United States Air Force

846th Test Squadron

Holloman Air Force Base

New Mexico

High Speed Test Track Operations

Draft Programmatic Environmental Assessment

November 2021

Acronyms and Abbreviations

AEDC	Arnold Engineering Development Complex
AETC	Air Education and Training Command
AFMAN	Air Force Manual
AFOSH	Air Force Occupational and Environmental Safety, Fire protection, and Health
ARC	Antenna Relay Center
BASH	Bird/Wildlife Aircraft Strike Hazard Management
BSC	Biological Soil Crust
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DDESB	Defense Department Explosive Safety Board
DESR	Defense Explosive Safety Regulation
DLADS	Defense Logistics Agency Disposition Services
DOD	Department of Defense
DODI	Department of Defense Instruction
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
FONSI	Finding of No Significant Impact
GPS	Global Positioning System
HABS/HAER	Historic American Buildings Survey/Historic American Engineering Record
HAFB	Holloman Air Force Base
HHSTT	Holloman High Speed Test Track
HTS	Horizontal Test Stand
HWMP	Hazardous Waste Management Program
IAP	Initial Accumulation Point
IRP	Installation Restoration Program
MAGLEV	Magnetic Levitation
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
NAAQS	National Ambient Air Quality Standards
NATA	National-scale Air Toxics Assessment

NEPA	National Environmental Policy Act
NEW	Net Explosive Weight
NHPA	National Historic Preservation Act
NG	Narrow Gauge
NMDGF	New Mexico Department of Game and Fish
NOA	Notice of Availability
NRCS	Natural Resource Conservation Service
NRHP	National register of Historic Places
OR	Operational Requirements
OSHA	Occupational Safety and Health Act
PEA	Programmatic Environmental Assessment
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
TDC	Track Data Center
TNT	Trinitrotoluene
TS	Test Squadron
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
WSMR	White Sands Missile Range

COVER SHEET

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PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR THE HIGH SPEED TEST TRACK OPERATIONS AT HOLLOMAN AIR FORCE BASE, NEW MEXICO

Responsible Agencies: United States Air Force (USAF) and 846th Test Squadron

Affected Location: Holloman Air Force Base (HAFB), New Mexico

Report Designation: Programmatic Environmental Assessment (PEA)

Abstract: This PEA was developed in compliance with the USAF's Environmental Impact Analysis Process in support of the continued operations, maintenance, and modifications of the High Speed Test Track at Holloman AFB, New Mexico. The Holloman High Speed Test Track (HHSTT), a premiere rocket sled test track, is the longest, most precisely aligned and best instrumented facility of its kind in the world. The HHSTT is available for ground-based test and evaluation activities required by State or Federal agencies, allied foreign nations, educational research organizations and commercial entities. The HHSTT is operated by the 846th Test Squadron (TS) and supports their mission to plan and execute world class rocket sled tests that enable critical weapon system development in support of the warfighter. The HHSTT provides a critical link between laboratory investigations and full-scale flight tests by providing a safe, efficient, and cost-effective ground-test alternative to expensive developmental flight tests. In addition, the HHSTT complex provides ancillary facilities for artificial rain simulation, an ejection test area, captive and free-flight blast test sites, impact test sites, and a decommissioned horizontal rocket test stand. Support facilities include buildings for electronic and photo-optical instrumentation, a telemetry ground station, as well as engineering and shop facilities for design and fabrication of test hardware. The HHSTT also supports the Department of Defense (DOD) Major Range and Test Facility Base which conducts developmental and operation test and evaluation activities in support of DOD Instruction (DODI) 5000.1 and DODI 5000.2 for weapons systems acquisition programs. The PEA evaluates all ground-based test and operational activities conducted at the HHSTT, except for the Magnetic Levitation (MAGLEV) Sled Track Operations, which is covered under another environmental assessment.

This PEA supports a proposal by the United States Air Force, 846th TS to continue operations of the HHSTT including minor modifications within the existing built environment and processes. The facility modifications are limited to extension of the rain field system attached to the Track and modernization of the controls, valves, pumps, and pipes. Operational process modifications are limited to updated best management practices and standard operating procedures that are intended to further avoid adverse impacts on human health and the environment.

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1. Purpose and Need for Action

1.1. INTRODUCTION

Holloman Air Force Base (HAFB), located approximately 15 miles west of Alamogordo, New Mexico (see Figure 1), is home of the 846th Test Squadron (TS), part of the 704th Test Group of the Arnold Engineering Development Complex (AEDC), that operates, maintains, and modifies the Holloman High Speed Test Track (HHSTT). The HHSTT is located at the far northwest edge of HAFB along the eastern edge of the gypsum (white sand) dune fields, totaling 50,971 feet in length. The White Sands Missile Range borders HAFB on the western and northern boundaries providing an uninhabited area of more than 50 miles, with White Sands National Monument to the south and southwest providing additional uninhabited areas. The area beyond the northern end of the HHSTT is an unobstructed, uninhabited, highly instrumented free-flight test range 50 miles long under the jurisdiction of White Sands Missile Range, which is permitted to the HHSTT for test purposes. The three communities to the east of the HHSTT—Alamogordo, La Luz, and Tularosa—are eight or more miles from the Track; the closest large cities, Albuquerque, NM and El Paso, TX, are approximately 180 miles to the north and 95 miles to the southwest, respectively. The remote location of the HHSTT makes it ideally suited for the types of tests conducted at the Track and minimizes safety or health risks caused by rocket exhaust, shock waves, sonic booms and high explosives blast effects.

