high explosives (HEs), radiological material, and beryllium. The high-bay laboratory would contain a 5-ton crane, explosives and hazardous material storage and component integration, radiological material storage and integration (low specific activity [LSA] materials), access-controlled loading docks, and a lightning protection system. Activities occurring at the Operating Facility would include design and development of novel weapon system components and subsystems; integration and assembly of weapon system flight test units, mock-ups, and demolition units; joint DOD/DOE weapon system packaging exercises; and test planning, requirements management, metrology, and instrumentation.

The Radiographic Test Facility would include a 3,000 square foot secure facility designed for assembled pre- and post-test re-entry bodies and would be collocated with the Operating Facility. Activities occurring at the Radiographic Test Facility would include radiographic testing as required to execute weapon system development, certification, and qualification activities, which would uphold safety, assembly integrity, pre- and post-test assembly fidelity, and development of assembly criteria, as well as include additional radiographic testing as required by partnered AFRL programs.

The Storage Facility would be located within the 750 Igloo Area, which is less than 1 mile from the Operating Facility. It would include an 888 square foot secure storage space in Igloo 753 for classified material and be pre-approved for siting/storage of explosive materials. The facility would be constructed 300 feet away from any sensitive receptors as is required. A key feature of the Storage Facility would include external storage necessary for containment of units during extended efforts involving HE materials which in turn would create storage for HE and uphold safety by minimizing the net explosives weight storage in the Operating Facility at any given time. All hazardous materials and wastes would be stored and disposed of in accordance with all federal, state, and local regulations. Igloo 753 would undergo minor renovations. Construction of the REVIL could result in approximately 3.5 acres of ground disturbance, approximately 2.5 acres of new pavement and concrete construction for the access road and parking area, and approximately 11,112 square feet (approximately 0.25 acres) of new building construction. Therefore, the Proposed Action would result in an increase of approximately 2.75 acres of impervious surfaces in the project area.

The REVIL would send and receive materials, components, and subassemblies to and from both DOE and DOD. Hazardous materials that would be handled in the REVIL would include radiological materials, beryllium components, and HEs.

Weapon system components and subsystems would not have fissile materials but would contain LSA accountable materials. In DOE space, this requires a radiological facility. In addition, some weapon system subassemblies could contain beryllium parts. No machining or abrading of beryllium is planned. Finally, there would be no assembly of HE components at the detail HE

level. Assemblies and sub-systems received from DOE or DOD containing HE would be integrated into higher level USAF systems or disassembled after flight tests. Joint Test Assembly/flight test assemblies often contain live detonations. Facility lightning protection system for HE operations would be required. The REVIL would also handle and integrate various hazardous components including but not limited to fire sets, batteries, and low energy electro-explosive devices.

SUMMARY OF FINDINGS

Based on the scope of the Proposed Action, the following environmental resource areas were eliminated from detailed analysis: land use, airspace management, and environmental justice and sensitive receptors **(EA § 3.1.2, pages 3-1 to 3-2)**. Under the Proposed Action, activities would neither result in a change to current land use designations nor changes to current airspace types, flight activities, or training. Furthermore, due to the distance of the project area from off-installation populated areas, no off-installation minority, low income, or youth populations would be adversely impacted by the Proposed Action.

As a result, USAF anticipates no short- or long-term impacts on land use, airspace management, or environmental justice and sensitive receptors at Kirtland AFB. Environmental analyses within the EA focused on the following resource areas:

Noise (EA § 3.2, pages 3-2 to 3-4). The Proposed Action would result in short-term, negligible, adverse impacts on the ambient noise environment. Construction activities associated with the Proposed Action would require the use of heavy equipment, which can cause a temporary increase in noise that is above ambient levels. Several pieces of heavy construction equipment would likely be used simultaneously during the construction period. All construction-related noise impacts would last only for the duration of the construction period and would occur during the daytime hours of 0700 to 1700.

Noise decreases with distance; therefore, increases to the ambient noise environment from construction are typically confined to within 0.5 mile of a project area. All construction activities associated with the Proposed Action would be conducted in an area where aircraft operations, vehicle travel, and industrial activities are typical and where the ambient noise environment is between 65 and 75 A-weighted decibels (dBA). The intermittent, temporary increases in construction noise would negligibly affect the ambient noise levels of the area. To reduce adverse impacts on the ambient noise environment, construction equipment would include noise abatement components such as mufflers, engine enclosures, engine vibration isolators, or other sound dampening supplements, which could reduce the sound level by up to 10 dBA.

The nearest noise sensitive receptors to the project areas are approximately 1 mile north of the proposed storage facility and experience an ambient noise environment from aircraft operations of less than 65 dBA. Additive construction noise levels from that distance would be less than 63 dBA, which would not exceed the ambient noise levels for those sensitive noise receptors. Therefore, construction under the Proposed Action would not be expected to result in significant impacts on sensitive noise receptors or the noise environment.

Operation and maintenance of the new REVIL facilities would result in long-term, negligible, adverse impacts on noise. Daily operation of the REVIL facilities would result in an increase in vehicular traffic from daily personnel commuting to and from the facilities that would produce noise levels at approximately 50 dBA. The facilities would be sited in an area where the ambient noise environment is between 65 and 75 dBA. Increases in vehicular traffic would not be expected to increase the noise environment beyond ambient levels and would not impact any noise sensitive

receptors. Therefore, the Proposed Action would not be expected to result in long-term, significant impacts on sensitive noise receptors or the noise environment.

Air Quality (EA § 3.3, pages 3-4 to 3-8). The Proposed Action would result in a short-term, minor, adverse impact on air quality from construction. Emissions of criteria pollutants and greenhouse gases (GHGs) would be directly produced from activities such as operation of heavy equipment, heavy duty diesel vehicles hauling supplies and debris to and from the project areas, workers commuting daily to and from the project areas in their personal vehicles, and ground disturbance. However, all such emissions would be temporary in nature and produced only when construction activities are occurring, during fiscal years (FYs) 2022 through 2024.

The air pollutant of greatest concern is particulate matter, such as fugitive dust, which would be generated from ground disturbance activities. Fugitive dust air emissions would be greatest during the initial site grading and excavation and would vary daily depending on the work phase, level of activity, and prevailing weather conditions. Particulate matter emissions would also be produced from the combustion of fuels in vehicles and equipment needed for construction.

Long-term, negligible, adverse impacts on air quality would occur from operation of the REVIL facilities. Operational air emissions would be produced from the heating systems at the new facilities, which would likely use natural gas as the fuel source. Air emissions from heating the new facilities would begin following the construction period, beginning in FY 2025. Emissions from the heating systems employed during operation of the REVIL facilities would not increase the installation's potential to emit above major source thresholds, and the capacity of the systems is likely to be low enough that they would not need to be added to the Title V operating permit.

Bernalillo County is designated by United States Environmental Protection Agency as unclassified or in attainment for all criteria pollutants. Therefore, the General Conformity Rule does not apply for the Proposed Action and a conformity applicability analysis is not required. For informational purposes, a 100 tons per year (tpy) *de minimis* level can be used as a surrogate to determine the level of impacts of these pollutants. Under the Proposed Action, annual emissions of all criteria pollutants would be well below the 100 tpy *de minimis* threshold. Therefore, the Proposed Action would not be expected to result in a significant impact on air quality.

Construction of the REVIL facilities would emit approximately 1,200 tons of direct carbon dioxide equivalent (CO_2e) during the construction period (FYs 2022 through 2024). Operation of the REVIL facilities would emit 55.5 tons of direct CO_2e annually in 2025 and later years. By comparison, 1,200 tons of CO_2e is approximately the GHG footprint of 259 passenger vehicles driven for 1 year or 138 homes' energy use for 1 year, and the annual operating air emissions of 55.5 tons of CO_2e is approximately the GHG footprint of 12 passenger vehicles driven for 1 year. Indirect activities associated with the Proposed Action, such as off-site energy production and shipment of equipment and materials, would also produce GHG emissions. However, these emissions would be inconsequential from those currently produced from such activities. Therefore, the Proposed Action's GHG emissions would not meaningfully contribute to the potential impacts of global climate change.

Geological Resources (EA § 3.4, pages 3-8 to 3-11). The Proposed Action would result in short- and long-term impacts to the local topography and soil resources. No impacts to regional geology or geologic hazards are anticipated; therefore, no change to the existing geologic features would occur.

The Proposed Action is expected to result in short-term, minor, adverse impacts on local topography and soil resources due to construction and maintenance activities. These construction

activities would include ground disturbance or excavation to prepare the site for building construction; minor disturbances to soils to access adjacent utilities and construct new communications lines; grading to address surface water runoff during storm events; potential installation of grade control structures; and pavement of access roads and parking lots.

Construction in the project area would result in 3.5 acres of ground disturbance, 2.5 acres of new pavement (i.e., concrete construction for the access road and parking area), and 0.25 acres of new building construction. The construction in the project area would result in the increase of 2.75 acres of impervious surfaces to the existing 3.5 acres of ground disturbance, which would need to be addressed through additional storm drainage infrastructure. Construction activities would also disturb and expose soils, which would increase their susceptibility to water and wind erosion.

Due to changes in storm drainage infrastructure and management and increase in impervious surfaces, there may be gradual alterations in downstream topography due to the slight changes in the direction, rate, and volume of surface water flows. The use of heavy equipment or vehicles for the construction could potentially result in localized soil compaction, altering their normal function relative to water storage, infiltration, or filtration. However, the use of existing paved roads and surfaces throughout construction activities would minimize these soil effects within the project area.

Water Resources (EA § 3.5, pages 3-11 to 3-14). Short-term, negligible to minor, adverse impacts would be expected during construction activities due to ground disturbances from the uses of heavy equipment. These soil disturbances could lead to increased sediment transportation during rainfall events that could eventually enter groundwater through recharge points. Best practices and planning during construction could minimize such impacts by controlling the movement of surface water runoff and ensuring no direct access to groundwater recharge points. Best practices could include using temporary construction of barriers such as fiber logs or silt fences, which would be placed based on site-specific evaluations on an as-needed basis.

Vehicles and equipment used during the Proposed Action could increase the potential for petroleum or hazardous material spills, typically due to leaks or accidents at the work site. Any such leaks or spills could be transported to groundwater either by surface water runoff or by soil leaching. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids. Therefore, implementation of the Proposed Action would not be expected to result in a significant impact on groundwater.

During rainfall events, stormwater has the potential to transport sediment and hazardous materials to drainage ditches. However, implementation of typical stormwater protection best management practices (BMPs) and spill prevention and management plans would reduce or eliminate permanent, adverse impacts on the water quality of surface waters. No permanent bodies of water are located directly in the project area.

No construction sites associated with the Proposed Action would be within the 100-year floodplain; therefore, no impacts on floodplains are anticipated.

Biological Resources (EA § 3.6, pages 3-15 to 3-23). The Proposed Action would result in short-term, negligible to minor, adverse impacts on grassland vegetation. Direct effects on vegetation from removal and crushing and indirect effects from soil compaction and potential for establishment of invasive species would occur. However, long-term, negligible beneficial impacts

would result from revegetation or landscaping of disturbed sites with native species supporting the native plant community on the installation.

Crushing and soil compaction would occur when vehicles and equipment access, park, and maneuver around the project areas during construction and renovation. These impacts would also occur during construction of the associated access road and parking lot and the installation of utility lines and communications infrastructure. Additionally, ground disturbance and transport of construction equipment could increase the potential for establishment of invasive plant species. Adverse impacts on vegetation would be minimized through the use of appropriate BMPs, such as cleaning construction equipment prior to entering the project area.

The Proposed Action would result in intermittent, short-term, minor, adverse impacts on wildlife species and habitat. Renovations to the existing storage facility and installation of utility lines and communications infrastructure would result in temporary, minor degradation of wildlife habitat, while construction of the new facilities, road, and parking lot would result in permanent, minor degradation of habitat. Adherence to BMPs would minimize unnecessary disturbances to habitat. If vegetation establishment occurs, it would be initiated as soon as practical.

Temporary displacement of mobile wildlife from noise, lighting, and other disturbances would occur from construction activities. High-impact maintenance and repair activities that require heavy equipment could cause more-mobile mammals, reptiles, and birds, including breeding migratory birds, to temporarily relocate to nearby similar habitat. This disturbance is expected to be minor and it is assumed that displaced wildlife would return soon after activities conclude. However, in order to avoid nest abandonment and other adverse impact surveys would be conducted prior to the start of construction activities.

Individuals of smaller, less-mobile species could be inadvertently killed or injured during ground-disturbing activities or transportation of equipment and personnel. Burrowing animals, such as burrowing owls, rodents, and reptiles, could be impacted. However, vehicles associated with maintenance and repair activities are used primarily on the established roads, which limits the potential for impacts on burrowing species.

Although there is no evidence of western burrowing owls in the project area, there is the potential for the Proposed Action to result in short-term, minor, adverse impacts to this federal species of concern. As noted above, ground-disturbing activities could indirectly impact the owls and their habitats, and construction would result in both temporary and permanent, minor degradation of habitat. To help mitigate these impacts, Kirtland AFB has developed a burrowing owl management plan with BMPs, including maintaining a 50-meter buffer around occupied burrows, conducting surveys prior to any construction, having a monitor onsite during construction to observe the owls' response to construction and ensure their safety, and adding traffic signage for speeding. Owls should be relocated only as a last report and is the responsibility of the United States Department of Agriculture Animal and Plant Health Inspection Service and the University of Idaho. Surveys take place every year and were last conducted during the 2020 breeding season; no documented observations of burrowing owl or prairie dog colonies have extended into the project area. However, to ensure no impact, an updated species list from the United States Fish and Wildlife Service (USFWS) is required to be obtained within 90 days of starting any construction activities.

There is also potential for the Proposed Action to result in short-term, negligible to minor, adverse impacts on other migratory birds, including gray vireo, loggerhead shrike, and peregrine falcon. However, while habitat in the project area is suitable for these species, it is not exclusive, meaning other habitat could be easily found on Kirtland AFB. As with the burrowing owl, to ensure no

impact, an updated species list from USFWS is required to be obtained within 90 days of starting any construction activities.

During surveys conducted in June 2021, no burrowing owls or threatened and endangered species were observed.

Cultural Resources (EA § 3.7, pages 3-23 to 3-24). The Proposed Action would result in no impacts on known cultural resources. If previously unidentified archaeological deposits are encountered during ground disturbance associated with construction, the procedures outlined in Section 7.2 of the Kirtland AFB Integrated Cultural Resources Management Plan would be followed.

Infrastructure (EA § 3.8, pages 3-25 to 3-28). The Proposed Action would result in short- and long-term impacts on the transportation system. Demolition, construction, and maintenance activities associated with the Proposed Action are expected to result in intermittent, short-term, negligible to minor, adverse impacts on area roadways because of a temporary increase in the number of construction-related vehicles accessing the installation. However, early coordination with Kirtland AFB organizations would ensure necessary safety precautions are taken and would allow ample advance notice to affected commuters and personnel. Typical construction-related traffic would include delivery trucks, haul trucks, and passenger vehicles. Long-term impacts on transportation would include increased traffic within the project area, including commuters and personnel, delivery vehicles (potentially including semi-tractor trailer traffic), and maintenance vehicles. These impacts are anticipated to be negligible.

The Proposed Action is not anticipated to result in any changes to the installation's liquid fuel system, and equipment and construction vehicles would not utilize the installation's fuel supply.

The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on the installation's utility systems. The Proposed Action would require installation of new utility lines to connect the newly constructed facilities to the electrical, natural gas, water supply, sanitary sewer/wastewater, and communications systems. Existing utility lines adjacent to the project area would be used to connect the newly constructed facilities to these utility systems. Interruptions to these utility systems could occur during connection of the newly constructed facilities to the installation's distribution systems.

The net change in the total consumption of electricity and natural gas from operation of the REVIL is expected to be minor. Operation of the REVIL facilities would result in a slight increase in water usage on the installation; however, sufficient water resources would be available on the installation to accommodate the slight increase in newly construction facilities without exceeding capacity. The increase in wastewater generated operation of the facilities would not increase the sanitary sewer and wastewater generation to the maximum allowable limit for the installation. The Proposed Action would potentially need to address both physical and logistical considerations to ensure security and capacity of the communications system is adequate.

The Proposed Action would result in short- and long-term, minor, adverse impacts on stormwater handling at Kirtland AFB. Construction activities would result in adverse impacts on stormwater handling by disruption of natural drainage patterns, contamination of stormwater discharge, and heavy sediment loading. Implementation of BMPs would reduce these impacts.

The increase in impervious surfaces would result in long-term, minor, adverse impacts on stormwater handling. These potential impacts could include increased erosion and sedimentation and changes in downstream direction and volume of stormwater, which could affect the

topography and soil resources. Implementation of BMPs would reduce these impacts, and the Proposed Action would not be expected to result in a significant impact on the stormwater handling system.

The Proposed Action would result in short- and long-term, minor, adverse impacts on solid waste management at Kirtland AFB. Construction and renovation activities would generate minimal amounts of solid waste, primarily including recyclable and reusable building materials (e.g., concrete, metals). Waste disposal would be conducted in accordance with all federal, state, and local laws and regulations. To reduce the amount of waste disposed of at the landfill, materials that could be recycled or reused would be diverted from landfills to the greatest extent possible.

Solid waste generated during operation of the REVIL would be added to the waste already collected by a contractor and disposed of at the city of Albuquerque's Cerro Colorado Landfill. The facility would participate in the installation's recycling program to reduce the amount of solid waste sent to landfills. The Proposed Action would increase the overall solid waste generated at Kirtland AFB but would not significantly alter the existing waste and recycling streams maintained by the installation.

Hazardous Materials and Wastes (EA § 3.9, pages 3-28 to 3-33). The Proposed Action would result in short-term, negligible, adverse and long-term, negligible to minor, adverse and beneficial impacts on hazardous materials and wastes management. Construction contractors would ensure the handling and storage of any hazardous materials and petroleum products is carried out in compliance with applicable laws and regulations. In accordance with the installation's Hazardous Waste Management Plan (HWMP), these requirements would be written into construction contracts. The use of hazardous materials and petroleum products would result in the generation of hazardous wastes and used petroleum products. 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 specification and drip maps would be placed under parked equipment as needed. All hazardous and petroleum wastes generated would be handled and disposed of in accordance with the installation's HWMP and federal, state, and local regulations. Should unknown, potentially hazardous wastes be discovered or unearthed during construction activities, construction contractors would immediately cease work, contact appropriate installation personnel, and await sampling and analysis results before taking further action. Any unknown wastes determined to be hazardous would be managed or disposed of in accordance with applicable laws and regulations.

Laboratory activities during operation of the REVIL would use hazardous materials, including solvents (e.g., acetone, isopropyl alcohol, etc.) for cleaning components, and equipment and potential hazardous materials associated with 3-D printers. Specific operations would be evaluated and anticipated hazardous materials to be used would be determined by the AFRL Space Vehicles Directorate Unit Environmental Coordinator prior to the start-up of the REVIL facilities. All hazardous materials and petroleum products would be authorized and obtained under the appropriate shop code in the installation's Enterprise Environmental, Safety, and Occupational Health Management Information System. Additionally, components and subsystems received at the REVIL would not contain fissile materials but would contain LSA accountable materials.

Because of its age, Igloo 753 is assumed to contain toxic substances such as asbestos-containing materials (ACMs), lead-based paint (LBP), and polychlorinated biphenyls (PCBs). Prior to renovation, surveys for these substances would be completed, as necessary, by a certified contractor and appropriate measure would be taken to reduce the potential exposure to, and

release of, toxic substances during any required substance removal activities. All ACM-, LBP, and PCB-contaminated debris would be disposed of at a USEPA-approved landfill. Long-term, negligible, beneficial impacts would result from the reduced potential for future human exposure to and reduced amounts of ACMs, LBP, and PCBs to maintain at Kirtland AFB.

No short- or long-term impacts on or from Environmental Restoration Program (ERP) sites are expected to result from the Proposed Action. The proposed construction and renovation areas are not within or immediately adjacent to any active ERP sites; therefore, the Proposed Action is not expected to result in an impact on or from ERP sites.

Safety (EA § 3.10, pages 3-33 to 3-36). Implementation of the Proposed Action would result in short-term and long-term impacts. Short-term, negligible, adverse impacts on the safety of contractors and military personnel would occur. No short- or long-term impacts on the health and safety of the public are expected. While unlikely, negligible to moderate short- and long-term adverse impacts could result from an accident at the Operating Facility in the handling of HEs, radiological material, and beryllium. However, Kirtland AFB has numerous safety protocols in place to prevent and minimize potential impacts.

Construction and renovation activities would slightly increase the health and safety risk to personnel within the project area. The selected construction contractor would be required to develop a comprehensive health and safety plan detailing all potential hazards and site-specific guidance to ensure potential safety risks are minimized. Contractor personnel would be responsible for compliance with applicable federal, state, and local safety regulations and would be educated though daily safety briefings to review upcoming work activities and associated hazards. Only certified contractors would be allowed to perform remediation of toxic substances such as ACM or LBP, would wear appropriate personal protective equipment at all times, and be required to adhere to all federal, state, and local regulations during abatement.

The Proposed Action would result in a short-term, negligible, adverse impact on the health and safety of military personnel that work near the construction and demolition sites, and the potential for moderate short-and long-term adverse impacts in the event of an accident at the Operating Facility. Construction and renovation activities associated with the Proposed Action would comply with all applicable safety requirements and installation-specific protocols and procedures, including appropriately marking potentially hazardous areas and posting warning signs and barriers to limit access to approved construction and oversight personnel only. Once the Operating Facility is operational, there is the possibility of an accident occurring during the storage and handling of HEs, radiological material, and beryllium. Kirtland AFB has safety protocols in place, which include a required 300-foot clear zone around the facility to protect military personnel working outside the facility. For those operating inside the facility, procedures outlined in Air Force Instruction 91-202 would be implemented.

No short- or long-term impacts on the health and safety of the public are expected. Because the construction and operation of the REVIL would occur within the boundaries of Kirtland AFB, an active military installation that is not open to the public, the Proposed Action would not pose a safety risk to the public or off-installation areas. Additional, construction areas would be appropriate delineated and posted with access limited to construction personnel. Upon completion of construction and renovation activities, the REVIL facilities would be secure and include security measures to prevent the public from entering.

Socioeconomics (EA § 3.11, pages 3-36 to 3-38). Construction of the REVIL would result in a short-term, negligible, beneficial impact on socioeconomics. Direct and indirect, beneficial impacts would result from increased payroll tax revenue and the purchase of construction

materials and goods in the area resulting in a beneficial impact on the local economy. The proposed construction activities would only require a small number of construction workers over the anticipated 2-year construction period. Based on 2019 employment data, the construction workforce in the Albuquerque area would be sufficient to support construction activities associated with the Proposed Action. The temporary increase in construction workers at Kirtland AFB would represent a small increase in the total number of persons working on the installation, but no additional facilities (e.g., housing, schools) would be necessary to accommodate the workforce.

Operation of the REVIL would not result in changes in employment and would be confined to the installation. Therefore, operation would not be likely to generate additional local or regional spending and no long-term impacts on socioeconomics are anticipated.

Aggregate Impacts. USAF has concluded that no significant adverse aggregate impacts would result from activities associated with implementation of the Proposed Action when considered with past, present, and reasonably foreseeable future projects at Kirtland AFB or in the vicinity of the Proposed Action.

CONCLUSION

Based on the description of the Proposed Action as set forth in the EA, all activities were found to comply with the criteria or standards of environmental quality and were coordinated with the appropriate federal, state, and local agencies. The attached EA and this FONSI were made available to the public for a 30-day review period. Agencies were coordinated with throughout the EA development process and their comments were incorporated into the analysis of potential environmental impacts performed as part of the EA as appropriate.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and analyses contained in the attached EA, conducted under the provisions of NEPA, CEQ Regulations, and 32 CFR Part 989, I conclude that the Proposed Action would not have a significant environmental impact, either by itself or cumulatively, with other known projects. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact completes the environmental impact analysis process.

JASON F. VATTIONI, Colonel, USAF
Commander

Date

Attachment: *Environmental Assessment Addressing Construction and Operation of Re-Entry Vehicle Integration Laboratory Facilities at Kirtland Air Force Base, New Mexico.*

PRIVACY ADVISORY

This EA is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR Parts 1500-1508), and 32 CFR Part 989, Environmental Impact Analysis Process (EIAP).

The EIAP provides an opportunity for public input on Air Force decision- making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Written comments and inquiries regarding this document should be directed by mail to the NEPA Program Manager, 377 MSG/CEIEC, 2050 Wyoming Boulevard SE, Suite 116, Kirtland AFB NM 87117, or via email to KirtlandNEPA@us.af.mil.

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

COVER SHEET

DRAFT
ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION AND OPERATION OF RE-ENTRY VEHICLE INTEGRATION LABORATORY FACILITIES AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Responsible Agencies: United States Space Force (USSF), Air Force Research Laboratory (AFRL), United States Air Force (USAF), Air Force Global Strike Command

Affected Location: Kirtland Air Force Base (AFB), New Mexico

Report Designation: Draft Environmental Assessment (EA)

Abstract: This EA was developed in compliance with USAF's *Environmental Impact Analysis Process* in support of construction and operation of Re-Entry Vehicle Integration Laboratory (REVIL) facilities for AFRL at Kirtland AFB, New Mexico. AFRL does not have adequate facilities to meet current and future weapon system capabilities in the United States. Because of this, AFRL is undergoing rapid programmatic, funding, and manning increases to meet growing demands for weapon system research, development, test, and evaluation investments.

The REVIL would provide weapon system research; development, test, and evaluation system integration; capabilities for new USAF programs; and leverage existing cross directorate AFRL and Department of Energy (DOE) facilities. It would support Department of Defense (DOD) and DOE mission partners through weapon system design and integration capabilities and perform design, integration, packaging, and assembly activities on development, qualification, and certification test units. The Proposed Action would construct secure facilities totaling up to 12,000 square feet consisting of an Operating Facility, Radiographic Test Facility, and Storage Facility.

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ACRONYMS AND ABBREVIATIONS

377 ABW	377th Air Base Wing
377 MSG/CEIEC	377th Mission Support Group/ Civil Engineering Installation Environmental Compliance
ABCWUA	Albuquerque-Bernalillo County Water Utility Authority
ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
AEHD-AQD	Albuquerque Environmental Health Department Air Quality Division
AFB	Air Force Base
AFGSC	Air Force Global Strike Command
AFR	Albuquerque Fire Rescue
AFRL	Air Force Research Laboratory
APE	area of potential effects
BISON-M	Biota Information System of New Mexico
BMP	best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	carbon monoxide
CO_{2e}	carbon dioxide equivalent
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibel
DNL	day/night sound level
DOD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EESOH-MIS	Enterprise Environmental, Safety, and Occupational Health Management Information System
EIAP	Environmental Impact Analysis Process
EISA	Energy Independence and Security Act
EO	Executive Order
ER	Environmental Restoration
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FY	fiscal year
GHG	greenhouse gas
HE	high explosive
HWMP	Hazardous Waste Management Plan
IAP	Initial Accumulation Point
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
JP	jet propellant
LBP	lead-based paint
L_{eq}	equivalent sound level
LSA	low specific activity
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MMRP	Military Munitions Response Program
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
MSGP	Multi-Sector General Permit
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code

NMCRIS	New Mexico Cultural Resources Information System
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NOA	Notice of Availability
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
OSH	occupational safety and health
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PM_{10}	particulate matter less than or equal to10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PPE	personal protective equipment
REVIL	Re-Entry Vehicle Integration Laboratory
RV	Space Vehicles Directorate
SHPO	State Historic Preservation Officer
SO_x	sulfur dioxides
SPCC	Spill Prevention, Control, and Countermeasures
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethylene
tpy	tons per year
UEC	Unit Environmental Coordinator
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USSF	United States Space Force
UXO	unexploded ordnance
VOC	volatile organic compound

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1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

Kirtland Air Force Base (AFB), located southeast of the city of Albuquerque in New Mexico (see **Figure 1-1**), is home to the 377th Air Base Wing (377 ABW) of the Air Force Global Strike Command (AFGSC). The installation is a center for research, development, and testing of nonconventional weapons, space and missile technology, and laser warfare. The 377 ABW ensures readiness and training of airmen for worldwide duty and prepares personnel to deploy worldwide on a moment's notice. The installation encompasses 51,585 acres, of which 44,052 acres are under USAF control (KAFB 2016).

This Environmental Assessment (EA) supports a proposal by the Air Force Research Laboratory (AFRL) of the United States Space Force (USSF), a tenant unit at Kirtland AFB, to construct and operate Re-entry Vehicle Integration Laboratory (REVIL) facilities at Kirtland AFB (the Proposed Action). This would be accomplished through the construction of two new facilities and the renovation of one storage facility totaling up to 12,000 square feet. The REVIL would consist of an Operating Facility, Radiographic Test Facility, and Storage Facility. The Storage Facility would be located within the 750 Igloo Area, which is an existing munitions storage area northeast of the proposed Operating and Radiographic Test facilities. In addition, because of potential hazards, a 300-foot clear zone would be required around the facility. This 300-foot clear zone is for the storage of explosives only as no fissile materials would be handled. The REVIL would provide research, development, test, evaluation, and system integration; capabilities for new USAF weapon system programs; and leverage existing cross directorate AFRL and Department of Energy (DOE) facilities. Construction of the REVIL is planned for fiscal years (FYs) 2022 through 2024.

1.2 PURPOSE OF THE PROPOSED ACTION

The purpose of the Proposed Action is to achieve USAF weapon systems integrator capability. The REVIL would (1) support the Department of Defense (DOD) and DOE mission partners through weapon system design and integration capabilities; (2) perform design, integration, packaging, and assembly activities on development, qualification, and certification test units; and (3) provide subject matter expertise for assessing weapon system science and technology.

1.3 NEED FOR THE PROPOSED ACTION

The need for the Proposed Action is to (1) establish USAF as an active participant in the development of weapon systems; (2) create an internal research base for USAF weapon skills development; (3) generate informed technical expertise for the Air Force Nuclear Weapons Center and AFGSC nuclear science and technology; and (4) open cross organizational (DOD/DOE) collaboration on weapon system design. AFRL does not have adequate facilities to meet current and future weapon system capabilities in the United States. Because of this, AFRL is undergoing rapid programmatic, funding, and manning increases to meet growing demands for weapon system research, development, test, and evaluation investments.

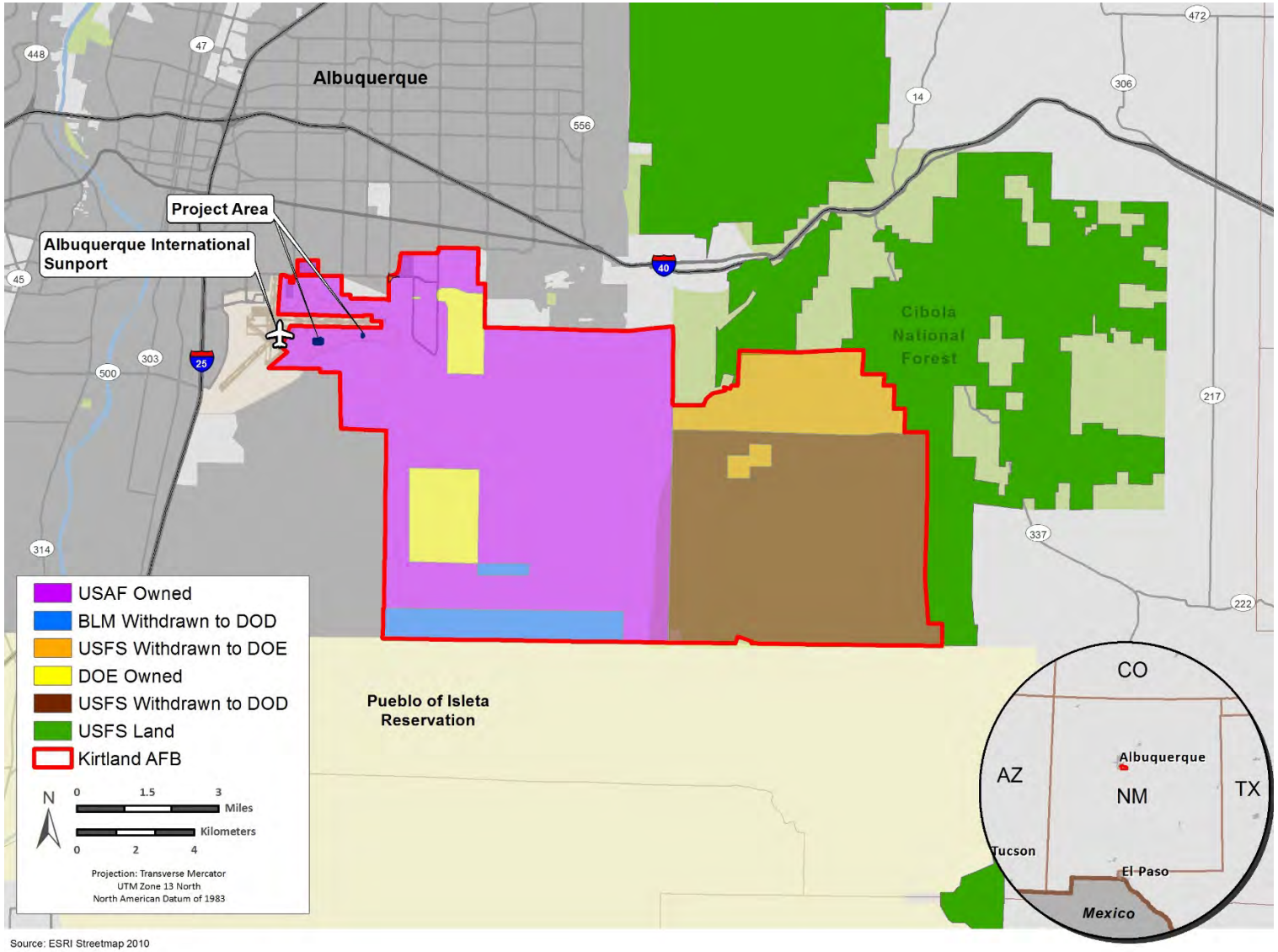

Figure 1-1. Kirtland AFB Vicinity Map with Land Ownership and Withdrawn Areas

1.4 DECISION TO BE MADE

This EA evaluates whether the Proposed Action would result in significant impacts on the human environment. If significant impacts are identified, Kirtland AFB would undertake mitigation to reduce impacts to below the level of significance, undertake the preparation of an Environmental Impact Statement addressing the Proposed Action, or abandon the Proposed Action. The EA is a planning and decision-making tool that will be used to guide Kirtland AFB in implementing the Proposed Action in a manner that complies with all applicable federal, state, and local environmental laws and regulations and is consistent with USAF standards for environmental stewardship. It is prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [USC] 4331 et seq.), the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] 1500–1508), and the Air Force Environmental Impact Analysis Process (EIAP) Regulations at 32 CFR Part 989.

1.5 INTERGOVERNMENTAL COORDINATION / CONSULTATIONS

1.5.1 Interagency and Intergovernmental Coordination and Consultations

Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416, requires federal agencies to provide opportunities for consultation by elected officials of state and local governments that would be directly affected by a federal proposal. In compliance with NEPA, Kirtland AFB notified relevant stakeholders about the Proposed Action and alternatives (see **Appendix A** for all stakeholder coordination materials). The notification process provided these stakeholders the opportunity to cooperate with Kirtland AFB and provide comments on the Proposed Action and alternatives.

Per the requirements of Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations (36 CFR Part 800), Section 7 of the Endangered Species Act (ESA) and implementing regulations (50 CFR Part 17) including the Migratory Bird Treaty Act (MBTA), findings of effect and a request for concurrence were transmitted to the State Historic Preservation Officer (SHPO) and the United States Fish and Wildlife Service (USFWS). A brief summary of comments received is shown below. All correspondence with SHPO and USFWS is included in **Appendix A**.

- ***SHPO (HPD Log 114224).*** The New Mexico SHPO concurred with the finding in the Kirtland AFB cultural resources survey that neither historic properties (buildings or structures) nor archaeological resources are present in the area of potential effects (APE) and concluded that the project would have no adverse effect.

Scoping letters were provided to relevant federal, state, and local agencies. The agencies were requested to provide information regarding impacts of the Proposed Action on the natural environment or other environmental aspects that they feel should be included and considered in the preparation of this EA. During the scoping period, the USAF received response from one government agency, the Department of the Interior, Bureau of Indian Affairs and one state agency, the New Mexico Environment Department (NMED) Hazardous Waste Bureau. A brief summary of concerns and comments for each agency is shown below. All correspondence with federal, state, and local agencies is included in **Appendix A**.

- ***Department of the Interior, Bureau of Indian Affairs.*** The Bureau of Indian Affairs responded that the project would not impact trust resources under their jurisdiction;

therefore, they have no comment. They requested that USAF consult with any local pueblo or tribes regarding Section 106 consultation of the NHPA.

- ***NMED Hazardous Waste Bureau.*** The Hazardous Waste Bureau responded that several Solid Waste Management Units (SWMUs) (ST-288, ST-289, ST-291, and ST-299) are located near the proposed new facilities and NMED does not have a record of receiving either an Investigation Work Plan or an Investigation Report in its Administrative Record for these SWMUs plus several others on the installation. They requested that the installation identify when the documents were submitted or submit the relevant documents by 30 September 2021.

1.5.2 Government to Government Coordination and Consultations

EO 13175, *Consultation and Coordination with Indian Tribal Governments* directs federal agencies to coordinate and consult with Native American tribal governments whose interests may be directly and substantially affected by activities on federally administered lands. To comply with legal mandates, federally recognized tribes that are historically affiliated with the geographic region were invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes (see **Appendix A** for all tribal coordination materials).

Scoping letters were provided to Native American tribes whose ancestors were historically affiliated with the land underlying Kirtland AFB, inviting them to consult on the proposed undertakings outlined within this EA. Additionally, the USAF verbally contacted the Native American tribes to verify they had no additional concerns. During the scoping period, the USAF received two responses. A brief summary of concerns and comments for each tribe is shown below. All correspondence is included in **Appendix A**.

- ***Ysleta del Sur Pueblo.*** The Ysleta del Sur Pueblo responded that they did not have any comments, nor did they request consultation for the Proposed Action.
- ***Navajo Nation.*** The Navajo Nation Heritage and Historic Preservation Department's Traditional Culture Program responded that they have no concerns regarding the Proposed Action and it may proceed without further consultation.

1.6 PUBLIC AND AGENCY REVIEW OF DRAFT EA

A Notice of Availability (NOA) for the Draft EA was published in the *Albuquerque Journal* announcing the availability of the Draft EA. Letters were provided to relevant federal, state, and local agencies and Native American tribal governments informing them that the Draft EA is available for review. The publication of the NOA initiated a 30-day comment period. If open, a copy of the Draft EA will be made available for review at the San Pedro Public Library at 5600 Trumbull Avenue SE, Albuquerque, New Mexico 87108. A copy of the Draft EA is also available for review online at *http://www.kirtland.af.mil* under the Environment Information tab. At the closing of the public review period, applicable comments from the general public and interagency and intergovernmental coordination/consultation will be incorporated into the analysis of potential environmental impacts performed as part of the EA, where applicable, and included in **Appendix A** of the Final EA.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

USAF and AFRL propose to construct and operate the REVIL to satisfy the purpose of and need for the Proposed Action as described in **Sections 1.2** and **1.3**.

2.2 SELECTION STANDARDS

Selection standards were developed to assist USAF in determining reasonable alternatives and the basis for eliminating any of them. The following selection standards were used to determine the feasibility of each alternative and to determine which of the alternatives would be the best fit to meet the needs of the project:

- The site should be secure.
- The site should be 300 feet or greater away from sensitive receptors.
- The site should be within an acceptable distance of the existing explosive storage facility.
- The site should be able to use existing utility lines.
- The site should be easily accessible by vehicle and semi-tractor trailers.
- The site should not have limiting topographic features or stormwater drainage concerns.
- The site should not be within a wetland or floodplain.
- The site must be on lands owned by USAF on Kirtland AFB.
- The site should not be in or adjacent to Accident Potential Zones.
- The site should not be in an area that could have significant adverse impacts on children or minorities.
- The site should not be in an area that would destroy or compromise historic buildings/structures or negatively impact cultural viewsheds.
- Prior to selection, the proposed site would be evaluated to determine if cultural resources exist in the area. If a site is chosen where cultural resources are known to occur and the footprint of the proposed project area cannot be adjusted to avoid impacting the resource, then consultation with the SHPO and applicable Tribal Historic Preservation Officers shall occur, and mitigation measures shall be developed in accordance with Section 106 of the NHPA.
- Prior to selection, the proposed site would be surveyed by a qualified biologist for the presence of habitat for federally and state-protected species, as well as nesting birds protected under the MBTA.
- Prior to selection, the Base Weapons Safety Office should be consulted to ensure that the proposed project area is not impacted by Explosive Safety Quantity Distance Arcs or within explosive danger zones.
- Prior to selection, the site should be inspected for hazardous waste and unexploded ordnance (UXO). Site selection should be coordinated with the Kirtland AFB Environmental Restoration Program (ERP) to avoid siting in areas that contain hazardous waste or UXO.

2.3 DETAILED DESCRIPTION OF THE ALTERNATIVE(S)

2.3.1 Proposed Action (Preferred Alternative)

USAF proposes to construct and operate the REVIL to achieve USAF weapon systems integrator capability. This would be accomplished through the construction of two new facilities and the renovation of one storage facility totaling approximately 12,000 square feet on Kirtland AFB. The REVIL would provide the essential capabilities to reconstitute USAF weapon system research capabilities and would consist of an Operating Facility, Radiographic Test Facility, Storage Facility, associated access roads, and a parking area (see **Figure 2-1**). These new facilities would be constructed according to the latest energy standards for utility conservation and resilience.

The project area for the Operating and Radiographic Test facilities is depicted in **Figure 1-1**. It should be noted that the location of the Radiographic Test Facility may change slightly; however, the entire project area will be analyzed for impacts. At this location, the REVIL facilities would be approximately 1,000 feet from the nearest inhabited building. Building construction would comply with minimum intraline and intermagazine distances of 120 and 40 feet, respectively, for the Operating and Radiographic Test facilities and 143 and 48 feet, respectively, for the Storage Facility in the 750 Igloo Area. Stormwater control protocols would be followed both during construction and for long-term maintenance. In addition, most existing utility lines occur adjacent to the proposed project area; therefore, only connection lines and communication infrastructure would need to be installed. The proposed project area is within a low traffic area and the access roads are in good condition and could handle semi-tractor trailer traffic. Direct access roads to the REVIL facilities and parking areas would be paved under the Proposed Action.

The Operating Facility would total approximately 8,000 square feet and include a 4,800 square foot secure high-bay laboratory for vehicle integration, staging, and tear-down; compartmentalized laboratory spaces for hosting multiple programs concurrently; expansive network capabilities spanning all DOD and DOE classifications; dedicated electronics laboratory for testing/calibration of sensitive components; and be compliant for the handling of high explosives (HEs), radiological material, and beryllium. The high-bay laboratory would contain a 5-ton crane, explosives and hazardous material storage and component integration, radiological material storage and integration (low specific activity [LSA] materials), access-controlled loading docks, and a lightning protection system. Activities occurring at the Operating Facility would include design and development of novel weapon system components and subsystems; integration and assembly of weapon system flight test units, mock-ups, and demolition units; joint DOD/DOE weapon system packaging exercises; and test planning, requirements management, metrology, and instrumentation.

The Radiographic Test Facility would include a 3,000 square foot secure facility designed for assembled pre- and post-test re-entry bodies and would be collocated with the Operating Facility. Activities occurring at the Radiographic Test Facility would include radiographic testing as required to execute weapon system development, certification, and qualification activities, which would uphold safety, assembly integrity, pre- and post-test assembly fidelity, and development of assembly criteria, as well as include additional radiographic testing as required by partnered AFRL programs.

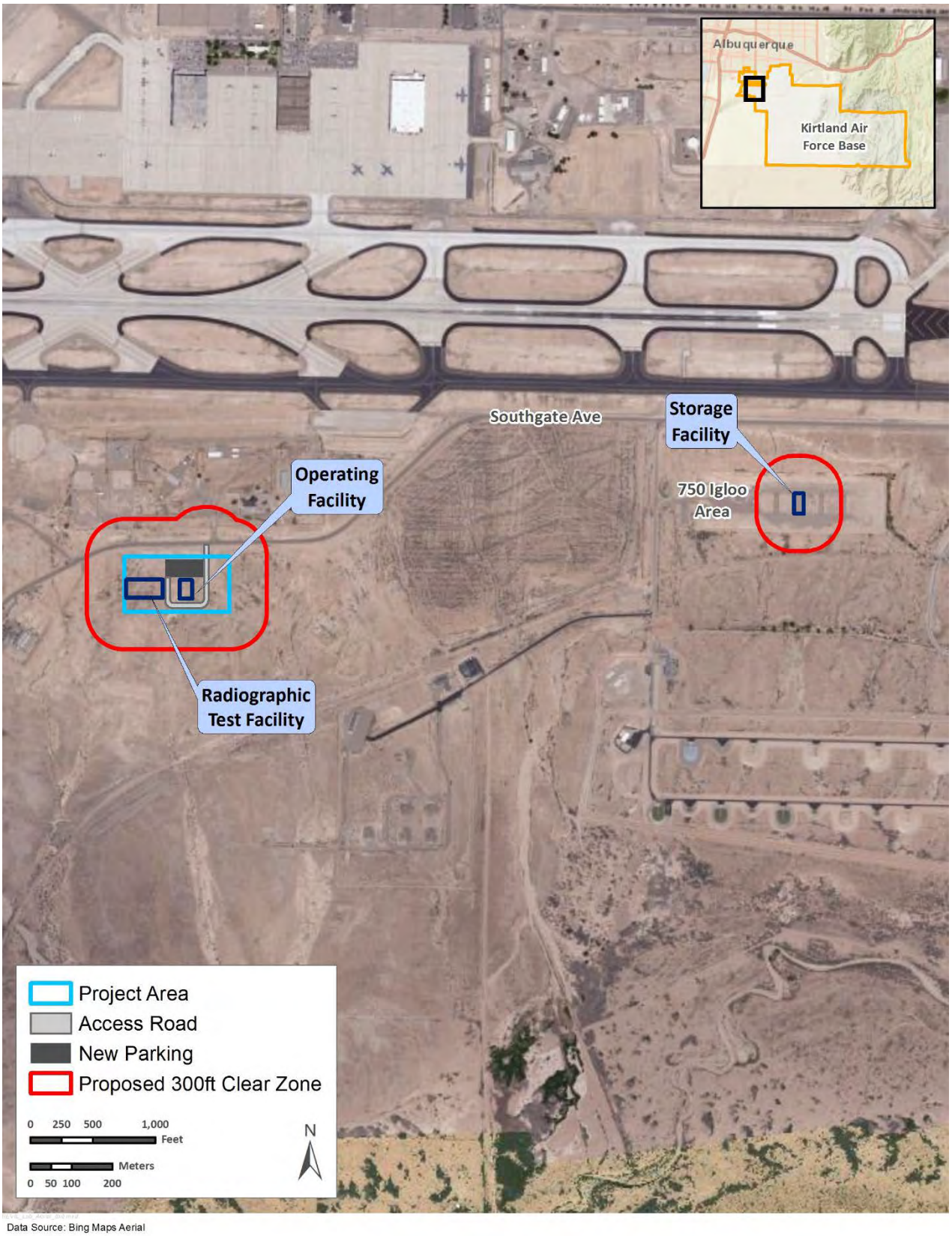

Figure 2-1. Location of the Proposed REVIL Facilities

The Storage Facility would be located within the 750 Igloo Area, which is less than 1 mile from the Operating Facility. It would include an 888 square foot secure storage space in Igloo 753 for classified material and be pre-approved for siting/storage of explosive materials. The facility would be constructed 300 feet away from any sensitive receptors as is required. A key feature of the Storage Facility would include external storage necessary for containment of units during extended efforts involving HE materials which in turn would create storage for HE and uphold safety by minimizing the net explosive weight in the Operating Facility at any given time. All hazardous materials and wastes would be stored and disposed of in accordance with all federal, state, and local regulations. Igloo 753 would undergo minor renovations. Construction of the REVIL could result in approximately 3.5 acres of ground disturbance, approximately 2.5 acres of new pavement and concrete construction for the access road and parking area, and approximately 11,112 square feet (approximately 0.25 acres) of new building construction. Therefore, the Proposed Action would result in an increase of approximately 2.75 acres of impervious surfaces in the project area.

The REVIL would send and receive materials, components, and subassemblies to and from both DOE and DOD. Hazardous materials that would be handled in the REVIL would include radiological materials, beryllium components, and HEs.

Weapon system components and subsystems would not have fissile materials but would contain LSA accountable materials. In DOE space, this requires a radiological facility. In addition, some weapon system subassemblies could contain beryllium parts. No machining or abrading of beryllium is planned. Finally, there would be no assembly of HE components at the detail HE level. Assemblies and sub-systems received from DOE or DOD containing HE would be integrated into higher level USAF systems or disassembled after flight tests. Joint Test Assembly/flight test assemblies often contain live detonations. Facility lightning protection system for HE operations would be required. The REVIL would also handle and integrate various hazardous components including but not limited to fire sets, batteries, and low energy electro-explosive devices.

2.3.2 No Action Alternative

Under the No Action Alternative, the REVIL would not be constructed and AFRL would not achieve USAF weapon systems integrator capability. The No Action Alternative would maintain the current outdated state of AFRL's weapon system design and development capabilities. AFRL would be unable to meet increasing demands for research, development, test, and evaluation investments. Currently, secure laboratories/facilities are not available for data analysis, modeling and simulation, weapon systems integration, and support critical research for deterrence operations.

The No Action Alternative would not meet the purpose of or need for the Proposed Action as described in **Section 1.3**; however, the USAF EIAP (32 CFR § 989.8[d]) requires consideration of the No Action Alternative. Therefore, the No Action Alternative will be carried forward for detailed analysis in the EA.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The following alternatives were eliminated from further consideration based on the selection standards outlined in **Section 2.2** and other reasons as explained below.

2.4.1 Facility Placement Southeast of Golf Course

This alternative would have placed the REVIL approximately 1 mile southeast of the Tijeras Arroyo Golf Course. The access road, Pennsylvania Street, is in good condition to handle semi-

tractor trailers and the location would have direct access to primary transportation corridors for installation entry and exit points. However, this alternative is not being carried forward for detailed analysis because it does not meet some of the selection standards. The location lacks existing explosive storage, with the closest facility being approximately 3 miles from the proposed location. There are also significant concerns regarding its proximity to Pennsylvania Street, a highly traveled road. In addition, neighboring facilities expressed concerns over their collocation with explosives. Proximity to neighboring facilities also causes security concerns. Additionally, capacity of utilities and connection points were less clear at this location.