The HHSTT is the longest, most precisely aligned, and best instrumented facility of its kind in the world. The HHSTT has been continually maintained and upgraded to meet DOD needs for Research Development Test and Evaluation and Operational Test and Evaluation under highly precise and rigorously controlled conditions since 1950. The HHSTT provides a critical link between laboratory investigations and full-scale flight tests by providing a safe, efficient, and cost-effective ground-test alternative to expensive developmental flight tests. In addition, the HHSTT complex provides ancillary facilities for artificial rain simulation, an ejection test area, captive and free-flight blast test sites, impact test sites, and a decommissioned horizontal rocket test stand.

This PEA supports a proposal by the United States Air Force, 846th TS to make minor modifications to the HHSTT while continuing to operate and maintain the facility. The HHSTT is a tenant unit of the 49th Wing, Air Education and Training Command (AETC) at HAFB. The HHSTT is under Air Force Material Command at Wright-Patterson AFB in Ohio, and the Air Force Test Center at Edwards AFB in California, that serves both domestic and international clients. The proposal to continue operations of the HHSTT with modifications would include installation of rainfield infrastructure on the east side of the track to move the rainfield valve sets. The proposed rainfield modifications would expand the rain erosion testing capability. The HHSTT would continue to provide management and operation of track-related DOD developmental and operational test and evaluation activities in support of DOD Directive 5000.01 for weapons systems acquisition programs. A separate proposal for reconstruction, modernization or complete replacement of the HHSTT is planned to begin in 2023 and will be addressed in a separate environmental analysis specific to that action.

1.2. BACKGROUND

Tests are conducted on a year-round basis with the frequency dependent on complexity of tests and client needs. The frequency of tests can vary from one to seventeen tests per day, one to three times per week. The tests range from simple to complex and large in scale requiring substantial preparation. In track testing, payloads are moved rapidly along a straight-line path by means of rocket-powered sleds operating on a set of heavy-duty crane rail tracks. The sleds are propelled by multi-stage solid fuel rocket motors, with sleds capable of reaching speeds of over 9,400 feet/second (this speed was reached in 2003 during a land-speed record-setting test). Gas or diesel vehicles are used to tow sleds from either end of the launch point and may also be employed to tow a test article at low speeds. Additionally, a multipurpose rail-

mounted utility cart using a diesel engine is used for maintenance and deploying braking or helium tunnel materials. The following types of test capabilities provided by the HHSTT fill the gap in the spectrum of aerospace ground testing by providing the missing link between laboratory-type investigations and full-scale flight test:

- Full-scale testing of dynamic events which do not lend themselves to simulation by other ground test approaches, such as dynamic evaluation and qualification of aircraft crew escape (ejection) systems, full-scale impact tests, ejection and release testing of weapons systems, and simulation of missile launch trajectories.
- Performance regimes for which other ground test techniques cannot fulfill the essential flight conditions and environmental constraints, such as extended supersonic or hypersonic flight through rain and dust clouds, simulation of the final phase of high ballistic coefficient reentry, and high Mach number flight at low altitudes.
- Efficient, safe, and cost-effective ground-based tests that provide an alternative to expensive flight and ground-based static tests.

Track testing provides the capability to rigorously define and repeat specific environments and performance envelopes, recover the specimen after the test, eliminating aircrew safety hazards while avoiding costs and delays inherent inflight rating experimental hardware. It also provides comprehensive digital photo-optical video, and electronic data through on-board or telemetry instrumentation. Instrumentation test capabilities include debugging, developmental shakedown, and performance and demonstration under field conditions that provide maximum degree of confidence that the tested items will perform under their specified flight requirements, combat conditions, and environmental constraints without failure or need for subsequent retrofits.

The HHSTT provides customers with an independent, unbiased analysis and evaluation of test results, emphasizing sled and test item performance, validity and accuracy of test data, quality of environmental simulations, and overall suitability and credibility of selected test approaches.

For technology development and for systems test requirements prior to actual flight tests, track testing offers the following advantages:

- The test item trajectory can be tailored for optimum data collection by arranging test events to occur exactly at predetermined points of the flight path, under conditions that allow comprehensive event instrumentation and photographic coverage.
- Airflow field visualization (evaluating the air flow and shockwave interactions) for test objects can be obtained using focused Schlieren photographic techniques.
- Test conditions can be repeated accurately from test to test within closely controlled tolerances.
- The test items can generally be recovered for post-test inspection, evaluation, and possible reuse.
- Short operational turn-around times are achieved, allowing a sequence of consecutive tests consistent with usually tight developmental schedules.
- Track tests can be conducted at a fraction of the cost involved in full-scale flight tests.
- Safety of personnel involved in testing is substantially higher than in full flight tests.