2.4.2 Facility Placement within Manzano Area

This alternative would have placed the REVIL within the Manzano Area in the central portion of the installation in the foothills of the Manzano Mountains. This location would fall within a low traffic area. The access road is a tertiary road only used by those attempting to access the storage facilities in the Manzano Complex. However, this alternative was not considered because it did not meet some of the selection standards. The closest storage facility is approximately 2.5 miles away. The location provides an indirect, winding route to installation entry and exit points, which is also a concern. There are significant issues regarding utility access with the closest utilities up to 2,000 feet away, which would require a significant investment. In addition, the road used to access the location is not optimal and would need significant repairs to accommodate large vehicles such as semi-tractor trailers. Therefore, this alternative was deemed cost prohibitive.

2.4.3 Facility Placement Near Southern Boundary

This alternative would have placed the REVIL near the southern boundary of the installation. The access road, Lovelace Road, is remote, but is a secondary traffic corridor to the facilities on the southern portion of the installation and has low traffic. However, this alternative was not considered because it did not meet some of the selection standards. There are no nearby options available for explosives storage. Although the condition of the roads could handle large vehicles, they would need to be evaluated to verify this. Proximity to the southernmost installation boundary also poses a security concern because the site is isolated and not near any installation entry or exit points. Combining the extended response time to any security incidents (due to the site location) with weapon system componentry would not meet the needs of the Proposed Action. The location was too distant from existing infrastructure to be considered.

2.5 COMPARATIVE SUMMARY OF IMPACTS

The table below presents a summary of the impacts anticipated under the Proposed Action and No Action Alternative.

Table 2-1. Summary of Potential Impacts

Affected Resource	Proposed Action	No Action Alternative
Noise	Short- and long-term, negligible, adverse impacts would occur. The intermittent, temporary increases in construction noise would negligibly affect the ambient noise levels of the area. To reduce adverse impacts on the ambient noise environment, construction equipment would include use of noise abatement components. Vehicular traffic from daily personnel commuting to and from the REVIL facilities would result in a slight increase in noise. Vehicular traffic would not result in an increase beyond ambient noise levels and would not impact noise sensitive receptors.	Existing conditions would remain unchanged.
Air Quality	Short-term, minor, and long-term, negligible, adverse impacts would occur. Emissions of criteria pollutant and greenhouse gases (GHGs) would be produced during construction; however, such emissions would be temporary in nature. Construction activities would incorporate best management practices (BMPs) and environmental control measures to minimize adverse impacts. Operational air emissions would be produced from the heating systems at the new facilities. Annual emissions of all criteria pollutants would be well below the 100 tons per year (tpy) *de minimis* threshold. GHG emissions would not meaningfully contribute to the potential impacts of global climate change.	Existing conditions would remain unchanged.
Geology and Soils	Short-and long-term impacts on the local topography and soil resources would occur due to construction activities. These construction activities would include ground disturbance or excavation to prepare the site for building construction; minor disturbances to soils to access adjacent utilities and construct new communications limes; grading to address surface water runoff during storm events; potential installation of grade control structures; and pavement of access roads and parking lots. No impacts on or from regional geology or geologic hazards are anticipated, and thus no change to the existing geologic features would occur.	Existing conditions would remain unchanged.

Affected Resource	Proposed Action	No Action Alternative
Water Resources	Short-term, minor, adverse impacts on groundwater and surface water would occur. During rainfall events, stormwater has the potential to transport sediment and hazardous materials to drainage ditches. Contaminants could enter groundwater via surface water runoff or leaching. However, implementation of BMPs and spill prevention and management plans would reduce or eliminate permanent, adverse impacts on the water quality of surface water and groundwater. No permanent bodies of water are within the project area. No floodplains are within the project area, therefore no impacts on floodplains would occur.	Existing conditions would remain unchanged.
Biological Resources	Short-term, negligible to minor, adverse impacts on grassland vegetation would occur. Direct effects on vegetation from removal and crushing and indirect effects from soil compaction and potential for establishment of invasive species would occur. Intermittent, short-term, minor, adverse impacts on wildlife species and habitat would occur. Renovation of the existing storage facility and installation of utility lines and communication infrastructure would result in temporary, minor degradation of wildlife habitat, while construction of the new facilities, road, and parking lot would result in permanent, minor degradation of habitat. Although there is no evidence of western burrowing owls in the project area, there is the potential for the Proposed Action to result in short-term, minor, adverse impacts on this federal species of concern. There is also potential for the Proposed Action to result in short-term, negligible to minor, adverse impacts on other migratory birds, including gray vireo, loggerhead shrike, and peregrine falcon. No impacts to threatened and/or endangered species would be expected as a result of the proposed action.	Existing conditions would remain unchanged.
Cultural Resources	No impacts on known cultural resources would occur. If previously unidentified archaeological deposits are encountered during ground-disturbing activities, procedures outlined in the installation's Integrated Cultural Resources Management Plan (ICRMP) would be followed.	Existing conditions would remain unchanged.
Infrastructure	Short- and long-term impacts are expected to occur on the infrastructure, except for the liquid fuel system. Construction vehicles and equipment are not expected to utilize the liquid fuel system. The activities performed at the REVIL during operation would slightly increase electricity, natural gas, and water utilization and waste generated by Kirtland AFB. Cumulatively, the Proposed Action and subsequent activities would have minor effects on the installation's infrastructure.	Existing conditions would remain unchanged.

Affected Resource	Proposed Action	No Action Alternative
Hazardous Materials and Wastes	Short-term, negligible, adverse and long-term, negligible to minor, adverse and beneficial impacts would occur. Construction contractors would ensure handling and storage of hazardous materials and petroleum products is carried out in compliance with applicable laws and regulations. Should any hazardous materials or petroleum products be released into the environment, adherence to applicable management plans would occur. No hazardous materials or petroleum products are stored within the proposed construction area. During operation of the REVIL, hazardous materials, including solvents for cleaning components and equipment and potential hazardous materials associated with 3-D printers would be used (Montaño 2021). Use of hazardous materials would result in the generation of hazardous and mixed wastes. Specific operations would be evaluated and anticipated hazardous materials to be used and hazardous and mixed wastes to be generated would be determined by AFRL and coordinated with the installation prior to the start-up of the REVIL facilities. Additionally, components and subsystems received at the REVIL would not contain fissile materials but would contain LSA accountable materials.	Existing conditions would remain unchanged.
Safety	Construction activities would result in short-term, negligible, adverse impacts on the safety of contractors, military personnel, and the public. Short-term, negligible, adverse impacts on the health and safety of construction personnel would occur. Short-term, negligible, adverse impacts on the health and safety of military personnel that work near the construction and demolition sites would occur. During operations, there is a potential for moderate short- and long-term adverse impacts in the event of an accident at the Operating Facility. Short-term, negligible, adverse impacts on the health and safety of the public would occur.	Existing conditions would remain unchanged.
Socioeconomics	Short-term, negligible, beneficial impacts would occur. Direct and indirect, beneficial impacts would result from increased payroll tax revenue and the purchase of construction materials and goods in the area. No long-term impacts are anticipated. Operation of REVIL would not result in changes in employment and would be confined to the installation. Operation would not be likely to generate additional local or regional spending.	Existing conditions would remain unchanged. The current outdated state of AFRL's weapon system design and development capabilities would continue, and AFRL would be unable to meet increasing demands for research, development, test, and evaluation investments.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 SCOPE OF THE ANALYSIS

3.1.1 Resources Analyzed

The resources in the project area that were analyzed include noise, air quality, water resources, geology and soils, biological resources, cultural resources, infrastructure, hazardous materials and wastes, safety, and socioeconomics. There are no proposed future projects in the area surrounding that would impact the Proposed Action.

The significance of an action is measured in terms of its context and intensity. The context and intensity of potential environmental impacts are described in terms of duration, the magnitude of the impact, and whether they are adverse or beneficial as summarized below:

- ***Short-term or long-term*.** In general, short-term impacts are those that would occur only with respect to a particular activity, for a finite period, or only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic.
- ***Significant, moderate, minor, negligible, or no impact*.** These relative terms are used to characterize the magnitude or intensity of an impact. Significant impacts are those effects that would result in substantial changes to the environment (as defined by 40 CFR § 1508.27) and should receive the greatest attention in the decision-making process. Less than significant impacts are those that would be slight but detectable.
- ***Adverse or beneficial*.** An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment.

3.1.2 Resources Eliminated from Detailed Analysis

Based on the scope of the Proposed Alternative, environmental resources with few to no impacts were identified and removed from detailed analysis. The following describes those resource areas and why they were eliminated:

- ***Land Use.*** Land use is not addressed in this EA because none of the proposed activities would result in a change in the current land use designations within the Proposed Action area. According to the 2016 Installation Development Plan, the Proposed Action area is located within land designated as the Industrial District and implementation of the Proposed Action would not change this designation (KAFB 2016b). As a result, no short- or long-term impacts are expected on land use at Kirtland AFB. Therefore, land use has been eliminated from detailed analysis in this EA.

- ***Airspace Management.*** Under the Proposed Action, no changes to current airspace types, flight activities, or training would occur. Similarly, the No Action Alternative would not change any current flight patterns for aircraft in the area. The USAF anticipates no short- or long-term impacts on airspace management; therefore, the discussion has been eliminated from detailed analysis in this EA.

- ***Environmental Justice and Sensitive Receptors.*** EO 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations*, and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*,

require that federal agencies address the potential effects of policies of minorities, low-income populations, and children. Because of the distance of the project area from off-installation populated areas, no off-installation minority, low income, or youth populations would be adversely impacted by the Proposed Action, thus they would not experience disproportionately high and adverse impacts. Therefore, environmental justice is not carried forward for detailed analysis.

3.2 NOISE

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Noise can be intermittent or continuous, steady, or impulsive and can involve a number of sources and frequencies. Human responses to similar noise events vary depending on the type and characteristics of the noise, distance between the noise source and the receptor, the time of day, and the noise sensitivity of the individual.

Sound intensity is quantified using decibels (dB), which is a measure of sound pressure level and is used to determine sound intensity. Several factors influence sound propagation including obstacles and climatic conditions. As a rule of thumb, an increase of 10 dB is perceived as twice as loud. A useful general reference is that the just-noticeable difference in sound intensity for the human ear is about 1 dB. Normal conversation at a 3-foot distance is around 60 dB (USEPA 1981). The Occupational Safety and Health Administration (OSHA) allows exposure to 90 dB for up to 8 hours a day, but only 2 hours for 100 dB (OSHA 2008). The National Institute for Occupational Safety and Health has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dB for 8 hours to minimize occupational noise induced hearing loss (NIOSH 1998). A-weighted decibels (dBA) is a unit of measurement in which an "A-weighting" is applied to the dB to approximate a frequency response expressing the perception of sound by the human ear and deemphasize the higher and lower frequencies that the human ear does not perceive well. The average day/night sound level (DNL) metric is a measure of the total community noise environment. DNL is the average sound level over a 24-hour period, in dBA, with a 10 dBA adjustment added to the nighttime levels (between 2200 and 0700 hours). This adjustment is an effort to account for increased human sensitivity to nighttime noise events.

3.2.1 Affected Environment

The ambient noise environment at Kirtland AFB is affected mainly by USAF and civilian aircraft operations, automotive vehicles, and live-fire weapons. In the heavily developed northwestern portion of the installation, the commercial and military aircraft operations at the Albuquerque International Sunport, hereafter referred to as the Sunport, are the primary source of noise. Secondary sources of noise, such as vehicle travel, industrial activities, and military training, also contribute to the louder ambient sound environment in the northwestern portion of the installation compared to other portions of Kirtland AFB. The project area is within the 70 and 65 DNL noise contours for the Sunport, meaning the ambient noise environment from aircraft operations for those areas is between 65 and 75 DNL (Sunport 2018).

Sensitive noise receptors could include specific locations (e.g., schools, housing, hospitals) or an expansive area (e.g., nature preserves, conservation areas, historic preservation districts) in which occasional or persistent sensitivity to noise above ambient levels exist. Most sensitive noise receptors that could potentially be exposed to noise from installation activities are on or proximate to the northwestern and northern portions of Kirtland AFB. For example, several schools, medical centers, hospitals, and residential neighborhoods for the city of Albuquerque as well as all Kirtland AFB housing and community functions are on, within, or proximate to the northern and

northwestern portions of the installation. The one exception is the Pueblo of Isleta, which is located along the southern boundary of the installation. The closest noise sensitive receptors to the project area are the Raymond G. Murphy VA Medical Center and USS Bullhead Memorial Park, which are approximately 1 mile north of the proposed storage facility where minor interior renovations would occur, and approximately 1.3 miles northeast of the main construction area where heavy equipment would be used. The medical center is just outside the 65 DNL noise contour for the Sunport (Sunport 2018).

Because Kirtland AFB and noise-sensitive receptors adjacent to the project area are located in the southern portion of the city of Albuquerque and are exposed to various noise sources, the ambient noise level for the area would be higher than that of a typical suburban or rural area. The typical ambient noise level in an urban area is around 70 dBA but can be as high as 90 dBA depending on nearby noise sources (USEPA 1971).

3.2.2 Environmental Consequences

3.2.2.1 *Proposed Action*

The Proposed Action would result in short-term, negligible, adverse impacts on the ambient noise environment. Construction activities associated with the Proposed Action would require the use of heavy equipment, which can cause a temporary increase in noise that is above ambient levels. Several pieces of heavy construction equipment would likely be used simultaneously during the construction period. **Table 3-1** presents typical additive noise levels for the main phases of construction. In general, the addition of a piece of equipment with identical noise levels to another piece of equipment would add approximately 3 dB to the overall noise environment. Additive noise associated with multiple pieces of construction equipment operating simultaneously would increase the overall noise environment by a few dB over the noisiest equipment, depending on the noise levels (USEPA 1971). All construction-related noise impacts would last only for the duration of the construction period and would occur during the daytime hours of 0700 to 1700.

Table 3-1. Additive Noise Levels Associated with Construction

Construction Phase	L_{eq} (dBA at 50 feet)	L_{eq} (dBA at 250 feet)	L_{eq} (dBA at 500 feet)	L_{eq} (dBA at 1,000 feet)
Ground clearing	84	70	64	58
Excavation and trenching	89	75	69	63
Finishing	84	70	64	58

Sources: USEPA 1971, TRS Audio undated

Notes: Values were estimated assuming an ambient noise environment of 70 dBA. L_{eq} = equivalent sound level, or average sound level of a given event or period of time.

Noise decreases with distance; therefore, increases to the ambient noise environment from construction are typically confined to within 0.5 mile of the project area. All construction activities associated with the Proposed Action would be conducted in an area where aircraft operations, vehicle travel, and industrial activities are typical and where the ambient noise environment is between 65 and 75 dBA. The intermittent, temporary increases in construction noise would negligibly affect the ambient noise levels of the area. At 50 feet from a construction activity, the noise level would not be expected to exceed 90 dBA, which is compliant with OSHA standards. To reduce adverse impacts on the ambient noise environment, construction equipment would include noise abatement components such as mufflers, engine enclosures, engine vibration

isolators, or other sound dampening supplements, which could reduce the sound level by up to 10 dBA.

As noted in **Section 3.2.1**, the nearest noise sensitive receptors to the project area are approximately 1 mile north of the proposed storage facility and experience an ambient noise environment from aircraft operations of less than 65 dBA. According to **Table 3-1**, additive construction noise levels from that distance would be less than 63 dBA, which would not exceed the ambient noise levels for those sensitive noise receptors. Therefore, construction under the Proposed Action would not be expected to result in significant impacts on sensitive noise receptors or the noise environment.

Operation and maintenance of the new REVIL facilities would result in long-term, negligible, adverse impacts on noise. Daily operation of the Operating and Radiographic Test facilities would result in an increase in vehicular traffic from daily personnel commuting to and from the facilities that would produce noise levels at approximately 50 dBA (USEPA 1981). The facilities would be sited in an area where the ambient noise environment is between 65 and 75 dBA. Increases in vehicular traffic would not be expected to increase the noise environment beyond ambient levels and would not impact any noise sensitive receptors. Therefore, the Proposed Action would not be expected to result in long-term, significant impacts on sensitive noise receptors or the noise environment.

3.2.2.2 *Aggregate Impacts*

The Proposed Action would result in short-term, negligible, adverse impacts on the ambient noise environment for the duration of the construction period. No significant change in ambient noise levels from operation of the REVIL facilities would be expected following the construction period. Additional construction activities that coincide with the Proposed Action may contribute to slightly increased noise levels; however, all such occurrences would be temporary in nature and cease upon completion of such construction activities. Additionally, operation and maintenance of the REVIL and other facilities in the vicinity would not result in an increase in the noise environment beyond ambient levels. Therefore, aggregate impacts on the noise environment from the Proposed Action, in conjunction with other actions, would not be significant.

3.2.2.3 *Unavoidable Impacts*

The use of heavy construction equipment, which can cause increased noise levels, is required under the Proposed Action. To reduce adverse impacts on the ambient noise environment, construction equipment would include noise abatement components. Therefore, unavoidable impacts would be negligible.

3.2.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the proposed REVIL facilities would not occur and the existing conditions discussed in **Section 3.2.1** would remain unchanged. No new noise sources would be introduced to the on- and off-installation noise environments; therefore, no noise impacts would occur under the No Action Alternative.

3.3 AIR QUALITY

Air quality is defined by the concentration of various pollutants in the atmosphere at a given location. Under the Clean Air Act, the six pollutants defining air quality, called “criteria pollutants,” include carbon monoxide (CO), sulfur dioxide, nitrogen dioxide, ozone (O_3), lead, and suspended particulate matter (measured less than or equal to 10 microns in diameter [PM_{10}] and less than or

equal to 2.5 microns in diameter [$PM_{2.5}$]). Volatile organic compounds (VOCs) and nitrogen oxide (NO_X) emissions are precursors of O_3 and are used to represent O_3 generation. Lead emissions from common air emissions sources that would be used under the Proposed Action have been negligible since leaded fuels were phased out in the 1970s and 1980s. Therefore, lead is not included in the air quality analysis. The United States Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for criteria pollutants. Areas that are in compliance with the NAAQS or have not been evaluated are designated as attainment, areas that violate an air quality standard are designated as nonattainment, and areas that have transitioned from nonattainment to attainment are designated as maintenance.

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas. A conformity applicability analysis is the first step to General Conformity Rule compliance and assesses if a federal action must be supported by a general conformity determination. If the conformity applicability analysis finds that total direct and indirect emissions of nonattainment and maintenance pollutants (or their precursors) exceed specified thresholds, a general conformity determination is required. The emissions thresholds that trigger requirements for a conformity determination are called *de minimis* levels and are specified at 40 CFR § 93.153. *De minimis* levels (in tpy) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

The NMED Air Quality Bureau oversees programs for permitting the construction and operation of new or modified stationary source air emissions in the state of New Mexico and has delegated authority over air quality in Bernalillo County to the Albuquerque Environmental Health Department Air Quality Division (AEHD-AQD). AEHD-AQD has also promulgated fugitive dust control permits and open burn program requirements in the New Mexico Administrative Code (NMAC).

Climate Change and Greenhouse Gases. Global climate change refers to long-term fluctuations in temperature, precipitation, wind, sea level, and other elements of Earth's climate system. Ways in which the Earth's climate system may be influenced by changes in the concentration of various gases in the atmosphere have been discussed worldwide. Of particular interest, GHGs are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century because of an increase in GHG emissions from human activities. Climate change associated with global warming is predicted to produce negative economic and social consequences across the globe.

In accordance with EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, this EA follows CEQ's August 2016 guidance titled *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. This EA addresses direct and indirect GHG emissions from the Proposed Action and the impacts of ongoing climate change on and from the Proposed Action.

3.3.1 Affected Environment

Kirtland AFB is in Bernalillo County, New Mexico, which is within the Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region (40 CFR § 81.83). Bernalillo County was designated as nonattainment for CO until 1996 when the county was redesignated as maintenance (USEPA 2021). A 20-year CO maintenance plan was implemented in 1996 and ended in June 2016. As of April 2019, Bernalillo County is no longer subject to the 20-year CO maintenance plan and is

designated unclassified or in attainment for all criteria pollutants. As a result, the General Conformity Rule is not applicable for federal actions occurring at Kirtland AFB and a conformity applicability analysis is not required (Rocha 2019).

Kirtland AFB complies with 20.11.42 NMAC Title V Operating Permit #527-RN1, which covers most permitted stationary emission sources on the installation. The installation is considered a synthetic minor source of hazardous air pollutants under Title I, Section 112 of the Clean Air Act. The 2019 Air Emissions Inventory for Kirtland AFB is provided in **Table 3-2**.

Table 3-2. Calendar Year 2019 Air Emissions Inventory for Kirtland AFB

Actual Emissions	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	$PM_{2.5}$ (tpy)	PM_{10} (tpy)
	8.33	26.95	5.04	0.58	0.75	0.75

Source: KAFB 2020
Note: SO_X = sulfur oxides

Climate Change and Greenhouse Gases. Ongoing global climate change has the potential to increase average temperatures and cause more frequent, intense, and prolonged droughts in the southwest United States including New Mexico (Gonzalez et al. 2018). Changes to regional climate patterns could result in regional changes to flooding frequency, vegetation types, vegetation growth rates, wildfire potential, groundwater depth, and potable water availability.

3.3.2 Environmental Consequences

3.3.2.1 *Proposed Action*

The Proposed Action would result in a short-term, minor, adverse impact on air quality from construction. Emissions of criteria pollutants and GHGs would be directly produced from activities such as operation of heavy equipment, heavy duty diesel vehicles hauling supplies and debris to and from the project area, workers commuting daily to and from the project area in their personal vehicles, and ground disturbance. However, all such emissions would be temporary in nature and produced only when construction activities are occurring, during FYs 2022 through 2024.

The air pollutant of greatest concern is particulate matter, such as fugitive dust, which would be generated from ground disturbance activities. Fugitive dust air emissions would be greatest during the initial site grading and excavation and would vary daily depending on the work phase, level of activity, and prevailing weather conditions. Particulate matter emissions would also be produced from the combustion of fuels in vehicles and equipment needed for construction.

Construction activities would incorporate BMPs and environmental control measures (e.g., wetting the ground surface) to minimize fugitive particulate matter air emissions. In addition, work vehicles are assumed to be well maintained and to use diesel particulate filters to reduce particulate matter air emissions. Construction activities would comply with 20.11.20 NMAC, *Fugitive Dust Control*, to minimize the release of fugitive dust. USAF would obtain a fugitive dust control construction permit from AEHD-AQD, which would require USAF to develop a fugitive dust control plan for the project. These BMPs and environmental control measures could reduce uncontrolled particulate matter emissions by approximately 50 percent. Kirtland AFB's existing fugitive dust control programmatic permit for routine heavy equipment activities, Permit No. 8091-P, would provide coverage for future maintenance activities. Per 20.11.20.12 NMAC, the USAF would also use reasonably available fugitive dust control measures during any

construction activity associated with the Proposed Action, whether or not a fugitive dust control permit was required.

The USAF Air Conformity Applicability Model (ACAM) was used to estimate the annual air emissions from construction activities associated with the Proposed Action. **Table 3-3** summarizes the anticipated air emissions from construction activities. **Appendix B** contains the detailed ACAM report.

Table 3-3. Estimated Annual Air Emissions from Construction and Operation Associated with the Proposed Action

Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2e (tpy)
2021 (Construction)	0.715	0.110	0.640	0.002	4.580	0.030	162.4
2022 (Construction)	2.159	0.358	2.288	0.006	9.413	0.089	568.6
2023 (Construction)	0.676	0.128	1.025	0.002	0.024	0.024	234.8
2024 (Construction and Operation)	0.959	0.306	1.331	0.002	0.047	0.047	248.0
2025 and Later (Operation)	0.046	0.003	0.039	<0.001	0.004	0.004	55.5

Notes: All air emissions have been estimated using USAF ACAM v5.0.17b. CO_2e = carbon dioxide equivalent.

Long-term, negligible, adverse impacts on air quality would occur from operation of the Operating Facility and Radiographic Test Facility. Operational air emissions would be produced from the heating systems at the new facilities, which would likely use natural gas as the fuel source. Air emissions from heating the new facilities would begin following the construction period, beginning in FY 2025. Annual operational air emissions were estimated using ACAM and are also summarized in **Table 3-3**. Emissions from the heating systems employed during operation of the REVIL facilities would not increase the installation's potential to emit above major source thresholds, and the capacity of the systems is likely to be low enough that they would not need to be added to the Title V operating permit.

As noted in **Section 3.4.1**, Bernalillo County is designated by USEPA as unclassified or in attainment for all criteria pollutants. Therefore, the General Conformity Rule does not apply for the Proposed Action and a conformity applicability analysis is not required. For informational purposes, a 100 tpy *de minimis* level can be used as a surrogate to determine the level of impacts of these pollutants. Under the Proposed Action, annual emissions of all criteria pollutants would be well below the 100 tpy *de minimis* threshold (see **Table 3-3**). Therefore, the Proposed Action would not be expected to result in a significant impact on air quality.

Climate Change and Greenhouse Gases. Construction of the REVIL facilities would emit approximately 1,200 tons of direct CO_2e during the construction period (FYs 2022 through 2024). Operation of the Operating Facility and Radiographic Test Facility would emit 55.5 tons of direct CO_2e annually in 2025 and later years. By comparison, 1,200 tons of CO_2e is approximately the GHG footprint of 259 passenger vehicles driven for 1 year or 138 homes' energy use for 1 year, and the annual operating air emissions of 55.5 tons of CO_2e is approximately the GHG footprint of 12 passenger vehicles driven for 1 year (USEPA 2020). Indirect activities associated with operation of the REVIL facilities, such as off-site energy production and shipment of equipment and materials, would also produce GHG emissions. However, these indirect activities occur currently and additional indirect air emissions associated with the Proposed Action would be negligible when compared to those currently produced from such activities. Therefore, the

Proposed Action's GHG emissions would not meaningfully contribute to the potential impacts of global climate change.

Ongoing changes to climate patterns in the southwestern United States are described in **Section 3.4.1**. These climate changes are unlikely to affect USAF's ability to implement the Proposed Action. The project area is not within a floodplain. Increased temperature, prolonged drought duration, flooding frequency and intensity, and other results from ongoing global climate change would not affect the Proposed Action, nor would the Proposed Action meaningfully contribute to the occurrence of such events.

3.3.2.2 *Aggregate Impacts*

The Proposed Action would result in short-term, minor, adverse impacts to air quality for the duration of the construction period. No significant change in annual air emissions from operation of the REVIL facilities would be expected following the construction period. Additional construction activities that coincide with the Proposed Action may contribute to slightly increased airborne dust (primarily PM_{10}), however all such occurrences would be temporary in nature and cease upon completion of such construction activities. Emissions from the Proposed Action would not be considered significant for the region. Therefore, aggregate impacts on air quality from the Proposed Action, when combined with other actions, would not be significant.

3.3.2.3 *Unavoidable Impacts*

The use of heavy construction equipment and ground disturbance activities are required to build the proposed facilities. Combustion of fuels, which produce emissions of criteria pollutants, is needed to operate construction equipment, and ground disturbance activities intrinsically produce fugitive dust air emissions. To reduce emissions of criteria pollutants and suppress fugitive dust, construction activities would incorporate BMPs and environmental control measures. These could include employing diesel particulate filters to reduce particulate matter air emissions and wetting the ground surface to reduce fugitive dust emissions. Therefore, unavoidable impacts would be minor.

3.3.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the REVIL facilities would not occur and air quality conditions would remain the same as described in **Section 3.4.1**. Therefore, no air quality impacts would occur.

3.4 GEOLOGICAL RESOURCES

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards. Topography and physiography pertain to the general shape and arrangement of the land surface, including its height and the position of its natural and man-made features. In appropriate cases, soil properties must be examined for their compatibility with construction activities or types of land use.

3.4.1 Affected Environment

Regional Geology. The western portion of Kirtland AFB consists of the Albuquerque basin also known as the Middle Rio Grande. The Rio Grande Rift is comprised of faults and a sediment-filled basin that extends from south-central Colorado, through New Mexico, and into northern Mexico. The project area consists of a segment of the Rio Grande Rift where bedrock is deeply buried

under Santa Fe Group alluvium. Primary sediments surrounding the project area can be described as poorly consolidated alluvial-colluvial (USGS 2003).

Topography and Soils. The overall topography of Kirtland AFB ranges from the mountainous terrains of the Cibola National Forest Withdrawn Area to the east and the relatively flat mesa to the west (where the project area is located). The predominant soils found within the project area are listed in **Table 3-4** (USDA-NRCS 2019).

Table 3-4. Soil Characteristics

Soil Series	Slope	Runoff
Bluepoint Loamy Fine Sand	1 to 9%	Low
Latine Sandy Loam	1 to 5%	Low
Wink Fine Sandy Loam	0 to 5%	Very Low

Generally, all soils at Kirtland AFB are well drained. However, some areas are vulnerable to erosion with topographic relief.

None of the soils within the project area are classified as prime farmland, or farmland of statewide or local importance pursuant to the Farmland Protection Policy Act of 1981. Additionally, Kirtland AFB is not currently utilized for agriculture, nor is any agricultural use planned in the future.

Geological Hazards. More commonly known as the Tijeras fault zone, the Tijeras-Cañoncito fault system consists of several northeast-oriented, sub-vertical faults that form the eastern edge of the Albuquerque Basin. The Tijeras fault zone is part of this regionally extensive group of faults. The southern end of the Tijeras fault zone converges with the southern Sandia and Hubbell Spring fault zones beneath Kirtland AFB near Tijeras Arroyo. Frequent, low magnitude and intensity earthquakes are common occurrences for the Albuquerque region, including Kirtland AFB (USGS 2002).

Accordingly, the United States Geological Survey rates the seismic hazard of this area as “moderate” based on a measurement of expected building damage in an earthquake scenario. Similarly, the International Conference of Building Officials Uniform Building Code classifies the region as having a moderate potential for damage to structures from seismic activity (USGS 2008).

3.4.2 Environmental Consequences

3.4.2.1 *Proposed Action*

The Proposed Action would result in both short- and long-term impacts to the local topography and soil resources. No impacts to regional geology or geologic hazards are anticipated, and thus no change to the existing geologic features. Therefore, regional geology and geologic hazards will not be discussed further.

Topography and Soils. The Proposed Action is expected to result in short-term, minor, adverse impacts on local topography and soil resources due to construction and maintenance activities. These construction activities would include ground disturbance or excavation to prepare the site for building construction; minor disturbances to soils to access adjacent utilities and construct new

communications lines; grading to address surface water runoff during storm events; potential installation of grade control structures; and pavement of access roads and parking lots.

Construction in the project area would result in 3.5 acres of ground disturbance, 2.5 acres of new pavement (i.e., concrete construction for the access road and parking area), and 0.25 acres of new building construction. The construction in the project area would result in the increase of 2.75 acres of impervious surfaces to the existing 3.5 acres of ground disturbance, which would need to be addressed through additional storm drainage infrastructure. Construction activities would also disturb and expose soils, which would increase their susceptibility to water and wind erosion. Because changes in storm drainage infrastructure and management and increase in impervious surfaces, there may be gradual alterations in downstream topography due to the slight changes in the direction, rate, and volume of surface water flows. The use of heavy equipment or vehicles during construction could potentially result in localized soil compaction, altering their normal function relative to water storage, infiltration, or filtration. However, the use of existing paved roads and surfaces during construction would minimize these soil effects within the project area.

The Proposed Action would implement strategies to minimize soil erosion and sedimentation using environmental protection measures and appropriate BMPs. As needed, Kirtland AFB would obtain coverage under the 2017 National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) for projects that individually or cumulatively disturb 1 acre or more of land. The CGP requires the preparation, approval, and implementation of site-specific Stormwater Pollution Prevention Plans (SWPPP) prior to construction, including appropriate structural and non-structural erosion, sediment, and waste control BMPs (USEPA 2017). In accordance with the current CGP, the Kirtland AFB Municipal Separate Storm Sewer System (MS4) Stormwater Management Program, and the Kirtland AFB Multi-Sector General Permit (MSGP) SWPPP, all project activities would be reviewed to ensure proper erosion and sediment control measures area considered and incorporated into project designs.

To comply with local regulations, all project activities that disturb 0.75-acres or more would obtain a fugitive dust control construction permit from Bernalillo County. Each permit would include site-specific BMPs for dust control and suppression, such as watering and the use of soil stabilization agents. With these mitigation activities in place, the Proposed Action would not result in a significant impact on local topography or soils.

3.4.2.2 *Aggregate Impacts*

The Proposed Action would result in short-term, minor, adverse impacts on topography and soils due to construction and maintenance activities. Additionally, the increase in impervious surfaces would potentially affect stormwater drainage, requiring additional infrastructure. Cumulatively, the Proposed Action and subsequent activities would minorly contribute to adverse effects on geological resources.

3.4.2.3 *Unavoidable Adverse Impacts*

Under the Proposed Action, the increase in impervious surfaces in the immediate area would affect stormwater drainage and could potentially affect downstream topography and soils due to slight changes in direction and/or volume of stormwater. These effects are expected to be minimized through compliance with the requirements under EISA Section 438 and EO 13834.

3.4.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the REVIL facilities would not occur and conditions would remain the same as described in **Section 3.4.2**. Therefore, no impacts on geological resources would occur as a result of the No Action Alternative.

3.5 WATER RESOURCES

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. EISA 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.

The Clean Water Act (CWA) establishes federal limits, through the NPDES permit process, for regulating point and non-point discharges of pollutants into the Waters of the United States and quality standards for surface waters. The term "Waters of the United States" has a broad meaning under the CWA and incorporates deep water aquatic habitats and special aquatic habitats (including wetlands).

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. Flood potential is evaluated by Federal Emergency Management Agency, which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year, or a flood event in the area once every 100 years. 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.

3.5.1 Affected Environment

Groundwater. Kirtland AFB is within the limits of the Rio Grande Underground Water Basin. The average depth to groundwater beneath Kirtland AFB 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, Albuquerque Basin 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. In 2020, Kirtland AFB pumped 2,421 acre-feet (789 million gallons) of water from the regional aquifer (KAFB 2021).

***Surface Water*.** Kirtland AFB is within the Rio Grande watershed. The Rio Grande is the major surface hydrologic feature in central New Mexico, flowing north to south through Albuquerque, approximately 5 miles west of the installation. Surface water on the installation typically occurs in the form of stormwater sheet flow that drains into small gullies during heavy rainfall events (KAFB 2018a). 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. Both are tributaries to the Rio Grande. 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. The remaining 5 percent is equally divided between groundwater recharge and runoff (KAFB 2018a, USAF 1991).

During heavy precipitation, stormwater on the installation is collected via a series of storm drains, flood canals, and small arroyos that eventually drain to Tijeras Arroyo or Arroyo del Coyote. In the developed area of the installation, stormwater drains into small culverts towards Gibson Boulevard along the installation boundary. Stormwater in the portion of the installation where the project area is located discharges through surface runoff to three large culverts that drain toward the Tijeras Arroyo on the south (KAFB 2018a).

Wetlands are considered "Waters of the United States" if they are determined to be jurisdictional by the US Army Corps of Engineers and USEPA. There are 10 wetlands supplied by at least 15 naturally occurring springs on Kirtland AFB; however, no Jurisdictional Determinations have been made concerning these water features. There are no natural lakes or rivers on Kirtland AFB; however, six man-made ponds have been created on the Tijeras Arroyo Golf Course.

No wetlands are located within or adjacent to the project area. There are two surface water drainage features located within 300 feet of the project area – one is located west of the proposed Operating and Radiographic Test facilities and one is located north of the Storage Facility (see **Figure 3-1).** Both surface water features are ephemeral and flow only during heavy precipitation events. Kirtland AFB operates under three NPDES Permits: (1) MSGP for industrial activities, (2) MS4 permit for stormwater conveyances from installation development, and (3) 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 (see **Figure 3-1**). Arroyo del Coyote and Tijeras Arroyo floods occur infrequently and are characterized by high peak flows, small volumes, and short durations (KAFB 2018a). The project area is not located within the floodplain. The flood zone associated with the Tijeras Arroyo is approximately 0.6 mile south of the proposed renovation at Igloo 753 and 1 mile south of the proposed Operating and Radiographic Test facilities.

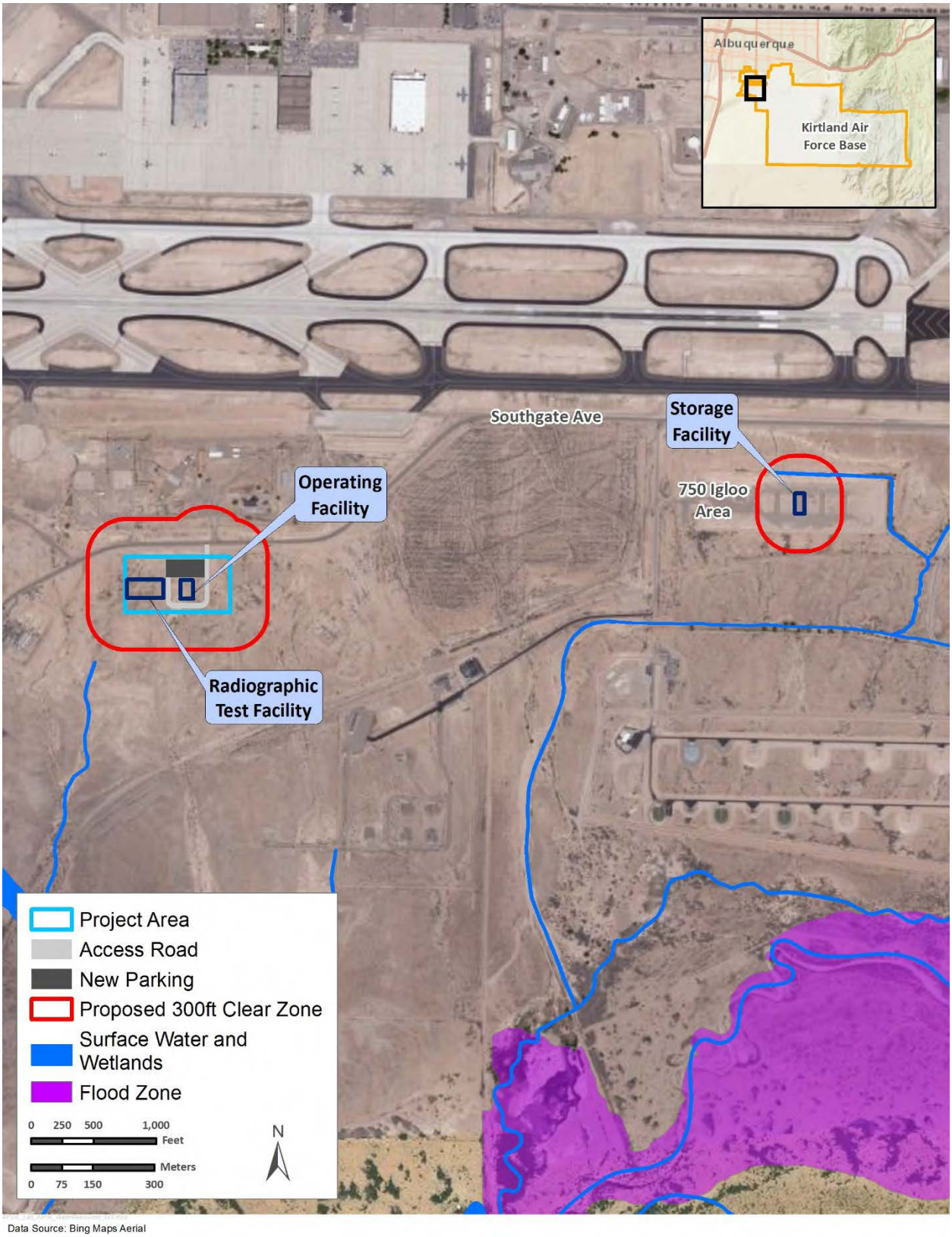

Figure 3-1. Water Resources Near the Project Area

3.5.2 Environmental Consequences

3.5.2.1 *Proposed Action*

***Groundwater*.** Short-term, negligible, adverse impacts would be expected during construction activities due to ground disturbance from the use of heavy equipment. Soil disturbances could lead to increased sediment transportation during rainfall events that could eventually enter groundwater through recharge points. Best practices and planning during construction could minimize such impacts by controlling the movement of surface water runoff and ensuring no direct access to groundwater recharge points. Best practices could include using temporary construction of barriers such as fiber logs or silt fences, which would be placed based on site-specific evaluations on an as-needed basis.

Vehicles and equipment used during the Proposed Action could increase the potential for petroleum or hazardous material spills, typically due to leaks or accidents at the work site. Any such leaks or spills could be transported to groundwater either by surface water runoff or by soil leaching. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids. Therefore, implementation of the Proposed Action would not be expected to result in a significant impact on groundwater.

Surface Water. Short-term, negligible to minor, adverse impacts would be expected during construction of the Proposed Action. During rainfall events, stormwater has the potential to transport sediment and hazardous materials to drainage ditches. However, implementation of typical stormwater protection BMPs and spill prevention and management plans would reduce or eliminate permanent, adverse impacts on the water quality of surface waters. No permanent bodies of water are located directly in the project area.

***Floodplains*. Figure 3-1** shows that no construction sites associated with the Proposed Action would be within the 100-year floodplain; therefore, no impacts on floodplains are anticipated.

3.5.2.2 *Aggregate Impacts*

Short-term, negligible to minor, adverse impacts would be expected on groundwater and surface water during construction activities during implementation of the Proposed Action due to ground disturbances and potential leaks from heavy equipment. Impacts can be minimized through use of BMPs and controls, such as temporary barriers and absorbent pads. Present and future construction projects conducted in the same region would also be held to the same standard with minimal expected impacts. Therefore, the Proposed Action, in conjunction with other foreseeable actions both on and off-base, would not result in significant aggregate impacts to water resources.

3.5.2.3 *Unavoidable Adverse Impacts*

The Proposed Action would require water for dust suppression during construction activities. Although some water use would be unavoidable, impacts on these resources would not be considered appreciable and would not be expected to affect the availability of water resources.

3.5.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the REVIL facilities would not occur and the existing conditions discussed in **Section 3.5.1** would remain unchanged, resulting in no impacts on water resources.

3.6 BIOLOGICAL RESOURCES

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 New Mexico Department of Game and Fish (NMDGF). Federal species of concern are not protected by the ESA; however, these species could become listed, and therefore are given consideration when addressing biological resource impacts of an action. Avian species are subject to the MBTA.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the ESA 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).

3.6.1 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. Elevation within the approximately 12,000 square foot project area is approximately 5,300 feet above mean sea level.

Kirtland AFB's Integrated Natural Resources Management Plan (INRMP) provides interdisciplinary strategic guidance for natural resources management on the installation for a period of 5 years. Implementation of the INRMP ensures that the installation continues to support present and future mission requirements while preserving, improving, and enhancing ecosystem integrity (KAFB 2018a). The 2018 INRMP, which contains the EA for the Prairie Dog Management Program and Burrowing Owl Management Plan, and the Burrowing Owl Monitoring, Management, and Population Status 2020 Annual Report were used as a baseline to develop an understanding of the resources in the project area. Additionally, a biological resource survey was conducted in June 2021.

Vegetation. Four main plant communities occur on Kirtland AFB: grassland (including sagebrush steppe and juniper woodlands), piñon-juniper woodlands, ponderosa pine woodlands, and riparian/wetland/arroyo. As shown in **Figure 3-2** the Proposed Action occurs within the grassland community. This community is found between elevations of 5,200 and 5,700 feet at Kirtland AFB. In the foothills of the Manzanita Mountains, grasslands are found as high as 6,900 feet. Before the land was acquired by the military, the area was rangeland. Since grazing has been eliminated for the past 60 years, much of these grasslands are in good condition. The project area itself consists primarily of disturbed grassland and ruderal vegetation.

Primary grass species include ring muhly (*Muhlenbergia torreyi*), Indian ricegrass (*Achnatherum hymenoides [syn. Oryzopsis hymenoides])*, blue grama (*Bouteloua gracilis)*, black grama (*Bouteloua eriopoda*), six-weeks grama (*Bouteloua barbata*), and spike dropseed (*Sporobolus contractus*). Shrubs commonly found in the grassland community include sand sage brush (*Artemisia filifolia)*, winterfat (*Krascheninnikovia lanata [syn. Eurotia lanata]*), and broom snakeweed (*Gutierrezia sarothrae*). Other species encountered include red three-awn (*Aristida purpurea var. longiseta*), purple three-awn (*Aristida purpurea var. purpurea*), six-weeks three-awn (*Aristida adscensionis*), hairy grama (*Bouteloua hirsute*), mesa dropseed (*Sporobolus flexuosus*),

fourwing saltbush (*Atriplex canescens*), Apache plume (*Fallugia paradoxa*), plains prickly pear (*Opuntia polyacantha*), and great plains yucca (*Yucca glauca*). Transitional shrublands can be found between the grassland and piñon-juniper woodland communities, with many species from both communities inhabiting these areas (KAFB 2018a).

Figure 3-2. Photo of Project Area

Wildlife Species and Habitat. Wildlife communities at Kirtland AFB are typical of those in woodland and grassland habitats in the central New Mexico region. The following provides information on the wildlife found or expected to be found on Kirtland AFB by vegetation community. Species may be transient and travel or inhabit several communities or exist in transitional areas between vegetation communities.

Common birds associated with the grasslands at Kirtland AFB include the horned lark (*Eremophila alpestris)*, scaled quail (*Callipepla squamata)*, mourning dove (*Zenaida macroura)*, greater roadrunner (*Geococcyx californianus)*, American crow (*Corvus brachyrhynchos)*, northern mockingbird (*Mimus polyglottos)*, Crissal thrasher (*Toxostoma crissale)*, lark sparrow

(*Chonedestes grammacus)*, black-throated sparrow (*Amphispiza bilineata)*, western meadowlark (*Sturnella neglecta)*, brown-headed cowbird (*Molothrus ater)*, and house finch (*Carpodacus mexicanus)*. Raptor species known or expected to be found in the grassland habitat include the northern harrier (*Circus cyaneus)*, redtailed hawk (*Buteo jamaicensis)*, Swainson's Hawk (*Buteo swainsoni)*, Ferruginous Hawk (*Buteo regalis)*, American kestrel (*Falco sparverius)*, Prairie Falcon (*Falco mexicanus)*, Great Horned Owl (*Bubo virginianus)*, and Burrowing Owl (*Athene cunicularia spp. hypugaea*). Additionally, Turkey Vultures (*Cathartes aura)* are common scavengers in this habitat. Raptors use the Kirtland AFB grassland areas for hunting throughout the year, but the lack of nesting sites (e.g., trees and cliffs) in these areas limits the use of this habitat for breeding. However, manmade structures may occasionally be used by some species for nesting (KAFB 2018a).

Rabbits, hares, and rodents dominate the mammal community in the grasslands. These include Desert Cottontail (*Sylvilagus audubonii)*, Black-tailed Jack Rabbit (*Californicus lepus*), Spotted Ground Squirrel (*Citellus spilosoma*), Gunnison's Prairie Dog (*Cynomys gunnisonii*), Silky Pocket Mouse (*Perognathus flavus*), Ord's Kangaroo Rat (*Dipodomys ordii*), Banner-tailed Kangaroo Rat (*Dipodomys spectabilis*), Merriam's Kangaroo Rat (*Dipodomys merriami*), Western Harvest Mouse (*Reithrodontomys megalotis)*, Deer Mouse (*Peromyscus maniculatus)*, White-footed Mouse (*Peromyscus leucopus*), and Northern Grasshopper Mouse (*Onychomys leucogaster*). Mammalian predators in the grassland community include the coyote (*Canis latrans*), kit fox (*Vulpes macrotis)*, badger (*Taxidea taxus)*, striped skunk (*Mephitis*), and bobcat (*Lynx rufus*) (KAFB 2018a).

A variety of reptiles and amphibians are found within Kirtland AFB grasslands. Many of these species have extensive periods of dormancy during dry conditions, and rapid breeding cycles when temporary ponds appear after rains. Reptiles and amphibians found on Kirtland AFB include the Woodhouse's Toad (*Bufo woodhousii)*, Red-spotted Toad (*Bufo punctatus)*, New Mexico Spade Foot Toad (*Spea multiplicate)*, Western Box Turtle (*Terrapene ornate spp. Luteola)*, Little-striped Whiptail Lizard (*Cnemidophorus inornatus)*, Short-horned Lizard (*Phrynosoma douglasii)*, Lesser Earless Lizard (*Holbrookia maculate)*, Bull Snake (*Pituophis melanoleucus)*, Western Rattlesnake (*Crotalus viridis*), and Glossy Snake (*Arizona elegans*) (KAFB 2018a).

Threatened and Endangered Species and State Listed. According to USFWS's Information for Planning and Consultation, it was determined that there are five federally listed threatened or endangered species with the potential to occur within the project area (USFWS 2021). The federally listed species that could occur on the installation, the New Mexico meadow jumping mouse (*Zapus hudsonius luteus)*, yellow-billed cuckoo (*Coccyzus americanus occidentalis*), Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*)**,** and Rio Grande silvery minnow (*Hybognathus amarus*)**,** do not have suitable habitat and have not been identified on the installation. However, to ensure no impact, an updated species list from USFWS is required to be obtained within 90 days of starting construction activities. More information about these species can be found in **Appendix C**.

Based on the data provided in the Biota Information System of New Mexico (BISON-M), there are 14 species listed by NMDGF as threatened or endangered are known to occur in Bernalillo County (BISON-M 2021). These species are listed in **Appendix C**. Of these species, two state threatened birds have the potential to occur on Kirtland AFB—the Gray Vireo (*Vireo vicinior*) and Peregrine Falcon (*Falco peregrinus*)**.** Biological surveys are conducted annually in order to monitor federal-listed, state-listed, and other special status species presence on Kirtland AFB (KAFB 2018a).

Table 3-5 lists species that are known to occur on the installation and have the potential to occur within the project area. The table and following text are excerpted from the 2018 INRMP, unless otherwise noted.

Table 3-5. Special Status Species with Potential to Occur at Kirtland AFB

Species	Federal Status	State Status
Gray Vireo	-	Threatened
Peregrine Falcon	Species of Concern	Threatened
Loggerhead Shrike (*Lanius ludovicianus*)	-	New Mexico Species of Greatest Conservation Need
Mountain Plover (*Charadrius montanus)*	-	Sensitive taxa
Western Burrowing Owl (*Athene cunnicularia*)	Species of Concern	-
Long-legged Myotis (*Myotis volans*)	-	Sensitive taxa
Western Small-footed Myotis (*Myotis ciliolabrum*)	-	Sensitive taxa
Gunnison's Prairie Dog	-	Sensitive taxa
Golden Eagle (*Aquila chyrsaetos)*	Bald/Golden Eagle Protection Act	-
Slate Millipede[1] (*Comanchelus chihuanus*)	Species of Concern	
Gramma Grass Cactus[1] (*Sclerocactus papyracanthus*)	Species of Concern	

Notes: myotis = bat; dash denotes category does not apply
Source: KAFB 2018a
[1]Species was described as occurring on Kirtland AFB in the 2018 INRMP, but no further information was provided.