1.3. PURPOSE OF THE PROPOSED ACTION

The purpose of the Proposed Action is to maintain the HHSTT to meet the current and evolving mission of the 846th TS, and to meet client requirements now and in the future. The proposed maintenance and minor modification of the HHSTT operations would allow the 846th TS to be ready for the anticipated increase in demand of its services over the next decade, and continue to provide a safe, efficient, and cost-effective ground-test alternative to expensive developmental flight tests, while protecting human health and the quality of the environment.

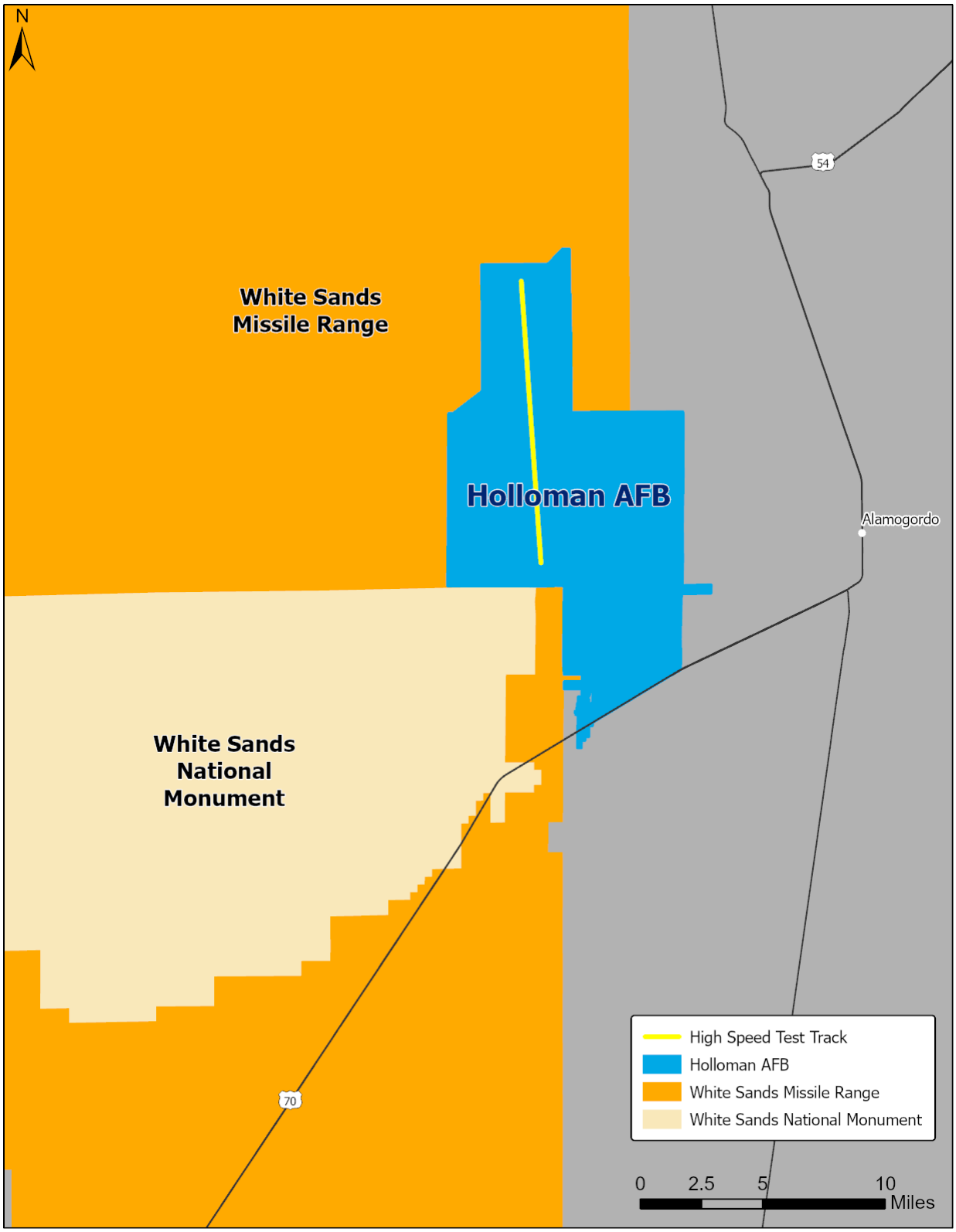

Figure 1. Holloman AFB and Surrounding Area

Need for the Proposed Action

The need for the Proposed Action is to enable the 846th TS to safely continue to fulfill its current mission to "plan and execute world class rocket sled tests that enables critical weapon system development in support of the warfighter". The existing HHSTT has three rails: A and B, which run the entire 50,971 ft length of the facility and a mid-1970s constructed short C-Rail in the northern 15,201 feet of the facility approximately two feet east of B rail forming the narrow gauge (NG) system. These rails and test support structures require relatively continuous maintenance and minor modifications to remain viable and serve test customers. An existing rainfield is used to study the erosive effects of extended supersonic or hypersonic flight through rain clouds on material samples and components of weapons and aerospace systems. The continuing operations of the HHSTT include proposed minor modifications to the rainfield to extend the length and expand the rain erosion testing capability.