Gray vireo. The gray vireo, a state-threatened species, is a small migratory songbird that occurs They occur in colonies in several locations on Kirtland AFB, primarily throughout the juniper woodland community in an elevational belt of 5,850 to 6,600 feet. Gray vireo populations have increased on Kirtland AFB because of fire suppression activities and the subsequent increase of piñon-juniper stands. Given the lack of suitable habitat, this species is unlikely to occur in the project area.

Peregrine falcon. The peregrine falcon, a state threatened species and federal species of concern, is a medium to large raptor. It is known to occur or potentially breed on Kirtland AFB. Peregrine Falcons utilize every habitat found on the installation and can also be found in urban environments. They require tall cliffs for nesting and hunting, although they have been known to breed in hangars near the airport. They also require ledges, potholes, or small caves which are inaccessible to mammalian predators for successful nesting. Given the lack of suitable habitat, this species is highly unlikely to nest, forage, or use the project area in any way.

Loggerhead shrike. The loggerhead shrike, a state species of greatest conservation need, is a small migratory songbird that occupies the grasslands and shrublands on the east end of the installation, and juniper savannah in the southwest region of the installation that approaches piñon-juniper canyons and foothills. Most of the nests on Kirtland AFB are found in four-wing saltbush. Other common vegetation communities where nesting has been observed include one-seeded juniper and Siberian elm stands. Shrike nest success is highly variable but is low overall and does not occur as frequently in extensive grassland areas with few shrubs, making it unlikely to occur in the project area.

***Mountain plover*.** The mountain plover, a federal species of concern and state sensitive taxa, is a small migratory songbird. Appropriate nesting habitat for this species is limited on the installation; therefore, it is unlikely that the Mountain Plover uses Kirtland AFB during the nesting season.

Western Burrowing Owl. The western burrowing owl, a USFWS Bird of Conservation Concern, is a small ground owl. It is very closely associated with the prairie dog colonies on the installation, as they use abandoned prairie dog burrows for nesting. The owls generally occur on Kirtland AFB between March and October before migrating south, although a few birds may remain on the installation during mild winters. Burrowing owl inventories and monitoring of the population have been conducted every year since 1994; since the species uses prairie dog burrows for nesting, a Prairie Dog Management Plan was developed for the installation, which takes into account burrowing owl habitat requirements. Burrowing owls are found within developed areas where grasses are less dense and are known to occur close to but not within the project area (as shown in **Figure 3-3**). The population of burrowing owls on Kirtland AFB has experienced a sharp decline in size and reproduction, and much of the recent nest failure has been attributed to predation.

Long-legged myotis and western small-footed myotis. Two bat species have been identified on Kirtland AFB, the long-legged myotis and western small-footed myotis, are state sensitive taxa. Habitat on the installation suitable for these species includes cliffs and abandoned mines throughout the withdrawn area. The species are nocturnal and feed on insects near water or rocky cliffs. Threats to the two species include white-nose syndrome, loss of habitat, and disturbance to roost sites. Given the lack of suitable habitat, these species are unlikely to occur in the project area.

Gunnison's prairie dog. The Gunnison's prairie dog, a state sensitive taxa, is a rodent within the squirrel family that occurs in colonies or towns. They occur primarily within grasslands in the northern half of Kirtland AFB and in the cantonment area, but not in the project area. Threats to the population include periodic plague epidemics and loss of habitat. Since burrowing owls use their burrows for nesting, a Prairie Dog Management Plan was developed for the installation. Because burrowing owls on Kirtland AFB almost exclusively use Gunnison's prairie dog burrows for nesting, maintaining a stable population of prairie dogs is critical. This includes limiting the removal of prairie dogs from colonies on the installation whenever possible (Lundblad et al. n.d.).

Golden eagle. The golden eagle is a raptor, federally protected under the Bald and Golden Eagle Protection Act, which occurs on Kirtland AFB. Because of the size of the golden eagle, they are ranked at the top of the food chain as apex predators of avian species. Golden eagles are best suited to hunting in open and semi-open areas and nest in cliffs both seasonally and year-round. Native vegetation seems to be attractive to them and they tend to avoid developed areas of any type from urban to agricultural as well as heavily forested regions. Golden eagles have been observed during avian surveys conducted on the installation and nests have been identified on cliffs in the eastern portion of the installation.

Critical Habitat. Critical habitats are those areas of land, air, or water that are essential for maintaining or restoring threatened or endangered plant or animal populations. Neither the NMDGF nor USFWS has designated or identified any critical habitat on Kirtland AFB or in the project area. 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 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 (KAFB 2018a).

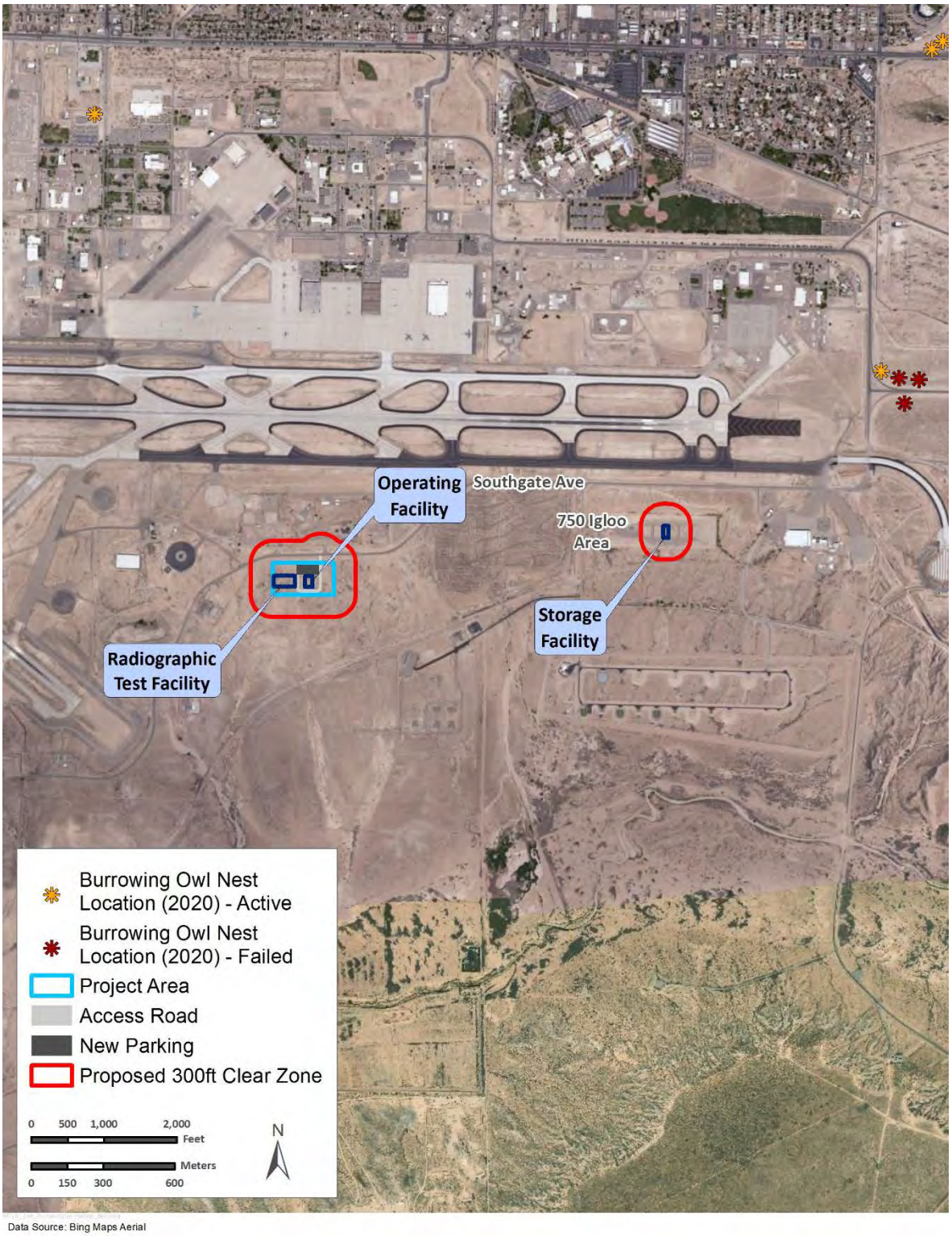

Figure 3-3. Burrowing Owl Habitat Near the Project Area

3.6.2 Environmental Consequences

3.6.2.1 *Proposed Action*

Vegetation. The Proposed Action would result in short-term, negligible to minor, adverse impacts on grassland vegetation. Direct effects on vegetation from removal and crushing and indirect effects from soil compaction and the potential for establishment of invasive species would occur. However, long-term, negligible, beneficial impacts would result from revegetation or landscaping of disturbed sites with native species supporting the native plant community on the installation.

Crushing and soil compaction would occur when vehicles and equipment access, park, and maneuver around the project areas during construction and renovation. These impacts would also occur during construction of the associated access road and parking lot and installation of utility lines and communications infrastructure. Additionally, ground disturbance and transport of construction equipment could increase the potential for the establishment of invasive plant species. Adverse impacts on vegetation would be minimized with the use of appropriate BMPs, such as cleaning construction equipment prior to entering the project area. In accordance with EO 13112, *Invasive Species*, active measures would be implemented to help prevent and control dissemination of invasive plant species during ground-disturbing activities. Revegetation of disturbed sites with native vegetation would further reduce the establishment of invasive species.

***Wildlife Species and Habitat*.** The Proposed Action would result in intermittent, short-term, minor, adverse impacts on wildlife species and habitat. Renovations to the existing storage facility (Igloo 753) and installation of utility lines and communications infrastructure would result in temporary, minor degradation of wildlife habitat, while construction of the new facilities, road, and parking lot would result in permanent, minor degradation of habitat. Adherence to BMPs would minimize unnecessary disturbances to habitat. If vegetation establishment occurs, the project would require a SWPPP and reseeding would be conducted.

Temporary displacement of mobile wildlife from noise, lighting, and other disturbances would occur from construction activities. High-impact maintenance and repair activities that require heavy equipment could cause more-mobile mammals, reptiles, and birds, including breeding migratory birds, to temporarily relocate to nearby similar habitat. This disturbance is expected to be minor and it is assumed that displaced wildlife would return soon after activities conclude. However, in order to avoid nest abandonment and other adverse impacts, surveys would be conducted prior to the start of construction activities. These impacts would be short-term and BMPs would be implemented to minimize adverse impacts.

Individuals of smaller, less-mobile species could be inadvertently killed or injured during ground-disturbing activities or transportation of equipment and personnel. Burrowing animals, such as burrowing owls, rodents, and reptiles, could be impacted. However, vehicles associated with maintenance and repair activities are used primarily on the established roads, which limits the potential for impacts on burrowing species.

Threatened and Endangered and State Listed Species. Although there is no evidence of western burrowing owls in the project area, there is the potential for the Proposed Action to result in short-term, minor, adverse impacts to this federal species of concern. As noted above, ground-disturbing activities could indirectly impact the owls and their habitats, and construction would result in both temporary and permanent, minor degradation of habitat. To help mitigate these impacts, Kirtland AFB has developed a burrowing owl management plan with BMPs, including maintaining a 50-meter buffer around occupied burrows, conducting surveys prior to any construction, having a monitor onsite during construction to observe the owls' response to

construction and ensure their safety, and adding traffic signage for speeding (Cruz-McDonnell and Cruz-Carretero 2007). Owls should be relocated only as a last report and is the responsibility of the USDA Animal and Plant Health Inspection Service. Surveys take place every year and have occurred throughout 2021; no documented observations of burrowing owl or prairie dog colonies have extended into the project area. However, to ensure no impact, an updated species list from USFWS is required to be obtained within 90 days of starting any construction activities (Chaon et al. 2020, USFWS 2021).

Kirtland AFB has previously attempted to move burrowing owls to artificial burrows, particularly along the west side of Manzano Base. The artificial burrows have not been successful in other areas of the installation thus far; however, at this time it is not expected to have to relocate any burrowing owls to conduct the project.

There is also potential for the Proposed Action to result in short-term, negligible to minor, adverse impacts on other migratory birds, including gray vireo, loggerhead shrike, and peregrine falcon. However, while habitat in the project area is suitable for these species, it is not exclusive, meaning other habitat could be easily found on Kirtland AFB. As with the burrowing owl, to ensure no impact, an updated species list from USFWS is required to be obtained within 90 days of starting any construction activities (Chaon et al. 2020, USFWS 2021).

During surveys which took place in June 2021, no burrowing owls or threatened and endangered species were observed. No impacts to threatened and/or endangered species would be expected as a result of the proposed action.

3.6.2.2 *Aggregate Impacts*

Construction and maintenance activities under the Proposed Action as well as present and reasonably foreseeable future projects on the installation and within the city of Albuquerque would result in impacts on vegetation crushing and soil compaction during ground-disturbing activities, which could result in establishment of invasive species. Adverse impacts on vegetation would be minimized through the use of appropriate BMPs, such as cleaning construction equipment prior to entering the project area and measures would be implemented to help prevent and control dissemination of invasive plant species during ground-disturbing activities. Revegetation of disturbed sites with native vegetation would further reduce the establishment of invasive species.

Project activities that require heavy equipment could cause mobile mammals, reptiles, and birds, including breeding migratory birds, to temporarily relocate to nearby similar habitat. This disturbance is expected to be minor, and it is assumed that displaced wildlife would return to areas that had not been improved soon after activities conclude or else would move to adjacent areas of similar habitat. Adverse impacts on wildlife would be minimized through the use of appropriate BMPs, such as conducting surveys prior to any construction activities taking place and scheduling project activities to occur outside of the nesting season of 1 March to 30 September in order to reduce impacts on migratory birds. Although growth and development can be expected to continue outside of Kirtland AFB and within the surrounding natural areas, significant adverse impacts on these resources would not be expected. Therefore, the Proposed Action would not result in a significant cumulative impact on biological resources.

3.6.2.3 *Unavoidable Adverse Impacts*

The Proposed Action would result in a negligible loss of vegetation and wildlife habitat. Because the project area consists primarily of previously disturbed ground with minimal vegetation, the loss

would be negligible and not considered significant; therefore, a less than significant impact to the irretrievable loss of vegetation and wildlife habitat is expected.

3.6.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the REVIL facilities would not occur and conditions would remain the same as described in **Section 3.6.1**. Therefore, no impacts on biological resources would occur.

3.7 CULTURAL RESOURCES

The term 'cultural resource' refers to any prehistoric or historic resource, such as settlement sites, historic archaeological sites, or other evidence of our cultural heritage. The term “historic property” refers specifically to a cultural resource that has been determined to be eligible for inclusion in the National Register of Historic Places (NRHP). Under Section 106 of the NHPA, 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).

3.7.1 Affected Environment

Kirtland AFB has conducted an installation-wide survey of archaeological and cultural resources. A total of 740 archaeological sites were recorded within the boundaries of the installation, and 251 have been determined to be eligible for the NRHP. These sites contain artifacts such as pottery, ground stone, stone tools, and historic artifacts. In addition to artifacts many of the archaeological sites on Kirtland AFB contain features which include hearths, prehistoric structures, storage pits, historic structures, mines, weapons testing structures, and military training structures. In addition to archaeological sites, a total of 2,189 facilities have been evaluated for NRHP eligibility, and 271 were found to be eligible (KAFB 2018b).

Kirtland AFB’s ICRMP addresses cultural resources on the installation. The ICRMP provides guidelines and standard operating procedures to non-technical managers and planners in order to comply with the installation’s legal responsibilities for the preservation of significant archaeological and historic resources (KAFB 2018b).

The APE for the Proposed Action has been defined as the two non-contiguous components of the project area: (1) the site of the proposed Operating and Radiographic Test facilities, which would be adjacent to each other, and (2) Igloo 753, an existing munitions storage igloo in the 750 area that would be renovated. The APE also includes 300-foot clear areas around each of the two components of the project area.

Archaeological and Traditional Cultural Properties. A search of the New Mexico Cultural Resources Information System (NMCRIS) online database and geospatial dataset, maintained by the Archaeological Records Management Section, shows the boundaries of three archaeological surveys that overlap the APE (see **Table 3-6**). No previously recorded archaeological sites or historic properties are within the APE (NMCRIS 2021).

Traditional cultural properties and sacred sites are a special class of cultural resources that require specialized expertise in their identification and assessment. Thirty-four federally recognized tribes—both in- and out-of-state—have been identified as having an interest in protecting cultural resources located on the installation. At present, there are no known Native American burial grounds or sacred areas located within or adjacent to the project area (KAFB 2018b).

Table 3-6. Cultural Resources Surveys Completed within the APE

NMCRIS Report No.	Activity Type	Performing Organization	Total Area Surveyed	Activity End Date
147358	Archaeological Survey/Inventory	SWCA Environmental Consultants	989.5 acres	4 February 2021
125941	Archaeological Survey/Inventory	HDR, Inc.	5,000 acres	30 May 2013
72870	Archaeological Survey/Inventory	AMEC Earth and Environmental, Inc.	16,090 acres	27 March 2001

Architectural Properties. The Proposed Action would include interior renovations to an existing munitions storage facility (Igloo 753), which is within the 750 Igloo Area. In 2006, the Advisory Council on Historic Preservation (ACHP) issued the *Program Comment for World War II and Cold War Era (1939 – 1974) Ammunition Storage Facilities*. By following the Program Comment, DOD meets their responsibilities for compliance under Section 106 for a range of management actions on World War II and Cold War Era ammunition storage facilities that may be eligible for listing in the NRHP, including renovation (ACHP 2006). Real property records identify Igloo 753 has a year-built date of 1960 (Category/ISR Code 422253); therefore, the facility meets the requirements of the Program Comment and Section 106 compliance requirements have been completed.

3.7.2 Environmental Consequences

3.7.2.1 *Proposed Action*

The Proposed Action would result in no impacts on known cultural resources. If previously unidentified archaeological deposits are encountered during ground disturbance associated with construction, the procedures outlined in Section 7.2 of the Kirtland AFB ICRMP would be followed (KAFB 2018b).

3.7.2.2 *Aggregate Impacts*

The Proposed Action would result in no impacts on known cultural resources. Aggregate or cumulative impacts such as increased traffic on roads leading to the new facilities would not impact cultural resources in the APE. Only direct impacts from construction activities have the potential to affect cultural resources in the APE.

3.7.2.3 *Unavoidable Impacts*

There are no known cultural resources within the APE to impact unavoidably. If previously unidentified archaeological deposits are encountered during construction, the procedures outlined in Section 7.2 of the Kirtland AFB ICRMP would be followed (KAFB 2018b).

3.7.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the REVIL facilities would not occur, and the existing conditions discussed in **Section 3.7.1** would remain unchanged. No construction activities would occur in the APE; therefore, no impacts on cultural resources would occur.

3.8 INFRASTRUCTURE

3.8.1 Affected Environment

Transportation. Numerous modes of transportation are available at Kirtland AFB, including air, mass transit, and federal and state highway access. The Sunport, located along the western boundary of the installation, provides commercial and public aviation and military support, particularly for the USAF and Air Force Reserve units. The Albuquerque Transit Department, ABQ RIDE, provides and operates public bus services throughout the city. Several bus routes regularly service Kirtland AFB (ABQ RIDE 2018). There are currently seven gated entrances from the city of Albuquerque to Kirtland AFB including a Contractor's Gate used for truck inspections. Additionally, there are approximately 430 miles of paved roads and 230 miles of unpaved roads on Kirtland AFB.

Utility Systems

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. Overhead electrical lines are present along the northern boundary of the proposed Operating and Radiographic Test facilities (KAFB 2016).

Natural Gas and Propane. Natural gas is supplied by Symmetry Energy Solutions, LLC 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. 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. Natural gas nodes are present at the northern boundary of the proposed Operating and Radiographic Test facilities and a natural gas line running north/south is approximately 0.1 mile east (KAFB 2016).

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. No liquid fuels infrastructure is located within or immediately adjacent to the project area (KAFB 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 (KAFB 2016). There are also approximately 50 miles of non-potable water pipeline serving the Tijeras Golf Course and providing water for fire protection. In 2020, Kirtland AFB pumped a total of 789 million gallons (2,421 acre-feet) of water from these wells. The installation also purchased 83,500 gallons of water from the Albuquerque-Bernalillo County Water Utility Authority (ABCWUA) during the 2020 reporting period (KAFB 2021). Water valves and distribution lines are present along the northern boundary of the proposed Operating and Radiographic Test facilities (KAFB 2016).

Sanitary Sewer/Wastewater System. Approximately 491,000 linear feet of sanitary system mains transports wastewater to the ABCWUA treatment facility. The permissible discharge rate for Kirtland AFB is fixed at 70,805,000 gallons per month. The installation discharges an average of approximately 1.4 mgd, or approximately 42 million gallons per month. 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. Wastewater valves and a sanitary sewer line are present along the norther boundary of the proposed Operating and Radiographic Test facilities (KAFB 2016).

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. Communications lines are present along the northern boundary of the proposed Operating and Radiographic Test facilities (KAFB 2016).

Solid Waste Management. 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. As of 31 December 2020, the remaining capacity of this landfill was 2.08 million cubic yards. In 2019 and 2020, an average of 133,740 tons of construction and demolition waste per year was deposited in this landfill (Wheelock 2021).

3.8.2 Environmental Consequences

3.8.2.1 *Proposed Action*

Transportation. The Proposed Action would result in short- and long-term impacts on the transportation system. Demolition, construction, and maintenance activities associated with the Proposed Action are expected to result in intermittent, short-term, negligible to minor, adverse impacts on area roadways because of a temporary increase in the number of construction-related vehicles accessing the installation. However, early coordination with Kirtland AFB organizations would ensure necessary safety precautions are taken and would allow ample advance notice to affected commuters and personnel. Additionally, construction-related traffic would be timed and not occur during peak travel period. Typical construction-related traffic would include delivery trucks, haul trucks, and passenger vehicles. Long-term impacts on transportation would include increased traffic within the project area, including commuters and personnel, delivery vehicles (potentially including semi-tractor trailer traffic), and maintenance vehicles. These impacts are anticipated to be negligible.

Utility Systems

The Proposed Action is not anticipated to result in any changes to the installation's liquid fuel system, and equipment and construction vehicles would not utilize the installation's fuel supply. Therefore, the liquid fuel system will not be discussed further.

Electrical Systems. The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on the installation's electrical system. The Proposed Action would require installation of new electrical lines to connect the newly constructed buildings to the electrical grid. Interruptions to the electrical system may occur during connection of the newly constructed facilities to the installation's electrical distribution system. Since electrical lines run adjacent to the project area, the anticipated impact from the installation of these new lines is expected to be negligible. Additionally, because Kirtland AFB purchases power from Western Area Power Administration, the net change to the global electrical power grid is expected to be minor.

Natural Gas and Propane. The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on the installation's natural gas and propane system. Existing natural

gas lines adjacent to the project area would be used to connect the newly constructed buildings to the installation's natural gas distribution system. The net change in total natural gas consumption due to the new facilities is expected to be minor. Interruptions to the natural gas system may occur during connection of the newly constructed facilities to the installation's natural gas distribution system.

Water Supply System. The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on the installation's water supply system. Existing water supply lines adjacent to the project area would be accessed to provide water to the facility. The additional water supply lines to the REVIL would not add significant infrastructure to the installation's system. Interruptions to the water supply system may occur during connection of the newly constructed facilities to the installation's water distribution system.

Water used during operation of the REVIL would result in long-term, negligible to minor, adverse impacts on the installation's water supply. Operation of the REVIL facilities would result in a slight increase in water usage on the installation. As discussed in **Section 3.8.2**, Kirtland AFB is allowed to divert up to 6,000 acre-feet (2 billion gallons) of water per year and in 2020 pumped only 2,421 acre-feet (789 million gallons) of water, which is less than half of what is permitted. Therefore, sufficient water resources would be available on the installation to accommodate the slight increase in newly constructed facilities without exceeding current capacity.

Stormwater Handling. The Proposed Action would result in short- and long-term, minor, adverse impacts on stormwater handling at Kirtland AFB. Construction activities would potentially result in adverse impacts on stormwater handling by disruption of natural drainage patterns, contamination of stormwater discharge, and heavy sediment loading. Implementation of strategies described in **Section 3.5.2.1** would reduce these impacts, and the Proposed Action would not be expected to result in significant impacts on the stormwater handling system.

The increase in impervious surfaces as a result of the Proposed Action would result in long-term, minor, adverse impacts on stormwater handling. These potential impacts could include increased erosion and sedimentation and changes in downstream direction and volume of stormwater, which could affect the topography and soil resources. Implementation of techniques described in **Section 3.5.2.1** would reduce these impacts, and the Proposed Action would not be expected to result in significant impact on the stormwater handling system.

Sanitary Sewer/Wastewater System. The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on the sanitary sewer and wastewater system. The Proposed Action would require the integration of sanitary sewer and wastewater systems with the utilities adjacent to the project area. This would slightly increase the sanitary sewer and wastewater system infrastructure at Kirtland AFB. Wastewater from the newly constructed facilities would increase the total sanitary sewer and wastewater generated by the installation. However, current sanitary sewer and wastewater discharge from Kirtland AFB is significantly below the monthly permissible discharge rate. The increase in wastewater generated from operation of the REVIL facilities would not increase the sanitary sewer and wastewater generation to the maximum allowable limit for the installation. Therefore, the total impact to the sanitary sewer and wastewater system would be negligible.