1.4. DECISION TO BE MADE

The PEA evaluates whether the proposed actions would significantly affect the quality of the human environment and require preparation of an Environmental Impact Statement or if a Finding of No Significant Impact (FONSI) should be prepared. The PEA evaluates environmental, safety, and health effects associated only with ground-based test and operational activities of the HHSTT at HAFB, as currently implemented, with continued maintenance and minor changes when necessary to address specific test requirements. This PEA is prepared in accordance with the National Environmental Policy Act (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), the Air Force Environmental Impact Analysis Process promulgated at 32 CFR 989, and FAA Order 1050. 1f, *Environmental Impacts: Policies and Procedures*, and other relevant federal and state laws and regulations.

2. Description of the Proposed Action and Alternatives

This section describes the current systems and operations followed by the proposed alternatives considered to meet the purpose and need as described in sections 1.2 and 1.3. Section 2.1 describes the existing HHSTT system and the ongoing tests activities that could impact the natural and cultural resources of HAFB. For technical information associated with test and operation activities, see "*The High Speed Test Track: Facilities and Capabilities*" booklet prepared by the 46th Test Group, 846 TS (September 2006). The alternatives presented in sections 2.2 thru 2.7 represent different means for meeting the purpose, need, and objectives described in Chapter 1. A range of alternatives were developed that includes a set of reasonable alternatives as well as other alternatives considered but eliminated from detailed analysis. A reasonable alternative is one that is technically and economically feasible while meeting the project objectives.

2.1. Description of the Existing High Speed Test Track Facilities

The HHSTT is located in the Tularosa Basin, which is one of the more seismically stable regions in the United States, very rarely affected by earthquakes and tremors, and is well-suited for retaining a high degree of linear straightness. The Track itself is similar to extremely straight and smooth railroad tracks, with a trough for water in between the concrete girders that support the rails that can be dammed off at intervals for holding water to brake sleds. Sleds can be run either on one rail (monorail) or two rails (dual rail: wide or narrow gauge), depending on test requirements. Camera Pad Road runs parallel to the Track approximately 1,000 feet to the east for access to the various areas of the Track and for setting up instrumentation. Support and test facilities at the HHSTT include:

- **Trackside Rain Simulation Facility:** The rain system is used for weather encounter testing and provides a continuous user defined simulated rain environment to assess the performance of large representative samples of test materials up to full test articles. It has the ability to expose the test articles to relatively large amounts of rain with variable drop sizing, in a controlled and characterized test environment. The sled track provides an integrated effects test capability with a continuous or intermittent length of rain field that is currently situated over the west most rail (A rail) between TS 21,300 and TS 27,300. When/if the narrow-gauge rail system is extended to the full 50,971-foot length, the rain field capability will be expanded to cover the narrow-gauge system as well.
- **Ballistic Rainfield (Inactive):** This site was a separate 2,000-foot rain simulation area perpendicular to the Track for testing projectiles fired by guns. This site used ECHO Blockhouse for operating and controlling the rain system and an earthen berm at the west end to stop and retain test projectiles. If the ballistic rainfield is recommissioned, the berm, water delivery, and control system will need to be rebuilt to meet test requirements as needed.
- **Ejection Test Site:** This test site on the Track is used for testing crew escape systems and ejection and release of aircraft weapon systems, by sleds traveling either north or south. The ejection test site starts at TS 27,000 and extends north to TS 29,000.
- **Blast Test Site (Inactive around 1990):** This 5-acre asphalted, and 18-acre stabilized soil site tests blast effects on moving sleds. Up to three 12,000-pound charges have been detonated sequentially in the past. This facility has not been used since 1990 but remains a viable test facility.

Prototype Magnetic Levitation Guideway (MAGLEV) (Decommissioned March 2016): Complementing the existing Test Track, the prototype 2,300-foot-long MAGLEV track provides a low vibration environment for payloads on rocket-propelled, magnetically levitated sleds. In March 2016, the super-cooled, super-conducting magnet technology was deemed not suitable to meet the original intent of reaching Mach 10 and the project was put on an indefinite hold.

- **Four Blockhouses (ALPHA, BRAVO, COCO, and DOG) and Mobile Launch Vehicles:** The ALPHA blockhouse located at the south end of the track provides the capability for launching sleds from the south end of the track, is eligible for listing on the National Register of Historic Places (NRHP), and is no longer used. BRAVO and COCO were originally constructed as launch control facilities but currently are used for storage; DOG is a small building used periodically as a sled launch facility. With the addition of mobile launch control vehicles, sleds can be launched from any location along the Track making the ALPHA, BRAVO, and COCO blockhouse obsolete, and they are not planned to be used for that purpose for the foreseeable future.
- **Track Data Center (TDC):** A multi-story, hardened, air-conditioned, and dust-free telemetry ground station, located 2,000 feet east of the track, has line-of-sight reception from test sleds at all points on the track and is a focal point for track control, data collection and safety operations.
- **Tula Peak:** A staging area for a mobile telemetry ground station and programming centers is in the parking area on the top of Tula Peak, 6,000 feet east of the northern end of the track. This upper parking area also provides a good vantage point for remote camera operations, and a lower parking area provides a suitable area for spectators.
- **Propulsion, Storage, Maintenance and Office Buildings:** These buildings provide centers for installation, maintenance, and storage of solid-fuel rocket motors, munitions, warheads, and other equipment and storage items. Buildings 1180, 1181, 1183, 1179, 1174, 1170, 1166, 1176, 1173, and 1605 (Dearborn), located at the southern end of the Track, provide office space and project working areas. Building 1605 is also used to store plastic sheeting, sandbags, tools, and field equipment.
- **Horizontal Test Stand (HTS) (Decommissioned):** The HTS, located east of the track, designed to test rocket motors and jet engines, capable of a total thrust rating of 1.0 million pounds. A 400,000-gallon water supply tank originally for dissipating static test motor heat is now used as supply and storage for track rainfield or water braking use. This facility is equipped with a large concrete lined pool for cooling rocket blasts. This pool is no longer used because it leaks and is fenced because it can also trap oryx. The rail survey crew uses the control bunker as an administrative area.
- **The Antenna Relay Center (ARC) Building 1625:** The ARC, located east of the north end of the Test Track, is used to control missions at the north end of the Track. It has a helium supply manifold system in the parking lot for helium tanker trailers to pipe helium to the track for tests requiring low atmospheric density. The ARC is a focal point for Track control and safety operations for tests conducted at the north end.
- **Fabrication and Repair Shop Buildings 1166, 1173 and 1178 and associated buildings:** These buildings located near the south end of the track are used for fabricating special sleds, modifying existing sleds, installing special hardware, and making prototypes to meet client test requirements. The facilities include a machine shop, a welding shop, carpenter and wood shop, metal heat treatment shop, bead blast shop, paint shop, non-destructive inspection shop, and a sheet metal shop.
- **Bullpen:** Located in the administrative area, this area provides parking for government vehicles, generators, and aerospace ground equipment. Light cart maintenance is conducted here.
- **North End Concrete Target Fabrication and Storage Area:** This bladed and leveled earthen area at the north end of the Track (between the track and Camera Pad Road) is used for fabricating concrete target wafers. Target wafers are formed, cast, cured and temporarily stockpiled until needed and transported to the end of the track using a mobile gantry crane. Damaged targets are returned to the area just north of the fabrication area and stockpiled until testing is completed, then they are turned into rubble by a contractor; the rebar is recycled, and the rubble is transported to waste disposal sites or recycled. Upon completion of the test, damaged targets that are salvageable are removed and stored to be reused. Targets that are not salvageable are moved to the target demolition area to be demolished. Lifting lugs are picked up

and inspected for reuse and refurbished if possible. The rebar and concrete debris are separated and disposed in an approved manner.

- **Expended Rocket Storage Facility:** Next to Building 1177 is a fenced and hardened holding area for storing expended solid fuel rocket motors pending disposal through Defense Logistics Agency Disposition Services (DLADS).
- **Fuel Storage Area:** Motor Gasoline and diesel fuel is stored and dispensed behind the carpenter shop next to Building 1166.
- **Live Munitions Storage/Operations Buildings 1151, 1152, 1153, 1154, 1165, 1168, 1640, and 1641:** Live munitions are stored prior to use in tests. Munitions buildup activities take place in building 1152 and 1153.
- **Munitions Operating Buildings 1168:** Live munitions are prepared, configured, and mounted for tests in this building.
- **Sled Launch Administrative Building (1189):** This 60ft x 80ft building is located west of Building 1173 in the administrative area south of the Test Track near the boneyard and provides administrative offices facilities for Sled Launch personnel.
- **Sled Storage Building:** Located behind Building 1178, this building stores complex sleds to protect them from deterioration and corrosion caused by exposure to the elements.
- **Sheet Metal Storage Building (Building 1186**): This 50 ft x 100 ft storage building is located south of Building 1178 and stores raw sheet metal indoors to protect it from theft and degradation.
- **Additional Storage Buildings:** Building 1184, approximately 50 feet by 100 feet in size, is used to store metal and welding gas (oxygen and acetylene), tools and equipment, and Track associated hardware and tools, respectively. Building 1604 is also used to fabricate special purpose field equipment.
- **Instrumentation and Vehicle Parking Mounds and Borrow Pits.** Three of these pits and berms are located along the eastern side of the track east of Camera Pad Road are used for placing instruments and parking vehicles, as necessary.