Communications System. The Proposed Action would result in short- and long-term, negligible, adverse impacts on the installation's communications system. New communications lines would need to be installed from the existing communications lines along the northern boundary of the project area to the newly constructed facility. Interruptions to the communications system may occur during connection of the newly constructed facilities to the installation's communications

system. The Proposed Action would potentially need to address both physical (e.g., storage capacity) and logistical (e.g., below or above-ground connections) considerations to ensure security and capacity of the communications system is adequate. Although new communications lines would increase the overall communications infrastructure at the installation, the overall impact is expected to be negligible.

Solid Waste Management. The Proposed Action would result in short- and long-term, minor, adverse impacts on solid waste management at Kirtland AFB. Construction and renovation activities would generate minimal amounts of solid waste, primarily including recyclable and reusable building materials (e.g., concrete, metals). Waste disposal would be conducted in accordance with all federal, state, and local laws and regulations. To reduce the amount of waste disposed of at the landfill, materials that could be recycled or reused would be diverted from landfills to the greatest extent possible.

The weights of all materials diverted for recycling or reuse would be reported to the Kirtland AFB Quality Recycling Program to be credited toward the DOD-mandated construction and demolition diversion rate of 60 percent. Nonhazardous construction and demolition waste that is not recyclable or reusable would be transported to the Kirtland AFB construction and demolition waste landfill for disposal.

Solid waste generated during operation of the REVIL facilities would be added to the waste already collected by a contractor and disposed of at the city of Albuquerque's Cerro Colorado Landfill. The facility would participate in the installation's recycling program to reduce the amount of solid waste sent to landfills. The Proposed Action would increase the overall solid waste generated at Kirtland AFB but would not significantly alter the existing waste and recycling streams maintained by the installation.

3.8.2.2 *Aggregate Impacts*

The Proposed Action would capitalize on many infrastructure elements adjacent to the project area. Activities performed at the facilities would slightly increase electricity, natural gas, and water utilization and would slightly increase the waste generated on the installation. Cumulatively, the Proposed Action and subsequent activities would have minor effects on the installation infrastructure.

3.8.2.3 *Unavoidable Adverse Impacts*

Under the Proposed Action no unavoidable adverse impacts are anticipated.

3.8.2.4 *No Action Alternative*

Under the No Action Alternative, construction and operation of the REVIL facilities would not occur and conditions would remain the same as described in **Section 3.8.1**. Therefore, no impacts on the installation's infrastructure would occur.

3.9 HAZARDOUS MATERIALS AND WASTES

3.9.1 Affected Environment

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. All hazardous materials used by USAF and AFRL are authorized under their respective shop code in the Enterprise Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS). The Kirtland AFB Spill Prevention, Control, and Countermeasures (SPCC) Plan provides standard operating procedures to prevent the occurrence of spills, control measures to prevent spills from entering surface waters, and countermeasures to contain and clean up a hazardous materials spill that could impact surface waters (KAFB 2018c).

The project area where construction of the Operating and Radiographic Test facilities is proposed is undisturbed and does not contain any known hazardous materials or petroleum products. The proposed storage facility, Igloo 753, where minor interior renovations would occur, is within the Igloo 750 area where explosives are stored.

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 (KAFB 2018d). The installation's Hazardous Waste Management Plan (HWMP) establishes the procedures to comply with applicable federal, state, and local standards for solid waste and hazardous waste management. Kirtland AFB is a large-quantity generator of hazardous waste (USEPA ID #NM9570024423).

The project area where construction of the Operating and Radiographic Test facilities is proposed is undisturbed and does not contain known hazardous or petroleum wastes. No known hazardous wastes are generated or stored at Igloo 753 (KAFB 2018d).

Toxic Substances. Toxic substances include asbestos-containing materials (ACM), lead-based paint (LBP), and polychlorinated biphenyls (PCBs), all of which are typically found in building and utility infrastructure. The project area where construction of the Operating and Radiographic Test facilities is proposed is undisturbed and does not contain known toxic substances. Igloo 753, which is proposed for minor renovations, was constructed in 1960 and has the potential to contain toxic substances such as ACM, LBP, and PCBs.

Environmental Restoration Program. Kirtland AFB has 58 active ERP sites (also referred to as SWMUs) 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 Military Munitions Response Program (MMRP) sites, comprising 8,429 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 UXO varies by location (KAFB 2016). Additionally, DOE actively manages 11 open Environmental Restoration (ER) sites on Kirtland AFB property consisting of three groundwater areas of concern and eight SWMUs.

There are no active ERP sites within the project area and no active MMRP or DOE ER sites within or adjacent to the project area. There are four active ERP sites within 0.5 mile of the proposed REVIL facilities (LF-001, ST-288, ST-289, and ST-291) and two within 0.5 mile of the proposed renovation to Igloo 753 (ST-105 and ST-299). **Figure 3-4** presents the location of active ERP sites adjacent to the project area. There are no monitoring wells within the project area.

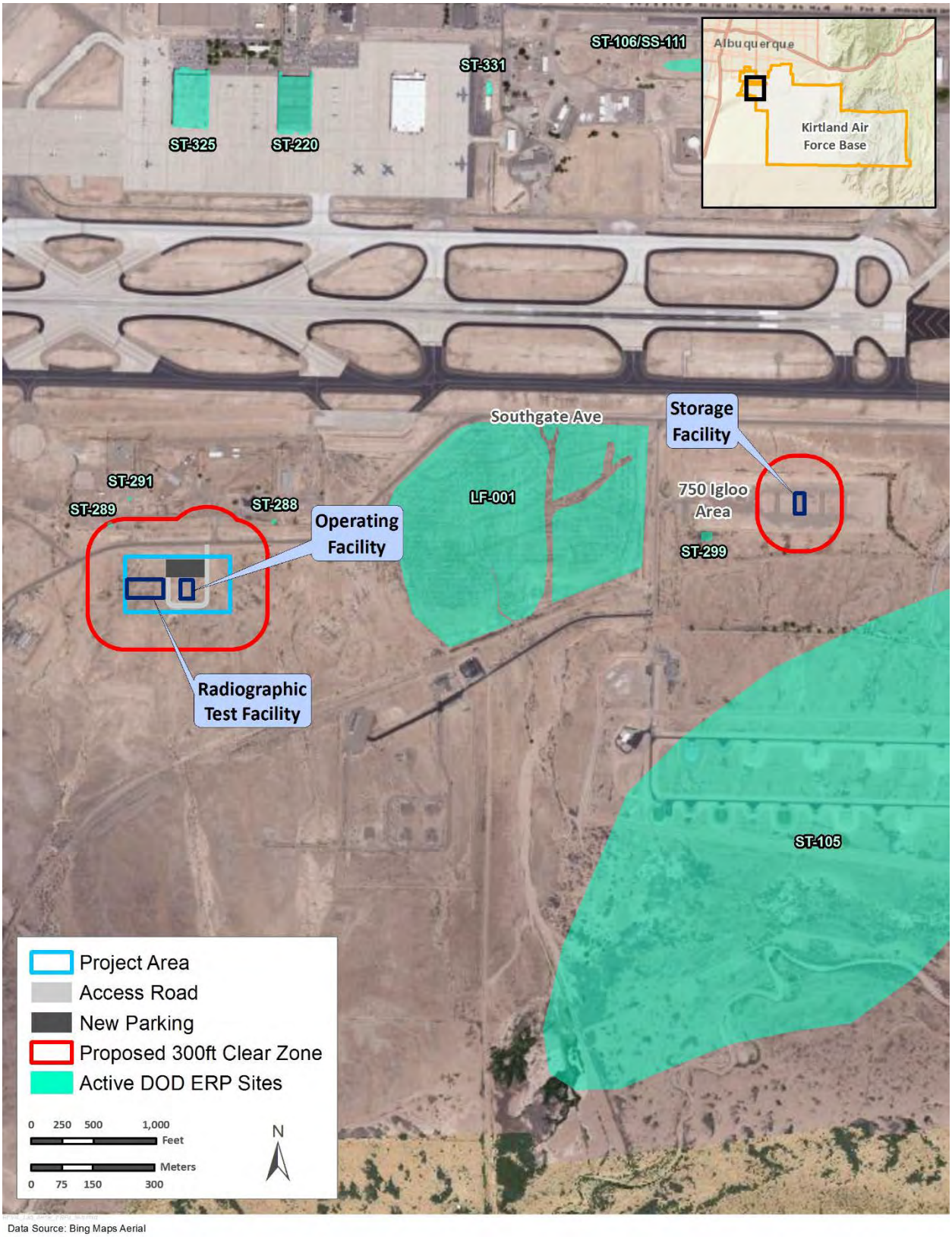

Figure 3-4. ERP Sites Near the Project Area

LF-001, Landfill No. 1, was operated as a trench-and-fill landfill from 1951 to 1975. The landfill contains approximately 425,000 cubic yards of municipal waste and up to 175,000 cubic yards of demolition and construction debris. As part of a Corrective Measures Implementation workplan, a long-term monitoring program was initiated in 1996 and an evapotranspiration cover was completed in June 2006. Groundwater samples are analyzed for inorganics and volatile organic compounds and no concentrations above USEPA maximum contaminant levels have been observed since the landfill was capped (KAFB 2017).

ST-105, Trichloroethylene (TCE) and Nitrate Contaminated Groundwater, is an installation-wide area of contamination to address broad perched and regional groundwater issues across the installation. ST-105 is divided into two components, one related to TCE contamination and the other related to nitrate contamination in groundwater. Suspected sources of the nitrate contamination include the closed sewage lagoons, the golf course main pond, city of Albuquerque sanitary sewer line breaks that occurred in 1994 and 2003, and the Sandia National Laboratories' acid waste outfall line. Both components are currently open with NMED and being monitored for natural attenuation.

ERP Sites ST-288, ST-289, ST-291, and ST-299 are septic systems associated with Buildings 614, 617 and 620, 617, and 751, respectively. The leach fields associated with the septic systems were investigated in 1995. Soil samples were analyzed for volatile organic compounds, semi-volatile organic compounds, total petroleum hydrocarbons, and metals and analytical results were not indicative of a contaminant release. These sites are pending no further action petitions to NMED.

3.9.2 Environmental Consequences

3.9.2.1 *Proposed Action*

The Proposed Action would result in short-term, negligible, adverse and long-term, negligible to minor, adverse and beneficial impacts on hazardous materials and wastes management.

Hazardous Materials and Petroleum Products. Construction of the REVIL and minor interior renovations to Igloo 753 would result in short-term, negligible, adverse impacts. Construction contractors would ensure the handling and storage of any hazardous materials and petroleum products is carried out in compliance with applicable laws and regulations. Additionally, in accordance with the Kirtland AFB HWMP, these requirements would be written into construction contracts. Construction equipment would use small quantities of hazardous materials and petroleum products such as solvents, hydraulic fluid, oil, antifreeze, and other hazardous materials. Hazardous materials could be used for minor equipment servicing and repair activities. Should any hazardous materials or petroleum products be released into the environment, adherence to applicable management plans such as the installation's SPCC Plan would occur. The severity of a potential impact from an accidental release would vary based on the extent of a release and the substances involved. No hazardous materials or petroleum products are stored within the project area. Construction activities may require the temporary use of aboveground storage tanks onsite for power generation or equipment refueling, and their use and maintenance would comply with applicable federal, state, and local laws and regulations to include secondary containment. Aboveground storage tanks would be used temporarily and removed from the project area upon project completion.

Operation of the REVIL would result in long-term, negligible to minor, adverse impacts. Laboratory activities would use hazardous materials, including solvents (e.g., acetone, isopropyl alcohol, etc.) for cleaning components, and equipment and potential hazardous materials associated with 3-D

printers (Montaño 2021). Specific operations would be evaluated and anticipated hazardous materials to be used would be determined by the AFRL Space Vehicles Directorate (RV) Unit Environmental Coordinator (UEC) prior to the start-up of the REVIL facilities. All hazardous materials and petroleum products would be authorized and obtained under the appropriate shop code in EESOH-MIS. Additionally, components and subsystems received at the REVIL would not contain fissile materials but would contain LSA accountable materials.

Hazardous and Petroleum Wastes. Hazardous and petroleum wastes are expected to be generated during construction. Construction would involve the use of hazardous materials and petroleum products, which would result in the generation of hazardous wastes and used petroleum products. 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. Additionally, all hazardous and petroleum wastes generated would be handled and disposed of in accordance with the installation's HWMP and federal, state, and local regulations.

Should unknown, potentially hazardous wastes be discovered or unearthed during construction activities, construction contractors would immediately cease work, contact appropriate installation personnel, and await sampling and analysis results before taking any further action. Any unknown wastes determined to be hazardous would be managed or disposed of in accordance with applicable laws and regulations.

New activities on the installation may introduce or alter a waste stream or require relocation or establishment of an Initial Accumulation Point (IAP) for hazardous and mixed wastes. Specific operations would be evaluated, and hazardous and mixed wastes anticipated to be generated as well as the potential need for the establishment of an IAP would be determined by the AFRL/RV UEC and coordinated with the 377 MSG/CEIEC Hazardous Waste Program prior to the start-up of the REVIL facilities. Hazardous and mixed wastes generated from activities at the REVIL facilities would be managed in accordance with the Kirtland AFB HWMP.

Toxic Substances. Because of its age, Igloo 753 is assumed to contain toxic substances such as ACM, LBP, and PCBs. Prior to renovation, surveys for these substances would be completed, as necessary, by a certified contractor. Appropriate measures would be taken to reduce the potential exposure to, and release of, toxic substances during surveys and any required substance removal activities. Contractors would wear appropriate personal protective equipment (PPE) and adhere to all federal, state, and local regulations as well as the installation's management plans for toxic substances. All ACM-, LBP-, and PCB-contaminated debris would be disposed of at a USEPA-approved landfill. New construction is not likely to include the use of these substances because federal policies and laws limit their use in building construction applications.

Long-term, negligible, beneficial impacts would result from the reduced potential for future human exposure to and reduced amounts of ACMs, LBP, and PCBs to maintain at Kirtland AFB. No short- or long-term, adverse impacts on toxic substances are expected from operation of the REVIL.

Environmental Restoration Program. No short- or long-term impacts on or from ERP sites are expected to result from the Proposed Action. The proposed construction and renovations areas are not within or immediately adjacent to an active ERP, MMRP, or DOE ER site; therefore, the Proposed Action is not expected to result in an impact on or from ERP sites.

3.9.2.2 *Aggregate Impacts*

The Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on hazardous materials and wastes management. The Proposed Action would incorporate appropriate BMPs and environmental protection measures to limit and control hazardous materials and wastes into their design and operations plans. Additional construction activities that coincide with the Proposed Action may contribute to slightly increased levels of hazardous materials used and stored and hazardous wastes generated on the installation; however, all such occurrences would be temporary in nature and cease upon completion of such construction activities. Like all new activities on the installation, specific types of hazardous materials to be used and stored, and hazardous wastes to be generated, as well as the potential need for the establishment of an IAP, would be determined prior to start-up. Therefore, aggregate impacts on hazardous materials and wastes management from the Proposed Action, in conjunction with other actions, would not be significant.

3.9.2.3 *Unavoidable Impacts*

The use and generation of hazardous materials and wastes during construction and operations of the REVIL would be unavoidable; however, the materials and wastes would be handled in accordance with federal, state, and local policies and would not be expected to result in significant impacts.

3.9.2.4 *No Action Alternative*

Under the No Action Alternative, the REVIL would not be constructed, and the existing conditions discussed in **Section 3.10.1** would remain unchanged.

3.10 SAFETY

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 (OSH) agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of 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.

3.10.1 Affected Environment

Contractor Safety. All contractors performing construction and renovation activities are responsible for following federal and state safety regulations and are required to conduct activities in a manner that does not increase risk to workers or the public.

New Mexico is one of several states that administer their own OSH program according to the provision of the federal OSH Act of 1970, which permits a state to administer its own OSH 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. 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.

OSH programs address the health and safety of people at work. OSH 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 or engaged in hazardous waste, asbestos, lead, or other work requiring medical monitoring.

Military Personnel Safety. Each branch of the military has its own policies and regulations that act to protect its workers, despite their work location. AFI 91-202, *The U.S. 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.

Public Safety. 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. The Veterans Affairs Medical Center hospital and the 377th Medical Groups' Outpatient Clinic are the primary military medical facilities at Kirtland AFB. Several other hospitals and clinics, which are devoted to the public, are located off-installation in the city of Albuquerque. These facilities include the Heart Hospital of New Mexico, University of New Mexico Hospital, and Kaseman Presbyterian Hospital.

Albuquerque Fire Rescue (AFR) provides fire suppression, crash response, rescue, emergency medical response, and hazardous substance response to the nearby city of Albuquerque. AFR has 729 full-time, uniformed firefighter/emergency medical technicians, 23 fire engine companies, seven fire ladder companies, five wildland task force stations, two hazardous materials task force stations, and one technical rescue task force station (AFR 2020; City of Albuquerque 2021). The city of Albuquerque also has approximately 525 sworn police officers available to provide law

enforcement services (APD 2019). The Southeast Area Command (Phil Chacon Memorial Substation) borders the northwest corner of Kirtland AFB. A mutual service agreement is in place for fire and emergency services between the city of Albuquerque and Kirtland AFB.

3.10.2 Environmental Consequences

3.10.2.1 *Proposed Action*

Implementation of the Proposed Action would result in short-term and long-term, negligible, adverse impacts. Construction activities associated with the Proposed Action would result in short-term, negligible, adverse impacts on the safety of contractors, military personnel, and the public.

While unlikely, short- and long-term, negligible to moderate, adverse impacts could result from an accident at the Operating Facility in the handling of HEs, radiological material, and beryllium. However, Kirtland AFB has numerous safety protocols in place to prevent and minimize potential impacts.

Contractor Safety. The Proposed Action would result in a short-term, negligible, adverse impact on the health and safety of construction personnel. Construction and renovation activities would slightly increase the health and safety risk to personnel within the project area. The selected construction contractor would be required to develop a comprehensive health and safety plan detailing all potential hazards and site-specific guidance to ensure potential safety risks are minimized. The plan would include, at a minimum, emergency response and evacuation procedures; operating manuals; PPE recommendations; procedures for handling, storing, and disposing of hazardous materials and wastes; information on the effects and symptoms of potential exposures; and guidance with respect to hazard identification. Contractor personnel would be responsible for compliance with applicable federal, state, and local safety regulations and would be educated though daily safety briefings to review upcoming work activities and associated hazards. Only certified contractors would be allowed to perform remediation of toxic substances such as ACM or LBP, would wear appropriate PPE at all times, and be required to adhere to all federal, state, and local regulations during abatement. Therefore, the Proposed Action would not be expected to result in a significant impact on contractor safety.

Military Personnel Safety. The Proposed Action would result in a short-term, negligible, adverse impact on the health and safety of military personnel that work near the construction and renovation areas, and the potential for short-and long-term, negligible to moderate adverse impacts in the event of an accident at the Operating Facility. Construction and renovation activities associated with the Proposed Action would comply with all applicable safety requirements and installation-specific protocols and procedures, including appropriately marking potentially hazardous areas and posting warning signs and barriers to limit access to approved construction and oversight personnel only.

Once the Operating Facility is operational, there is the possibility of an accident occurring during the storage and handling of HEs, radiological material, and beryllium. Kirtland AFB has safety protocols in place based on the *DoD Ammunition and Explosives Safety Standards: General Explosives Safety Information and Requirements* manual, which include a required 300-foot clear zone around the facility to protect military personnel working outside the facility. For those operating inside the facility, AFI 91-202 describes hazard reporting and abatement, proper hazardous waste storage, safety training for relevant personnel, and proper use of protective clothing and equipment. Therefore, the Proposed Action is not expected to result in a significant impact on the safety of military personnel.

Public Safety. The Proposed Action would not result in either short- or long-term impacts on the health and safety of the public. Because the proposed construction and renovation would occur within the boundaries of Kirtland AFB, an active military installation that is not open to the public, the Proposed Action would not pose a safety risk to the public or off-installation areas. Further, the construction areas would be appropriately delineated and posted with access limited to construction and site personnel. Additionally, construction and renovation would comply with all applicable safety requirements and installation-specific protocols and procedures, including appropriately marking potentially hazardous areas and posting warning signs and barriers to limit access to approved construction and oversight personnel only. Upon completion of construction and renovation activities, the REVIL facilities would be secure and include security measures to prevent the public from entering. Therefore, the Proposed Action is not expected to result in a significant impact on public safety.

3.10.2.2 *Aggregate Impacts*

No adverse cumulative impacts on health and safety would be expected from the Proposed Action and present and reasonably foreseeable future projects on the installation and within the city of Albuquerque. Adherence to established procedures, including the use of PPE, fencing project areas and posting signs, and compliance with OSH, DOD, and OSHA standards would reduce or eliminate health and safety impacts on contractors, military personnel, and the general public. These procedures are typical for construction projects on the installation and within the city of Albuquerque. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on health and safety.

3.10.2.3 *Unavoidable Adverse Impacts*

Unavoidable adverse impacts would result from implementation of the Proposed Action; however, none of these impacts would be considered significant. Storage and handling of HEs, radiological material, and beryllium would occur in the Operating Facility, but a 300-foot clear zone would minimize adverse impacts beyond the facility itself in the event of an accident.

3.10.2.4 *No Action Alternative*

Under the No Action Alternative, the REVIL would not be constructed at the proposed site, and USAF would not achieve USAF weapon systems integrator capability. No buildings or other facilities would be constructed on the proposed site. No new safety concerns would occur as a result of the No Action Alternative.

3.11 SOCIOECONOMICS

3.11.1 Affected Environment

Kirtland AFB is located within the Albuquerque Metropolitan Statistical Area (MSA), which is serving as the region of influence for socioeconomic effects of the Proposed Action. Because the 2020 census data have not yet been released, 2019 American Community Survey estimated numbers for population and demographics were used for this analysis. In 2019, the population of the Albuquerque MSA, which is comprised of Bernalillo, Sandoval, Torrance, and Valencia counties, was 912,108 people and the state of New Mexico's population totaled 2,092,454 (USCB 2015-2019a).

The population of Bernalillo County was 677,858 in 2019, representing 32 percent of the total population for the state of New Mexico. From 2010 to 2019, the population of Bernalillo County

increased by approximately 2.3 percent, Sandoval County increased by approximately 8.5 percent, Torrance County decreased by approximately 5.3 percent, and Valencia County decreased by approximately 0.7 percent. The growth rate in the Albuquerque MSA from 2010 to 2019 (2.8 percent) was greater than the growth rate of the state of New Mexico (1.6 percent), but less than the growth rate of the United States (5.2 percent) over the same time period. **Table 3-7** presents the 2010 and 2019 population data (USCB 2010, USCB 2015–2019a).

Table 3-7. Population in the Region of Influence as Compared to New Mexico and the United States (2010 and 2019)

Location	2010	2019	Percent Change
United States	308,745,538	324,697,795	5.2%
New Mexico	2,059,179	2,092,454	1.6%
Albuquerque MSA	887,077	912,108	2.8%
Bernalillo County	662,564	677,858	2.3%
Sandoval County	131,561	142,704	8.5%
Torrance County	16,383	15,519	-5.3%
Valencia County	76,569	76,027	-0.7%

Source: USCB 2010, USCB 2015–2019a

Employment Characteristics. The three largest industries in the Albuquerque MSA in terms of percentage of the workforce employed within the industry are: the educational services, and health care and social assistance industry (26 percent); the professional, scientific, and management, and administrative and waste management services industry (13 percent); and the retail trade industry (11 percent). The construction industry represents 7 percent of the workforce (USCB 2015–2019b). In January 2021, the Bureau of Labor Statistics reported an 8.6 percent unemployment rate in the Albuquerque MSA, while the United States had a lower unemployment rate of 6.8 percent (BLS 2021).

Kirtland AFB. During fiscal year 2018, 22,943 individuals were employed by Kirtland AFB, of which 3,336 were active-duty personnel. Direct payroll expenditures from the installation totaled over $2.2 billion. When non-payroll expenditures associated with Kirtland AFB are included, total expenditures exceeded $7.4 billion, with DOD expenditures representing approximately $4.5 billion of that total (KAFB 2019).

3.11.2 Environmental Consequences

3.11.2.1 *Proposed Action*

Construction of the REVIL would result in a short-term, negligible, beneficial impact on socioeconomics. Direct and indirect, beneficial impacts would result from increased payroll tax revenue and the purchase of construction materials and goods in the area resulting in a beneficial impact on the local economy of the Albuquerque MSA. The proposed construction activities would only require a small number of construction workers over the anticipated 2-year construction period. Based on 2019 employment data, the construction workforce in the Albuquerque MSA would be sufficient to support construction activities associated with the Proposed Action. The temporary increase in construction workers at Kirtland AFB would represent a small increase in the total number of persons working on the installation, but no additional facilities (e.g., housing, schools) would be necessary to accommodate the workforce.

Operation of the REVIL would not result in changes in employment and would be confined to the installation. Therefore, operation would not be likely to generate additional local or regional spending and no long-term impacts on socioeconomics are anticipated.

3.11.2.2 *Aggregate Impacts*

The Proposed Action would result in short-term, negligible, beneficial impact on socioeconomics. Direct and indirect, beneficial impacts would result from increased payroll tax revenue and the purchase of construction materials and goods in the area resulting in a beneficial impact on the local economy of the Albuquerque MSA. Additional construction activities that coincide with the Proposed Action may contribute to a slight increase in the region's economy through the purchase of construction materials and providing employment for construction personnel. Therefore, aggregate impacts on socioeconomics from the Proposed Action, in conjunction with other actions, would not be significant.