2.1.1. Sled Operations

The vehicles operating on the track are called “sleds” because they ride the rails on steel shoes (“slippers”) that slide over the rails. Depending on test needs, the sleds can be of various sizes and configurations. Except for tests involving destructive explosions or high-speed impacts, the sled and test equipment are recovered for post-run inspection, evaluation, and reuse. When the test involves destructive explosions or high-speed impact, resultant debris are collected for inspection and test result data.

The sleds are currently propelled by solid fuel rocket motors and possibly jet engines in the future, often in multi-stage operation. Solid fuel rocket motors and jet engines are used to meet test velocity requirements along the limited length of the Test Track. Liquid propellant rockets have not been used since 1982 at the Track.

In most cases, costs are reduced by using rocket motors that have been phased out or surplus for other reasons. Modern commercial rocket motors are used only when extremely high-performance requirements exceed the capabilities of surplus motors. From 1963 through 1993, an average of 902 rocket motors were used annually. However, from 1993 through 1999, an average of 190 motors were used annually. From January 2010 through December 2020 an average of 108 motors were expended annually.

Sled operations can involve activities such as carrying explosives, testing ejection seats, shooting lasers, dispensing flares, dispersing bomblets and submunitions, carrying cameras, and ejecting data acquisition systems.

After engine burnout at high speed, the sled is decelerated by its own air drag, which may be augmented by deployable or fixed aerodynamic drag brakes. Deceleration at lower speeds is accomplished by either

letting the sled coast to a stop or using water braking by transferring momentum from the sled to water. For some tests, rather than putting the braking water between the rails in dammed sections, it is located in rail side water channels or in plastic "sausage" bags on top of the rails. Methanol or polyethylene glycol may be used as antifreeze in braking water when needed. Drag straps and arresting straps can also be used to brake sleds at low speeds. Piles of dirt, concrete, scrap wood, sand, and Styrofoam can be used along the track and in the impact area at the northern end of the track for stopping sleds. Retropropulsion, or firing engines in reverse, is also used infrequently. All debris are collected after use.

For dual rail sleds, the braking water is provided in the water trough between the rails. Masonite partitions are used to control the depth of water in the trough and are spaced at intervals to maintain the water depth needed to engage the water brake that is mounted on the sled. The braking force is controlled by adjusting the water height by using the Masonite dams in the trough. The most water used for a single test for dual rail sleds, assuming water is in the track trough for 2,000 linear feet at a depth of 16 inches is 44,500 gallons (5,956 cubic feet). For monorail sleds, braking water is sometimes made more resistant by mixing with a gelling agent and is positioned either on top of one rail or next to the rail in expendable plastic tubes, or in trays. The most congealed water used for a single test was 233.5 gallons (31.2 ft^3); the most water used in plastic bags for a single test was 4,556 gallons (609 cubic feet). The most water used for narrow gauge tests, assuming 2,000 feet with 7.5-inch depth is 9,349 gallons (1,250 ft^3). Methanol or polyethylene glycol may be used as antifreeze in braking water for winter tests.

Water used at the HHSTT is provided from the HAFB potable water system piped from the Boles Wells Water System Annex or from Bonito Lake through the City of Alamogordo. Water is supplied to the HHSTT using a ten-inch diameter water line parallel to the Test Track along the west side, connected to the 846TS water main at the south end of the track. The 10-inch water line is used to supply water for dust control at the north end, the ARC building, the Survey Shop, sled braking water needs, and the rainfield system. The water line supplies water anywhere along the Track as needed for water braking. The water line also supplies water to the 400,000-gallon water tank at the Horizontal Test Stand. This water is also used for watering the impact area at the north end of the Test Track for dust abatement, and other operational uses.

A new water meter was installed in July 2021 on the 10-inch diameter water main to monitor the amount of water used at the test track. The meter recorded the flow of water from August through September (2021) measuring approximately 1.14 million gallons each. This amount of water greatly exceeds the amount typically used by the workforce along the test track, dust suppression efforts at the north end to support target placement, water usage at both the ARC building, Building 1161, and the Survey shop. A water meter at Eagle tank is also used to monitor water usage and to determine if a problem with the water line has occurred, resulting in immediate action required to locate the leak.

A water main break releasing any large amount of water would be quite apparent due to the undermining of the area immediately around the broken line that would occur. It is therefore assumed the leakage is due to the poor condition of the existing water lines, valves, joints, etc. allowing water to leak at very slow rates. The presences of small leaks can easily add up to large amounts of water loss being recorded. The mitigation plan will involve monitoring the water lines and building facilities for leaks.