3.11.2.3 *Unavoidable Impacts*

No unavoidable adverse impacts on socioeconomics would result from the Proposed Action.

3.11.2.4 *No Action Alternative*

Under the No Action Alternative, the REVIL would not be constructed, and the existing conditions discussed in **Section 3.12.1** would remain unchanged. The No Action Alternative would maintain the current outdated state of AFRL's weapon system design and development capabilities. AFRL would be unable to meet increasing demands for research, development, test, and evaluation investments.

3.12 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The relationship between short-term uses and enhancement of long-term productivity from implementation of the Proposed Action is evaluated from the standpoint of short-term effects and long-term effects. Short-term effects would be those associated with construction of the REVIL facilities. The long-term enhancement of productivity would be those effects associated with operation and maintenance of the facilities after implementation of the Proposed Action.

The Proposed Action represents an enhancement of long-term productivity and enhanced capability for weapon system research and development at Kirtland AFB. The negative effects of short-term impacts from construction activities would be minor compared to the long-term positive impacts of a USAF weapon system research program.

3.13 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the impacts that the use of these resources would have on future generations. Irreversible impacts primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, biological resources, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources used for the Proposed Action would potentially include building materials, concrete and asphalt, and various construction materials and supplies.

Materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources, including petroleum-based products (e.g., gasoline and diesel), used for the Proposed Action would be irretrievably lost. During construction and maintenance activities, gasoline and diesel would be used for the operation of vehicles and construction equipment. However, consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, less than significant impacts would be expected.

Human Resources. The use of human resources for construction and maintenance activities is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

Biological Resources. The Proposed Action would result in a negligible loss of vegetation and wildlife habitat. Because the project area consists primarily of ground with minimal vegetation, the loss would be negligible and not considered significant; therefore, a less than significant impact on the irretrievable loss of vegetation and wildlife habitat is expected.

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APPENDIX A
INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING AND PUBLIC INVOLVEMENT MATERIALS

Federal, State, and Local Agencies – Scoping Letters

The Honorable Martin Heinrich
US Senate
303 Hart Senate Office Building
Washington DC 20510

The Honorable Ben Ray Luján
US Senate
Dirksen Senate Building, Suite B40C
Washington DC 20510

The Honorable Yvette Herrell
US House of Representatives
1305 Longworth House Office Building
Washington DC 20515

The Honorable Deb Haaland
US House of Representatives
1421 Longworth House Office Building
Washington DC 20515

The Honorable Teresa Leger Fernandez
US House of Representatives
1432 Longworth House Office Building
Washington DC 20515

Ms. Stephanie Garcia Richard
Commissioner of Public Lands
New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe NM 87501

Ms. Sarah Cottrell Propst
Cabinet Secretary-Designate
New Mexico Energy, Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe NM 87505

Commissioners
Bernalillo County Board of Commissioners
One Civic Plaza NW 10th Floor
Albuquerque NM 87102

Councilmember
Albuquerque City Councilmembers
PO Box 1293
Albuquerque NM 87103

Mr. Matt Wunder, Chief
New Mexico Department of Game and Fish
Conservation Services
PO Box 25112
Santa Fe NM 87504

Mr. Rob Lowe, Regional Administrator
Federal Aviation Administration, Southwest Region
10101 Hillwood Parkway
Fort Worth TX 76177-1524

Mr. Martin Meairs, District Conservationist
Natural Resources Conservation Service
Los Lunas Service Center
2600 Palmilla Road
Los Lunas NM 87031

Board of Directors
Mid-Region Council of Governments
809 Copper Avenue NW
Albuquerque NM 87102

Mr. Jeff M. Witte, Director/Secretary
New Mexico Department of Agriculture
MSC 3189 Box 30005
Las Cruces NM 88003

Mr. James C. Kenney, Cabinet Secretary
New Mexico Environment Department
Office of General Counsel & Environmental Policy
PO Box 5469
Santa Fe NM 87502-5469

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Bernalillo County Manager
Bernalillo County Manager's Office
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Director of Communications
City of Albuquerque Office of the Mayor
PO Box 1293
Albuquerque NM 87103

Ms. Patricia Mattingly
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Bureau of Indian Affairs, Southwest Regional Office
1001 Indian School Road NW
Albuquerque NM 87104

Mr. Mark Matthews
Acting District Manager
Bureau of Land Management, Albuquerque District Office
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Pan American Building, Suite 330
Albuquerque NM 87109

Ms. Susan King
Regional Environmental Officer
US Department of Interior, Office of Environmental Policy and Compliance, Albuquerque Region
1001 Indian School Road NW, Suite 348
Albuquerque NM 87104

Mr. George MacDonell
Chief of Environmental Resources Section
USACE Albuquerque District
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Albuquerque NM 87109

Mr. David Gray
Acting Regional Administrator
US Environmental Protection Agency, Region 6
1201 Elm Street, Suite 500
Dallas TX 75270

Ms. Cheryl Prewitt
Regional Environmental Coordinator
US Forest Service, Southwest Region
333 Broadway Boulevard SE
Albuquerque NM 87102

Ms. Jessica Small
DOE/NNSA Sandia Field Office
PO Box 5400
Albuquerque NM 87187

Mr. John Weckerle
DOE/NNSA Office of General Counsel
PO Box 5400
Albuquerque NM 87187

Agency Responses to Scoping Letters

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
Southwest Regional Office
1001 Indian School Road NW
Albuquerque, New Mexico 87104

In Reply Refer To:
620-Division of Environmental, Safety, and Cultural Resources Management

May 19, 2021

National Environmental Policy Act (NEPA) Program Manager
377 MSG/CEIEC
2050 Wyoming Boulevard SE, Suite 116
Kirtland Air Force Base, NM 87117

Dear NEPA Program Manager:

Our office has received your request for comments on the United States Air Force (USAF) Environmental Assessment for the construction and operation of Re-entry Vehicle Integration Laboratory facilities for the Air Force Research Laboratory at Kirtland Air Force Base, New Mexico. The proposed action does not impact trust resources under the jurisdiction of the Bureau of Indian Affairs; therefore, we do not have any comments. We do request that USAF consult with any local Pueblo or Tribe regarding Section 106 consultation of the National Historic Preservation Act.

Thank you for the opportunity to participate and comment on the proposed action. If you have any questions or concerns, please contact Ms. Michelle Dela Cruz, Acting Regional Environmental Protection Specialist at (505) 563-3406.

Sincerely,

Patricia L. Mattingly

Patricia L. Mattingly
Regional Director

MICHELLE LUJAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

Certified Mail - Return Receipt Requested

July 23, 2021

Colonel David S. Miller
Base Commander
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB, NM 87117

Lt. Colonel Wayne J. Acosta
Civil Engineer Office
377 Civil Engineering Division
2050 Wyoming Blvd SE, Suite 116
Kirtland AFB, NM 87117

RE: STATUS UPDATE – INVESTIGATION WORK PLAN AND INVESTIGATION REPORTS FOR MULTIPLE SWMUS
KIRTLAND AIR FORCE BASE, NEW MEXICO
EPA ID # NM9570024423
HWB-KAFB-21-MISC

Dear Colonel Miller and Colonel Acosta:

The New Mexico Environment Department (NMED) received the U.S. Air Force (Permittee) Kirtland Air Force Base (Facility) Environmental Assessment (EA) of Re-entry Vehicle Integration Laboratory (REVIL) Facilities for AFLR (EA), on May 6, 2021. During the review for the EA, several SWMUs were found to be located near the proposed new facilities. These include SWMU 10-21-B, ST-291, Septic System Bldg. 617, SWMU 10-21-B, ST-289, Septic System Bldg. 617 & 620, SWMU 10-21-B, ST-288, Septic System Bldg. 614, and SWMU 10-21-D ST-299, Septic System Bldg. 751. These nearby SWMUs, as well as numerous other SWMUs, were listed in Table I-3, Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Corrective Action in the Facility Operating Permit as requiring an Investigation Report.

NMED does not have a record of receiving either an Investigation Work Plan (WP) or an Investigation Report in its Administrative Record for the following SWMUs listed in the table below.

SWMU	IRP Site	Site Name	Requirement	Due Date
6-4	LF-008	LF-008 Selenium in GW	Investigation WP	3/31/2011
10-21-B	ST-288	Septic System Bldg 614	Investigation Report	12/31/2012
10-21-B	ST-289	Septic System Bldg 617 & 620	Investigation Report	12/31/2012
10-21-B	ST-291	Septic System Bldg 617	Investigation Report	12/31/2012
10-21-C	ST-294	Septic System Bldg 633	Investigation Report	12/31/2012
10-21-C	ST-298	Septic System Bldg 730 & 734	Investigation Report	12/31/2012
10-21-C	ST-299	Septic System Bldg 751	Investigation Report	12/31/2012
10-21-P	ST-312	Septic System Plant 2 & Bldg 37503	Investigation Report	12/31/2012
10-21-S	ST-314	Septic System Bldgs 48056 & 48059	Investigation Report	12/31/2012
10-21-T	ST-316	Septic System CERF Bldgs 57001 & 57002	Investigation Report	12/31/2012
10-21-AA	ST-333	Septic System SOR Bldg 66001	Investigation Report	6/30/2013
10-21-AA	ST-343	Septic System SOR Bldg 66000 & 66008	Investigation Report	6/30/2013
10-21-AA	ST-344	Septic System SOR Bldg 66042	Investigation Report	6/30/2013

NMED requests the Permittee identify when the documents were submitted, submit the relevant Work Plans or Investigation Reports by **September 30, 2021**, or explain why they have not yet been submitted. Note that any extension requests for these documents must be accompanied by a justification for the extension(s) and a request for a Class 1 Permit Modification.

If you have any questions regarding this letter, please contact Naomi Davidson at (505) 690-7567.

Sincerely,

Ricardo Maestas Digitally signed by Ricardo Maestas
Date: 2021.07.22 11:56:54 -06'00'

Ricardo Maestas
Acting Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
N. Davidson, NMED HWB
B. Wear, NMED HWB
L. King, EPA Region 6 (6LCRRC)
S. Clark, KAFB

File: KAFB 2021 and Reading

Joint Land Use Study Memorandum of Understanding – Scoping Letters

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Assistant Commissioner for Commercial Resources
New Mexico State Land Office
PO Box 1148
Santa Fe NM 87504

Development Manager/Department Director
Bernalillo County Planning Section
111 Union Square SE, Suite 100
Albuquerque NM 87102

Mr. Brennon Williams
Director
City of Albuquerque Planning Department
PO Box 1293
Albuquerque NM 87103

US Fish and Wildlife Service – Scoping Letter

Ms. Amy Leuders, Regional Director
US Fish & Wildlife Service
Southwest Regional Office
PO Box 1306
Albuquerque NM 87103-1306

U.S. Fish and Wildlife Service Information for Planning and Consultation Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
Phone: (505) 346-2525 Fax: (505) 346-2542
http://www.fws.gov/southwest/es/NewMexico/
http://www.fws.gov/southwest/es/ES_Lists_Main2.html

In Reply Refer To:
Consultation Code: 02ENNM00-2021-SLI-1550
Event Code: 02ENNM00-2021-E-03706
Project Name: Kirtland REVIL EA

August 23, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your recent request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of New Mexico wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

If you determine that your proposed action may affect federally-listed species, consultation with the Service will be necessary. Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with

Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take "after-the-fact." For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

The scope of federally listed species compliance not only includes direct effects, but also any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects that may occur in the action area. The action area includes all areas to be affected, not merely the immediate area involved in the action. Large projects may have effects outside the immediate area to species not listed here that should be addressed. If your action area has suitable habitat for any of the attached species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts.

Candidate Species and Other Sensitive Species

A list of candidate and other sensitive species in your area is also attached. Candidate species and other sensitive species are species that have no legal protection under the ESA, although we recommend that candidate and other sensitive species be included in your surveys and considered for planning purposes. The Service monitors the status of these species. If significant declines occur, these species could potentially be listed. Therefore, actions that may contribute to their decline should be avoided.

Lists of sensitive species including State-listed endangered and threatened species are compiled by New Mexico state agencies. These lists, along with species information, can be found at the following websites:

Biota Information System of New Mexico (BISON-M): www.bison-m.org

New Mexico State Forestry. The New Mexico Endangered Plant Program: www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html

New Mexico Rare Plant Technical Council, New Mexico Rare Plants: nmrareplants.unm.edu

Natural Heritage New Mexico, online species database: nhnm.unm.edu

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value.

We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website, www.fws.gov/wetlands/Data/Mapper.html integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's Migratory Bird Office. To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern at website www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction.

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to "disturb" eagles. Under the BGEPA, the Service may issue limited permits to incidentally "take" eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at www.fws.gov/midwest/eagle/guidelines/bgepa.html.

On our web site www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm, we have included conservation measures that can minimize impacts to federally listed and other sensitive species. These include measures for communication towers, power line safety for raptors, road and highway improvements, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

We also suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding State fish, wildlife, and plants.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please call 505-346-2525 or email nmesfo@fws.gov and reference your Service Consultation Tracking Number.

Attachment(s):

- Official Species List
- Migratory Birds

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
(505) 346-2525

Project Summary

Consultation Code: 02ENNM00-2021-SLI-1550
Event Code: 02ENNM00-2021-E-03706
Project Name: Kirtland REVIL EA
Project Type: MILITARY OPERATIONS / MANEUVERS
Project Description: This project supports a proposal by the Air Force Research Laboratory (AFRL) of the Air Force Materiel Command (AFMC), a tenant unit at Kirtland AFB, to construct and operate Re-entry Vehicle Integration Laboratory (REVIL) facilities at Kirtland AFB (the Proposed Action). This would be accomplished through the construction of two new facilities and the renovation of one storage facility totaling up to 12,000 square feet. The REVIL would consist of an Operating Facility, Radiographic Testing Facility, and Storage Facility. The Storage Facility would be located within the 750 Igloo Area, which is an existing munitions storage area northeast of the proposed Operating and Radiographic Testing facilities. In addition, because of potential hazards, a 300-foot clear zone would be required around the facility. This 300-foot clear zone is for the storage of explosives only as no fissile materials would be handled. The REVIL would provide nuclear research, development, test, evaluation, and system integration; capabilities for new USAF nuclear programs; and leverage existing cross directorate AFRL and Department of Energy (DOE) facilities. Construction of the REVIL is planned for fiscal years (FYs) 2022 through 2024.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.0375161,-106.59036537015082,14z

Counties: Bernalillo County, New Mexico

me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
New Mexico Meadow Jumping Mouse *Zapus hudsonius luteus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7965	Endangered

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Rio Grande Silvery Minnow *Hybognathus amarus*	Endangered

Population: Wherever found, except where listed as an experimental population
There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/1391

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay *Gymnorhinus cyanocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15

NAME	BREEDING SEASON
Virginia's Warbler *Vermivora virginiae* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

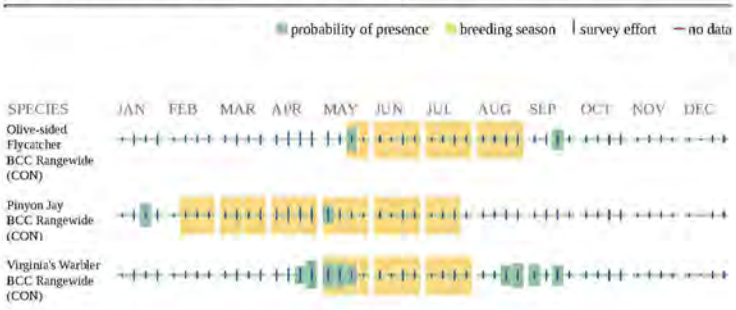
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell

State Historic Preservation Office – Scoping Letter

Jeff Pappas, PhD
State Historic Preservation Officer and Director
New Mexico Historic Preservation Division
Department of Cultural Affairs
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe NM 87501

State Historic Preservation Office Response to Scoping Letter

Michelle Lujan
Grisham
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

May 14, 2021

Colonel David S. Miller, USAF
Commander
3 77th Air Base Wing
2000 Wyoming Boulevard SE
Kirtland Air Force Base NM 87117

Re: HPD Log # 115103, Environmental Assessment to address the potential environmental impacts associated with the construction and operation of Re-entry Vehicle Integration Laboratory facilities for the Air Force Research Laboratory at Kirtland Air Force Base.

Dear Colonel Miller:

Thank you for consulting the State Historic Preservation Officer (SHPO). I am writing in response to your letter in which you requested the initiation of government-to-government consultation regarding the National Environment Policy Act (NEPA) compliance for the aforementioned project. The SHPO will initiate consultation for this project when a formal Section 106 consultation letter from Kirtland Air Force Base is received by our office.

We can be reached at (505) 827-6320, or, if you have any concerns or questions, please contact me by phone at (505)-452-6115 or e-mail me at richard.reycraft@state.nm.us.

Sincerely,
Richard Reycraft
Richard Reycraft
Archaeological Review, New Mexico SHPO

State Historic Preservation Office Response to Section 106 Consultation Letter

Michelle Lujan Grisham
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

June 10, 2021

David H. Reynolds
377 MSG/CEIEC
2050 Wyoming Blvd. SE
Kirtland AFB NM 87117

Dear Mr. Reynolds:

The New Mexico State Historic Preservation Office has completed its review of the REVIL project on the property of Kirtland Air Force Base. We concur with the finding in the Kirtland cultural resources survey that neither historic properties (buildings or structures) nor archeological resources are present in the area of potential effects, and we, therefore, conclude that this proposed project will have no adverse effect.

If you have any questions, please contact me at steven.moffson@state.nm.us.

Best regards,

Steven Moffson
State and National Register Coordinator

HPD Log 114224

Native American Tribes – Scoping Letters

Governor Brian D. Vallo
Pueblo of Acoma
PO Box 309
Acoma NM 87034

Governor Joseph L. Herrera
Pueblo of Cochiti
PO Box 70
Cochiti Pueblo NM 87072

Chairman Timothy L. Nuvangyaoma
Hopi Tribal Council
PO Box 123
Kykotsmovi AZ 86039

Governor Vernon B. Abeita
Pueblo of Isleta
PO Box 1270
Isleta NM 87022

Governor Michael Toledo, Jr.
Pueblo of Jemez
PO Box 100
Jemez Pueblo NM 87024

President Edward Velarde
Jicarilla Apache Nation
PO Box 507
Dulce NM 87528

Governor John E. Antonio
Pueblo of Laguna
PO Box 194
Laguna Pueblo NM 87026

President Gabe Aguilar
Mescalero Apache Tribe of the Mescalero Apache Reservation
PO Box 227
Mescalero NM 88340

Governor Phillip A. Perez
Pueblo of Nambe
15A NP 102 West
Santa Fe NM 87506

President Jonathan Nez
Navajo Nation
PO Box 7440
Window Rock AZ 86515

Governor Patrick Aguino
Ohkay Owingeh Pueblo
PO Box 1099
San Juan Pueblo NM 87566

Governor Craig Quanchello
Pueblo of Picuris
PO Box 127
Peñasco NM 87553

Governor Joseph M. Talachy
Pueblo of Pojoaque
78 Cities of Gold Road
Santa Fe NM 87506

Governor Stuart Paisano
Pueblo of Sandia
481 Sandia Loop
Bernalillo NM 87004

Governor Anthony Ortiz
Pueblo of San Felipe
PO Box 4339
San Felipe Pueblo NM 87001

Governor Christopher Moquino
Pueblo of San Ildefonso
02 Tunyo Po
Santa Fe NM 87506

Governor Ulysses Leon
Pueblo of Santa Ana
2 Dove Road
Santa Ana Pueblo NM 87004

Governor J. Michael Chavarria
Pueblo of Santa Clara
PO Box 580
Española NM 87532

Governor Sidelio Tenorio
Pueblo of Santo Domingo
PO Box 99
Santo Domingo Pueblo NM 87052

Governor Clyde M. Romero, Sr.
Pueblo of Taos
PO Box 1846
Taos NM 87571

Governor Mark Mitchell
Pueblo of Tesuque
02 TP828
Santa Fe NM 87506

Tribal Chairwoman Gwendena Lee-Gatewood
White Mountain Apache Tribe
PO Box 700
Whiteriver AZ 85941

Governor E. Michael Silvas
Ysleta del Sur Pueblo
117 Old Pueblo Road, PO Box 17579
El Paso TX 79907

Governor Jerome Lucero
Pueblo of Zia
135 Capitol Square Drive
Zia Pueblo, NM 87053-6013

Governor Val R. Panteah, Sr.
Pueblo of Zuni
PO Box 339
Zuni NM 87327

Chairwoman Lori Gooday-Ware
Fort Sill Apache Tribe of Oklahoma
43187 US Highway 281
Apache OK 73006
Chairman Manuel Heart
Ute Mountain Ute Tribe
124 Mike Wash Road
Towaoc CO 81334

Chairman Bobby Komardley
Apache Tribe of Oklahoma
PO Box 1330
Anadarko OK 73005

Chairman Matthew Komalty
Kiowa Tribe of Oklahoma
PO Box 369
Carnegie OK 73015

Chairman William Nelson, Sr.
Comanche Nation of Oklahoma
PO Box 908
Lawton OK 73502

President Jimmy Whiteshirt
Pawnee Nation of Oklahoma
PO Box 470
Pawnee OK 74058

Chairman Terry Rambler
San Carlos Apache Tribe
PO Box 0
San Carlos AZ 85550

Chairwoman Christine Sage
Southern Ute Indian Tribe
PO Box 737
Ignacio CO 81137

President Terri Parton
Wichita & Affiliated Tribes
Wichita Executive Committee
PO Box 729
Anadarko OK 73005

Tribal Responses to Scoping Letters

From: Nicolas Frederick
To: Hannah Kopydlowski
Subject: FW: [External] - RE: REVIL FW: ENVIRONMENTAL ASSESSMENT
Date: Tuesday, May 25, 2021 2:08:54 PM

FYI. Needs to go into our PDEA appendix

Nicolas Frederick
Senior Project Manager
DAWSON
Mobile: 919.698.8060

From: Bare, Michelle <Michelle.Bare@hdrinc.com>
Sent: Tuesday, May 25, 2021 2:07 PM
To: CLARK, MELISSA B GS-13 USAF AFGSC 377 MSG/CEIE <melissa.clark.8@us.af.mil>; Nicolas Frederick <nfrederick@dawsonohana.com>
Cc: REYNOLDS, DAVID H GS-12 USAF AFGSC 377 MSG/CEIEC <david.reynolds.37@us.af.mil>
Subject: [External] - RE: REVIL FW: ENVIRONMENTAL ASSESSMENT

Thanks so much!

Michelle

Michelle Bare
M 505.504.0405

hdrinc.com/follow-us

From: CLARK, MELISSA B GS-13 USAF AFGSC 377 MSG/CEIE <melissa.clark.8@us.af.mil>
Sent: Tuesday, May 25, 2021 12:00 PM
To: Bare, Michelle <Michelle.Bare@hdrinc.com>; Nicolas Frederick <nfrederick@dawsonohana.com>
Cc: REYNOLDS, DAVID H GS-12 USAF AFGSC 377 MSG/CEIEC <david.reynolds.37@us.af.mil>
Subject: REVIL FW: ENVIRONMENTAL ASSESSMENT

Just received this response.

From: Timothy Begay <tbegay@navajo-nsn.gov>
Sent: Tuesday, May 25, 2021 11:57 AM
To: CLARK, MELISSA B GS-13 USAF AFGSC 377 MSG/CEIE <melissa.clark.8@us.af.mil>
Subject: [Non-DoD Source] ENVIRONMENTAL ASSESSMENT

Dear Ms. Clark:

The Navajo Nation Heritage and Historic Preservation Department's (NNHHPD) Traditional Culture Program is (TCP) in receipt of your letter regarding the Department of the Air Force 377th Air Base Wing preparing an Environmental Assessment to address potential environmental impacts associated with the construction and operation of Re-entry Vehicle Integration Laboratory facilities at Kirtland Air Force Base, Albuquerque, New Mexico.

After reviewing your letter, NNHHPD has no concerns regarding the construction laboratory facilities and you may proceed without further consultation for this project.

If you have any additional questions, concerns or would like to discuss these issues further, please don't hesitate to contact our office at (928) 871-7198 or (928) 871-7152. Thank you for including the Navajo Nation in the consultation process.

Sincerely,

Timothy C. Begay
Navajo Cultural Specialist
Navajo Nation Heritage and Historic Preservation Department
P.O. Box 4950
Window Rock AZ 86515
Office Phone: (928)871-7152
tbegay@navajo-nsn.gov

From: Nicolas Frederick
To: Hannah Kopydlowski
Subject: FW: [External] - FW: USAF Proposed Preparation of an (EA) to address the potential environmental impacts associated with the construction and operation of (REVIL) facilities at (AFRL) at Kirtland Air Force Base, New Mexico
Date: Tuesday, May 4, 2021 9:57:12 AM

Needs to go in our PDEA appendix for scoping comments. Also needs to be filed in our AR.