Missions requiring recovery of test articles may use the water braking method which typically involves filling the water trough and utilizing a series of dams to set the height of the surface of the water within the trough. The amount of water needed for braking mission will vary based on the length of the track to be used to slow down the sleds. The water used for this braking method is a very small percentage of the overall amount of water used to fill the trough. The water brake is set to skim the top of the water surface to be used to dissipate the energy of the sled. The amount of water displaced during the braking of the sled is splashed out over the track and onto the adjacent track road surfaces. Most of the water remains in the trough and is subsequently drained to either a retention basin or sent out on to the ground to either

evaporate or be reabsorbed back into the ground. There are three drains along the test track located at TS 51,000, TS 45,640.297 and TS 20,624.315.

TS 51,000: The drains at TS 51,000 are located between the end of the concrete girder and steel pull down structure. The wide girder trough at the north consist of one 12" x 12" drain (WG) and a pair of 6" diameter drains (NG). The water from these drains is directed out into the west area adjacent to the test track. This water will enter a drainage swale that directs the water out onto the desert where it will either evaporate or be absorbed into the ground.

TS 45,640.297: The drains located at TS 45,640.297 consists of four 6" diameter drainpipes. These four 6" drainpipes are connected to rectangular concrete ditches located on the west side of the test track which are used to transport the water to the existing retention basin also located on the west side of the test track.

TS 20,624.315: The drains located at TS 20,624.315 consists of two 6" diameter drainpipes. These two 6" drainpipes are connected to rectangular concrete ditches located on the west side of the test track which are used to transport the water to the existing retention basin located on the west side of the test track.

A dam consisting of sandbags is placed just south of the drain located at TS 20,624.315 to prevent water within the trough from flowing southward. Any water that does flow southward is evaporated prior to reaching the end of the track which is approximately 3.91 miles.

2.1.2. Data Collection Instrumentation and Processes Conducted

The HHSTT is a versatile track facility, where new and unprecedented applications and tests can be developed and implemented in an efficient, timely, and cost-effective way. The 846 TS maintains an aggressive in-house development program aimed at providing advanced capabilities needed to satisfy more demanding test requirements for existing or foreseen systems. This applies to all areas of track operation, including advanced sled and propulsion hardware, data collection capabilities, techniques for environmental simulation, and methods to increase operational efficiency and cost effectiveness.

Data collection for sled tests frequently uses radio telemetry and onboard instrumentation. Data can be received from multiple receiving stations, such as the TDC, or the mobile telemetry van, which can be located at any location appropriate for data collection. Cameras and other instruments can be set up anywhere along the Test Track, at its ancillary facilities on mobile vehicles or on the ground. Two large dirt mounds have been constructed east of the Track for placing cameras and instrumentation during tests.

Electrical power is supplied to the Track complex and the HTS by buried conduits and overhead pole mounted power lines. The Track's microwave installations link the TDC and multiple locations along the track as well as Tula Peak. Blockhouses ALPHA, BRAVO, COCO, and DOG which are equipped with power supplies, control panels, and recording and communication equipment for launching sleds. ALPHA, BRAVO, and COCO blockhouses are no longer used for track control operations; instead, the Track has mobile launch control vehicles that provide the same capabilities as the blockhouses. These can launch sleds and fire rockets from almost any location along the east and west sides of the Track.

Photo-optical instrumentation is a primary means of data collection for all tests involving dynamic flight events, such as ejection, release, impact, and body separation. Test item trajectories can be calculated to occur at precisely predetermined points in time and space, allowing comprehensive coverage by ground-fixed cameras within the best possible field of view and under optimum lighting conditions for each camera. Cinetheodolite-type metric cameras and/or laser tracking equipment are used for aircraft flight trajectories exceeding 500 feet above ground level.

A total of 79 permanent optical instrumentation sites are located along Camera Pad Road, a line that parallels the Track, approximately 1,040 feet east of the centerline. Each camera position relates a sled and test item position to precisely surveyed target poles, five to seven of which are within the field of view of each camera station. Each permanent camera site is equipped with commercial power connected with a central control station, permitting remote operation of all metric cameras. Mobile stations for metric cameras can be located at various optical sites, using mobile power generators. Mobile cameras on flatbed trailers can be set up anywhere along the Track, sometimes in concrete bunkers moved into place by mobile cranes or from existing roads and earthen camera mounds. Cameras are often set up near the roads in the desert, mostly within 50 feet of the Track.

Trackside motion picture coverage is available to provide close-up magnified observations of programmed events such as ignition, flame pattern, operation of onboard test items, ejections, and impacts. Image Motion Compensation photography, which synchronizes image motion with sled motion to make the sled appear stationary in each photo, is used in rain and particle erosion tests and other high velocity tests. Focused schlieren photography can also provide clear pictures of shock wave patterns around sleds at supersonic speeds. Small, rugged, onboard cameras can record functioning of crew escape systems, separation of ejected weapons from the launcher, and deployment of parachutes. Aerial photography can be obtained using helicopters. Infrared photography, flash X-ray photography and documentary photography using both still and motion pictures are also used.

Data collection at the north end of the Track can involve evaluating size and velocities of impact debris using ground-based radar and cameras. The dispersion of biological simulants can also be evaluated by putting collector containers in holes dug into the ground (up to 150 have been installed in the past) at the target area at the north end. Small radio-controlled drones can be used to collect airborne samples of biological and chemical simulants.