Nicolas Frederick
Senior Project Manager
DAWSON
Mobile: 919.698.8060

From: CLARK, MELISSA B GS-13 USAF AFGSC 377 MSG/CEIE <melissa.clark.8@us.af.mil>
Sent: Tuesday, May 4, 2021 9:55 AM
To: REYNOLDS, DAVID H GS-12 USAF AFGSC 377 MSG/CEIEC <david.reynolds.37@us.af.mil>; Bare, Michelle <Michelle.Bare@hdrinc.com>; Nicolas Frederick <nfrederick@dawsonohana.com>
Subject: [External] - FW: USAF Proposed Preparation of an (EA) to address the potential environmental impacts associated with the construction and operation of (REVIL) facilities at (AFRL) at Kirtland Air Force Base, New Mexico

FYI

From: Javier Loera <jloera@ydsp-nsn.gov>
Sent: Friday, April 30, 2021 3:46 PM
To: 377 MSG/CEIE NEPA Environmental <KirtlandNEPA@us.af.mil>
Subject: [Non-DoD Source] USAF Proposed Preparation of an (EA) to address the potential environmental impacts associated with the construction and operation of (REVIL) facilities at (AFRL) at Kirtland Air Force Base, New Mexico

Good afternoon NEPA Program Manager, 377MSG/CEIEC,

This e-mail is in response to the correspondence received in our office in which you provide the Ysleta del Sur Pueblo the opportunity to comment on **USAF Proposed Preparation of an (EA) to address the potential environmental impacts associated with the construction and operation of (AFRL) at Kirtland Air Force Base, New Mexico.**

The Ysleta del Sur Pueblo does not have any comments nor does it request consultation on this **Proposed Action.**

Thank you for allowing us the opportunity to comment on this project.

Sincerely,

Javier Loera
Tribal Council/ Tribal Historic Office
for
Governor E. Michael Silvas
117 S. Old Pueblo Rd.
El Paso, Texas 79907

Federal, State, and Local Agencies – Public Notice Letters

Mr. Matt Wunder, Chief
Ecological & Environmental Planning
New Mexico Department of Game and Fish
PO Box 25112
Santa Fe NM 87504

Ms. Patricia Mattingly, Regional Director
and Regional Environmental Specialist
Bureau of Indian Affairs
Southwest Region Regional Office
1001 Indian School Road NW
Albuquerque NM 87104

Mr. Mark Matthews, Acting District Manager
Bureau of Land Management
Albuquerque District Office
100 Sun Avenue NE, Suite 330
Pan American Building
Albuquerque NM 87109-4676

Ms. Susan King
Regional Environmental Officer
US Department of Interior
Office of Environmental Policy &
Compliance - Albuquerque Region
1001 Indian School Road NW, Suite 348
Albuquerque NM 87104

Mr. Rob Lowe Regional Administrator
Federal Aviation Administration
Southwest Region
10101 Hillwood Parkway
Fort Worth TX 76177-1524

Ms. Roxann Moore, Acting District
Conservationist
Natural Resources Conservation Service
Albuquerque Service Center
100 Sun Avenue NE, Suite 160
Albuquerque NM 87109

Mr. George MacDonnell, Chief of
Environmental Resources Section
USACE Albuquerque District
4101 Jefferson Plaza NE
Albuquerque NM 87109-3435

Mr. David Gray, Acting Regional
Administrator
US Environmental Protection Agency,
Region 6
1201 Elm Street, Suite 500
Dallas TX 75270

Ms. Cheryl Prewitt, Regional Environmental
Coordinator
US Forest Service
Southwestern Region
333 Broadway Boulevard SE
Albuquerque NM 87102-3407

Board of Directors
Mid-Region Council of Governments
809 Copper Avenue NW
Albuquerque NM 87102

Mr. Jeff M. Witte, Director/Secretary
New Mexico Department of Agriculture
MSC 3189 Box 30005
Las Cruces NM 88003-8005

Mr. James C. Kenney, Cabinet Secretary
Office of General Counsel & Environmental
Policy
New Mexico Environment Department
PO Box 5469
Santa Fe NM 87502-5469

Ms. Julie Morgas Baca, Bernalillo County
Manager
Bernalillo County Manager's Office
One Civic Plaza NW 10th Floor
Albuquerque NM 87102

Mr. Matthew Ross
Communications Director
City of Albuquerque Office of the Mayor
PO Box 1293
Albuquerque NM 87103

Ms. Jessica Small
DOE/NNSA Sandia Field Office
PO Box 5400
Albuquerque NM 87187

Mr. John Weckerle
DOE/NNSA Office of General Counsel
PO Box 5400
Albuquerque NM 87187

The Honorable Martin Heinrich
US Senate
303 Hart Senate Office Building
Washington DC 20510

The Honorable Ben R. Luján
US Senate
Dirksen Senate Building, Suite B40C
Washington DC 20510

The Honorable Yvette Herrell
US House of Representatives
1305 Longworth House Office Building
Washington DC 20515

The Honorable Teresa Leger Fernandez
US House of Representatives
1432 Longworth House Office Building
Washington DC 20515

The Honorable Melanie Stansbury
US House of Representatives
1421 Longworth House Office Building
Washington DC 20515-3101

Ms. Stephanie Garcia Richard
Commissioner of Public Lands
New Mexico State Land Office
PO Box 1148
Santa Fe NM 87504

Ms. Sarah Cottrell Propst, Cabinet Secretary
New Mexico Energy, Minerals and Natural Resources Department
Wendell Chino Building
1220 South St. Francis Drive
Santa Fe NM 87505

Bernalillo County Board of Commissioners
One Civic Plaza NW 10th Floor
Albuquerque NM 87102

Albuquerque City Councilmembers
PO Box 1293
Albuquerque NM 87103

Joint Land Use Study Memorandum of Understanding – Public Notice Letters

Mr. Steve Vierck
Assistant Commissioner for Commercial Resources
New Mexico State Land Office
PO Box 1148
Santa Fe NM 87504

Development Manager/Department Director
Bernalillo County Planning Section
111 Union Square SE, Suite 100
Albuquerque NM 87102

Mr. Brennon Williams, Department Director
City of Albuquerque Planning Department
PO Box 1293
Albuquerque NM 87103

US Fish and Wildlife Service – Public Notice Letter

Ms. Amy Leuders, Regional Director
US Fish & Wildlife Service
Southwest Regional Office
PO Box 1306
Albuquerque NM 87103-1306

State Historic Preservation Office – Public Notice Letter

Jeff Pappas, PhD
State Historic Preservation Officer and Director
New Mexico Historic Preservation Division
Department of Cultural Affairs
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe NM 87501

Native American Tribes – Public Notice Letters

Governor Brian Vallo
Pueblo of Acoma
PO Box 309
Acoma Pueblo NM 87034

Governor Joseph L. Herrera
Pueblo of Cochiti
PO Box 70
Cochiti Pueblo NM 87072

Chairman Timothy L. Nuvangyaoma
Hopi Tribal Council
PO Box 123
Kykotsmovi AZ 86039

Governor Vernon B. Abeita
Pueblo of Isleta
PO Box 1270
Isleta NM 87022

Governor Michael Toledo, Jr.
Pueblo of Jemez
PO Box 100
Jemez Pueblo NM 87024

President Edward Velarde
Jicarilla Apache Nation
PO Box 507
Dulce NM 87528

Governor John E. Antonio
Pueblo of Laguna
PO Box 194
Laguna NM 87026

President Gabe Aguilar
Mescalero Apache Tribe
PO Box 227
Mescalero NM 88340

Governor Phillip A. Perez
Pueblo of Nambe
15A Bay Poe
Nambe Pueblo NM 87506

President Johnathan Nez
Navajo Nation
PO Box 7440
Window Rock AZ 86515

Governor Patrick Aguino
Ohkay Owingeh Pueblo
PO Box 1099
San Juan Pueblo NM 87566

Governor Craig Quanchello
Pueblo of Picuris
PO Box 127
Peñasco NM 87553

Governor Jenelle Roybal
Pueblo of Pojoaque
78 Cities of Gold
Santa Fe NM 87506

Governor Stewart Paisano
Pueblo of Sandia
481 Sandia Loop
Bernalillo NM 87004

Governor Anthony Ortiz
Pueblo of San Felipe
PO Box 4339
San Felipe Pueblo NM 87001

Governor Christopher Moquino
Pueblo of San Ildefonso
02 Tunyo Po
Santa Fe NM 87506

Governor Ulysses Leon
Pueblo of Santa Ana
2 Dove Road
Santa Ana Pueblo NM 87004

Governor J. Michael Chavarria
Pueblo of Santa Clara
PO Box 580
Española NM 87532

Governor Sidelio Tenorio
Pueblo of Santo Domingo
PO Box 99
Santo Domingo Pueblo NM 87052

Governor Clyde M. Romero, Sr.
Pueblo of Taos
PO Box 1846
Taos NM 87571

Governor Mark Mitchell
Pueblo of Tesuque
20 TP828
Santa Fe NM 87506

Tribal Chairwoman Gwendena Lee-Gatewood
White Mountain Apache Tribe
PO Box 700
Whiteriver AZ 85941

Governor E. Michael Silvas
Ysleta del Sur Pueblo
119 S Old Pueblo Road
PO Box 17579
El Paso TX 79907

Governor Jerome Lucero
Pueblo of Zia
135 Capitol Square Drive
Zia Pueblo NM 87053-6013

Governor Val R. Panteah, Sr.
Pueblo of Zuni
PO Box 339
Zuni NM 87327

Chairwoman Lori Gooday-Ware
Fort Sill Apache Tribe of Oklahoma
43187 US Highway 281
Apache OK 73006

Chairman Manuel Heart
Ute Mountain Ute Tribe
124 Mike Wash Road
Towaoc CO 81334-0248

Chairman Bobby Komardley
Apache Tribe of Oklahoma
PO Box 1330
Anadarko OK 73005

Chairman Matthew Komalty
Kiowa Tribe of Oklahoma
PO Box 369
Carnegie OK 73015

Chairman William Nelson, Sr.
Comanche Nation of Oklahoma
PO Box 908
Lawton OK 73502

President Jimmy Whiteshirt
Pawnee Nation of Oklahoma
PO Box 470
Pawnee OK 74058

Chairman Terry Rambler
San Carlos Apache Tribe
PO Box 0
San Carlos AZ 85550

Chairwoman Christine Sage
Southern Ute Indian Tribe
PO Box 737
Ignacio CO 81137

President Terri Parton
Wichita & Affiliated Tribes
Wichita Executive Committee
PO Box 729
Anadarko OK 73005

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APPENDIX B
AIR QUALITY SUPPORT DOCUMENTATION

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the Environmental Impact Analysis Process (EIAP) (32 CFR 989); and the General Conformity Rule (GCR) (40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: KIRTLAND AFB
State: New Mexico
County(s): Bernalillo
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Construction and Operation of Re-Entry Vehicle Integration Laboratory Facilities at Kirtland Air Force Base, New Mexico

c. Project Number/s (if applicable):

d. Projected Action Start Date: 10 / 2021

e. Action Description:

See Sections 1.2 and 1.3 of the EA.

f. Point of Contact:

Name: Carolyn Hein
Title: Environmental Scientist
Organization: HDR
Email: carolyn.hein@hdrinc.com
Phone Number: (484) 612-1060

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR *de minimis* values (25 ton/year for lead and 100 ton/year for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see Chapter 4 of the Air Force Air Quality EIAP Guide, Volume II - Advanced Assessments.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

Analysis Summary:

2021

Pollutant	Action Emissions (ton/year)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/year)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.110	100	No
NO_x	0.715	100	No
CO	0.640	250	No
SO_x	0.002	250	No
PM_{10}	4.580	100	No
$PM_{2.5}$	0.030	250	No
Pb	0.000	25	No
NH_3	0.000	250	No
CO_2e	162.4		

2022

Pollutant	Action Emissions (ton/year)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/year)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.358	100	No
NO_x	2.159	100	No
CO	2.288	250	No
SO_x	0.006	250	No
PM_{10}	9.413	100	No
$PM_{2.5}$	0.089	250	No
Pb	0.000	25	No
NH_3	0.001	250	No
CO_2e	568.6		

2023

Pollutant	Action Emissions (ton/year)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/year)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.128	100	No
NO_x	0.676	100	No
CO	1.025	250	No
SO_x	0.002	250	No
PM_{10}	0.024	100	No
$PM_{2.5}$	0.024	250	No
Pb	0.000	25	No
NH_3	0.001	250	No
CO_2e	234.8		

2024

Pollutant	Action Emissions (ton/year)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/year)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.306	100	No
NO_x	0.959	100	No
CO	1.331	250	No
SO_x	0.002	250	No
PM_{10}	0.047	100	No
$PM_{2.5}$	0.047	250	No

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

Pb	0.000	25	No
NH_3	0.001	250	No
CO_2e	248.0		

2025 - (Steady State)

Pollutant	Action Emissions (ton/year)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/year)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.003	100	No
NO_x	0.046	100	No
CO	0.039	250	No
SO_x	0.000	250	No
PM_{10}	0.004	100	No
$PM_{2.5}$	0.004	250	No
Pb	0.000	25	No
NH_3	0.000	250	No
CO_2e	55.5		

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

Carolyn Hein, Environmental Scientist

4/6/2021
DATE

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: KIRTLAND AFB
State: New Mexico
County(s): Bernalillo
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Construction and Operation of Re-Entry Vehicle Integration Laboratory Facilities at Kirtland Air Force Base, New Mexico

- Project Number/s (if applicable):

- Projected Action Start Date: 10 / 2021

- Action Purpose and Need:
See Section 2.0 of the EA.

- Action Description:
See Sections 1.2 and 1.3 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Environmental Scientist
Organization: HDR
Email: carolyn.hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Construct REVIL
3.	Heating	Heat Operating Facility
4.	Heating	Heat Radiographic Test Facility

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Bernalillo
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct REVIL Facilities

- Activity Description:
Construction of the REVIL facilities is planned for fiscal years (FYs) 2022 through 2024. For the purposes of this analysis, it was assumed the construction period for the REVIL facilities would be from October 2021 through September 2024 (36 months).

Site grading:
Grade entire project areas totaling 3.5 acres (152,460 square feet). Site grading will begin in October 2021 and last approximately 9 months.

Trenching:
750 feet of 5-foot wide-wide trenches (3,750 square feet) was conservatively estimated to be required for site utility lines at the Operating Facility and Radiographic Test Facility. Trenching will begin in July 2022 and last approximately 6 months.

Construction:
Approximately 11,112 square feet of new building construction at all project areas. Construction will begin in January 2023 and last approximately 15 months.

Architectural Coatings:
Total - 11,112 square feet
Architectural coatings will begin in in January 2024 and last approximately 3 months.

Paving:
Approximately 2.5 acres (108,900 square feet) of permanent pavement. Paving will begin in April 2024 and last approximately 6 months.

- Activity Start Date
Start Month: 10
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 9
End Month: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.901232
SO_x	0.012352
NO_x	4.496601
CO	5.274477
PM_{10}	14.062966

Pollutant	Total Emissions (TONs)
$PM_{2.5}$	0.188978
Pb	0.000000
NH_3	0.002689
CO_2e	1199.9

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 9
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (square feet): 152,460

Amount of Material to be Hauled On-Site (cubic yards): 0
Amount of Material to be Hauled Off-Site (cubic yards): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust
Average Hauling Truck Capacity (cubic yards): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (pound/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
LDGV	000.309	000.002	000.239	003.421	000.007	000.006		000.023	00318.896
LDGT	000.374	000.003	000.418	004.700	000.009	000.008		000.024	00411.188
HDGV	000.696	000.005	001.076	015.187	000.021	000.019		000.044	00758.535
LDDV	000.115	000.003	000.139	002.492	000.004	000.004		000.008	00309.094
LDDT	000.250	000.004	000.394	004.238	000.007	000.006		000.008	00438.938
HDDV	000.572	000.013	005.669	001.917	000.170	000.156		000.030	01506.304
MC	002.734	000.003	000.845	013.302	000.027	000.023		000.055	00396.858

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 pound / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (pound/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (cubic yards)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (cubic yards)
HC: Average Hauling Truck Capacity (cubic yards)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC cubic yards)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 6
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (square feet): 3,750
Amount of Material to be Hauled On-Site (cubic yards): 0
Amount of Material to be Hauled Off-Site (cubic yards): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (cubic yards): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (pound/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								

	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
LDGV	000.309	000.002	000.239	003.421	000.007	000.006		000.023	00318.896
LDGT	000.374	000.003	000.418	004.700	000.009	000.008		000.024	00411.188
HDGV	000.696	000.005	001.076	015.187	000.021	000.019		000.044	00758.535
LDDV	000.115	000.003	000.139	002.492	000.004	000.004		000.008	00309.094
LDDT	000.250	000.004	000.394	004.238	000.007	000.006		000.008	00438.938
HDDV	000.572	000.013	005.669	001.917	000.170	000.156		000.030	01506.304
MC	002.734	000.003	000.845	013.302	000.027	000.023		000.055	00396.858

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 pound / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (pound/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (cubic yards)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (cubic yards)
HC: Average Hauling Truck Capacity (cubic yards)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC cubic yards)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 15
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (square feet): 11,112
Height of Building (feet): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (pound/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0754	0.0013	0.5027	0.3786	0.0181	0.0181	0.0068	128.79
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0258	0.0006	0.1108	0.2145	0.0034	0.0034	0.0023	54.454
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
LDGV	000.309	000.002	000.239	003.421	000.007	000.006		000.023	00318.896
LDGT	000.374	000.003	000.418	004.700	000.009	000.008		000.024	00411.188
HDGV	000.696	000.005	001.076	015.187	000.021	000.019		000.044	00758.535
LDDV	000.115	000.003	000.139	002.492	000.004	000.004		000.008	00309.094
LDDT	000.250	000.004	000.394	004.238	000.007	000.006		000.008	00438.938
HDDV	000.572	000.013	005.669	001.917	000.170	000.156		000.030	01506.304
MC	002.734	000.003	000.845	013.302	000.027	000.023		000.055	00396.858

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (pound/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (square feet)
BH: Height of Building (feet)
(0.42 / 1000): Conversion Factor cubic feet to trips (0.42 trip / 1,000 cubic feet)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (square feet)
BH: Height of Building (feet)
(0.38 / 1000): Conversion Factor cubic feet to trips (0.38 trip / 1,000 cubic feet)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 3
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Nonresidential
Total Square Footage (square feet): 11,112
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
LDGV	000.309	000.002	000.239	003.421	000.007	000.006		000.023	00318.896
LDGT	000.374	000.003	000.418	004.700	000.009	000.008		000.024	00411.188
HDGV	000.696	000.005	001.076	015.187	000.021	000.019		000.044	00758.535
LDDV	000.115	000.003	000.139	002.492	000.004	000.004		000.008	00309.094
LDDT	000.250	000.004	000.394	004.238	000.007	000.006		000.008	00438.938
HDDV	000.572	000.013	005.669	001.917	000.170	000.156		000.030	01506.304
MC	002.734	000.003	000.845	013.302	000.027	000.023		000.055	00396.858

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (square feet)
800: Conversion Factor square feet to man days (1 square foot / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (square feet)
2.0: Conversion Factor total area to coated area (2.0 square feet coated area / total area)
0.0116: Emission Factor (pound/square feet)
2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 6
Number of Days: 0

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (square feet): 108,900

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (pound/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
LDGV	000.309	000.002	000.239	003.421	000.007	000.006		000.023	00318.896
LDGT	000.374	000.003	000.418	004.700	000.009	000.008		000.024	00411.188
HDGV	000.696	000.005	001.076	015.187	000.021	000.019		000.044	00758.535
LDDV	000.115	000.003	000.139	002.492	000.004	000.004		000.008	00309.094
LDDT	000.250	000.004	000.394	004.238	000.007	000.006		000.008	00438.938
HDDV	000.572	000.013	005.669	001.917	000.170	000.156		000.030	01506.304
MC	002.734	000.003	000.845	013.302	000.027	000.023		000.055	00396.858

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (pound/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (square feet)
0.25: Thickness of Paving Area (feet)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 cubic yard / 27 cubic feet)
HC: Average Hauling Truck Capacity (cubic yards)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC cubic yards)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (pound/acre)
PA: Paving Area (square feet)
43560: Conversion Factor square feet to acre (43,560 square feet / acre)^2 / acre)

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Bernalillo
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Heat Operating Facility

- Activity Description:
Heat Operating Facility (8,000 square feet).

- Activity Start Date
Start Month: 10
Start Year: 2024

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.001902
SO_x	0.000208
NO_x	0.034590
CO	0.029056
PM_{10}	0.002629

Pollutant	Emissions Per Year (TONs)
$PM_{2.5}$	0.002629
Pb	0.000000
NH_3	0.000000
CO_2e	41.6

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (square feet): 8,000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hour)
Heat Value (MMBtu/cubic feet): 0.00105
Energy Intensity (MMBtu/square feet): 0.0908

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (pound/1000000 scf)

VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

3.4 Heating Formula(s)

- Heating Fuel Consumption square feet per Year

FC_{HER}= HA * EI / HV / 1,000,000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (square feet)
EI: Energy Intensity Requirement (MMBtu/square feet)
HV: Heat Value (MMBTU/cubic feet)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

4. Heating

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Bernalillo
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Heat Radiographic Test Facility

- Activity Description:
Heat Radiographic Test Facility (3,000 square feet)

- Activity Start Date
Start Month: 10
Start Year: 2024

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000633
SO_x	0.000069
NO_x	0.011514
CO	0.009672
PM_{10}	0.000875

Pollutant	Emissions Per Year (TONs)
$PM_{2.5}$	0.000875
Pb	0.000000
NH_3	0.000000
CO_2e	13.9

4.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (square feet): 3,000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hour)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0806

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

4.3 Heating Emission Factor(s)

- Heating Emission Factors (pound/1000000 scf)

VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

4.4 Heating Formula(s)

- Heating Fuel Consumption cubic feet per Year

FC_{HER}= HA * EI / HV / 1,000,000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (square feet)
EI: Energy Intensity Requirement (MMBtu/square feet)
HV: Heat Value (MMBTU/cubic feet)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

APPENDIX C
THREATENED AND ENDANGERED SPECIES

Appendix C
Threatened and Endangered Species

Common Name	Scientific Name	USFWS	NMDGF	Critical Habitat	Habitat Type	Known Present at Kirtland AFB	Potential to Occur in Project Area
Spotted Bat	*Euderma maculatum*		T		Prefers arid regions, desert scrub, and open forest in rugged landscapes. They roost on vertical cliffs and in open canyons. Their habitat always seems to be associated with a water source such as a spring, creek, river, or lake.		Low likelihood of occurring at the site
New Mexico Meadow Jumping Mouse	*Zapus hudsonius luteus*	E	E	Y	Prefers low undergrowth consisting of grasses and forbs in open wet meadows and riparian corridors; they also favor lowlands with medium to high moisture over drier uplands and are most common in lush vegetation along watercourses or in herbaceous understories in wooded areas.		Low likelihood of occurring at the site
Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	T			Lives mainly among the canopies of deciduous trees; for example in woodland patches with gaps and clearings. In the West, this species is rare and restricted to the cottonwood-dominated forests that line larger rivers running through arid country.		Low likelihood of occurring at the site
Broad-billed Hummingbird	*Cynanthus latirostris*		T		Live and nest in areas such as canyons, foothills and streambeds. Distribution in any particular area is closely tied to the availability and abundance of appropriate food plants.		Low likelihood of occurring at the site
Least Tern	*Sternula antillarum*		E		Migratory bird species, nesting along freshwater habitats of the Missouri and Mississippi rivers and their major tributaries		Low likelihood of occurring at the site
Neotropical Cormorant	*Phalacrocorax brasilianu*		T		Occupies a variety of fresh, brackish, and saltwater wetlands.		Low likelihood of occurring at the site
Bald Eagle	*Haliaeetus leucocephalus*		T		Prefers lakes and reservoirs with lots of fish and surrounding forests. During their migration, bald eagles are seen near all types of water habitats.		Low likelihood of occurring at the site
Common Black Hawk	*Buteogallus anthracinus*		T		Mainly coastal, resident bird of mangrove swamps, estuaries, and adjacent dry open woodland, though there are inland populations		Low likelihood of occurring at the site

Common Name	Scientific Name	USFWS	NMDGF	Critical Habitat	Habitat Type	Known Present at Kirtland AFB	Potential to Occur in Project Area
Mexican Spotted Owl	*Strix occidentalis lucida*	T		Y	Mixed-conifer and pine-oak forests are commonly used as habitat; can be found in piñon-juniper and ponderosa pine.		Low likelihood of occurring at the site
Aplomado Falcon	*Falco femoralis*		E		Desert and coastal grasslands with scattered yuccas and mesquites.		Low likelihood of occurring at the site
Peregrine Falcon	*Falco peregrinus*		T		Prefer wide-open spaces, and thrive near coasts where shorebirds are common, but they can be found everywhere from tundra to deserts.	Yes	Potential to use or occur at the site.
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	E	Y	Occupies areas with willows or other shrubs near standing or running water. In winter, they use shrubby clearings, pastures, and woodland edges often near water.		Low likelihood of occurring at the site
Bell's Vireo	*Vireo bellii*		T		Shrubby, scrubby habitats such as young forests, stands of dense brush on the prairies, verdant arroyos, and mesquite woods.		Low likelihood of occurring at the site
Gray Vireo	*Vireo vicinior*		T		Breeds almost exclusively in undisturbed mixed grass and tallgrass prairies. While they can sometimes be found in hayfields or pastures with some native grasses, these habitats are inferior to native grasslands. Because of this species' secretive nature away from its breeding grounds, not much is known about the habitat they require the rest of the year.	Yes	Potential to use or occur at the site.
Baird's Sparrow	*Centronyx bairdii*		T		Grassland habitats. Rely on the (now diminishing) tallgrass prairies, mixed grass prairies, and moister fescue prairies of northern United States and southern Canada.		Low likelihood of occurring at the site
Rio Grande Silvery Minnow	*Hybognathus amarus*	E	E	Y	Prefers large streams with slow to moderate current flowing over a mud, gravel substrate, or shifting sand-silt substrate bottom.		None

Notes: E=Endangered; T=Threatened; Y=Yes
Source: BISON-M 2021 and USFWS 2021.