Debris created by explosive or impact tests is sought out and recovered, sometimes miles from the end of the north end of the track, by up to thirty (30) individuals walking systematically in a predetermined grid to a maximum of about 600 meters on each side of the track centerline and extending as far as three miles north of the north end of the Track. Vehicles may also be used for debris collection. The impact area beyond 1,000 feet north of the Test Track is located on land under the jurisdiction of the White Sands Missile Range (WSMR) and used for HHSTT operations by agreement. Impact sites on WSMR are surveyed for natural and cultural resources by 49 CES/CEIE. Recovery efforts that involve trucks or heavy equipment and excavation are monitored by 49 CES/CEIE. Typically, debris is flagged and collected by personnel in small, mechanized vehicles, and the site catalogued using Global Positioning System (GPS) equipment. Any debris created by a failed test at any point along the Track is collected by personnel on foot and in small, mechanized vehicles at the point of the mishap.

2.1.3. Tests Conducted at HHSTT

The types of tests conducted at the HHSTT are described in detail in this section. All airspace within 5 miles of the track from the surface to 20,000 ft MSL is coordinated with the local airfield, WSMR, and/or White Sands National Park. The HHSTT maintains an Operational Requirements (OR) with WSMR for coordinating airspace and other resources used for sled testing. Current OR is 36918 Rev 2, dated 30 November 2017. All tests that use water are identified in the description and summarized in Table 1 at the end of this section.

2.1.3.1. Hypersonic Aerodynamic Testing

These tests involve realistic simulation of the flow of air and shock waves encountered at speeds five times faster than the speed of sound (high Mach number tests) at low altitudes, with realistic model sizes and test times above the millisecond range under controlled conditions. The intent is to move the sled at as high speeds as possible, stop the sled, then recover it, using the entire length of the track. “High Mach number tests” involve sled runs intended to achieve or sustain a specified Mach number at low altitudes

and the effects directly related to it. Models are mounted on sleds and retrieved intact at the end of the test. The existing C-rail (narrow gauge) girder and track was extended 5,000 feet farther north of existing Track Station 15,200 to Track Station 20,200 in FY 2000 to FY 2001. Extending the existing C-rail to Track Station 20,200 and upgrading the existing system, provided the capability for conducting the Hypersonic Aerodynamic testing. Tests requiring extremely high speeds (greater than Mach 6) that are currently conducted on a monorail track can be conducted on this extended track if recovery is not desired.

The air and shock wave flows are recorded by ground-fixed optical instrumentation using focused Schlieren photography cameras. Some tests are conducted in a helium atmosphere to reduce friction and allow greater speeds. Helium is piped from the ARC building for a particular test, and the helium is released to the air after test completion.

Sonic booms may rattle windows and can often be heard under typical atmospheric conditions as far away as Tularosa and Alamogordo. Approximately four hypersonic tests generating sonic booms are conducted per year. These tests are often conducted at night when the winds are minimal, and the risk of bird strikes are lower. No water is used for these tests.

2.1.3.2. Crew Escape Systems

Ejection seat, extraction seat, and crew module escape system tests include developmental, qualification, and compatibility tests. Tests are conducted using specially designed sleds that closely simulate the aerodynamics of aircraft; crew members are simulated using anthropomorphic dummies. Tests are conducted from zero airspeed up to 600 knots equivalent air speed.

On-board instrumentation, telemetry, cameras, laser trackers, and data recorders; and fixed and mobile ground tracking cameras are used to collect data on escape system function, separation of the seat or module from the sled, and separation of the dummy from the seat or module, linear acceleration and human tolerance, angular velocity, blast, and trajectory of the escape system. Cameras may be located from 15 feet from the centerline of the Track up to 3,000 feet from centerline at any location along the Track and on the earthen camera mounds. Modules, dummies, and any resultant debris are retrieved.

Approximately 14 tests are conducted per year.

2.1.3.3. Rain Erosion Testing

Rain erosion testing is conducted to study the erosive effects of extended supersonic or hypersonic flight through rain clouds on material samples and components of weapons and aerospace systems. The Track can simulate a wide range of combinations of specific rain environments and flight conditions along a 6,000-foot section of track which is equipped with a parallel trackside sprinkler system over the rail to produce simulated rain environments with specified rain rates and droplet size distributions.

The sled test items (e.g., warheads, radar covers, inlet diffusers, material samples) are mounted high and forward on the sleds to be unaffected by sled-induced flow-interference or reflected shock waves. Data are collected by extensive photographic coverage of the sled test specimen while traversing the rain environment, and by evaluation of the recovered test specimen. Most of the cameras used for data collection are located on roads east and west of the Track approximately 20 feet to 30 feet from the Track centerline. A few may be located off road in the desert.

The water for rainfield test operation is supplied by the 400,000-gallon tank at the HTS (see Table 1). The maximum quantity of water for a single test would be about 250,000 gallons (33,400 ft^3), including calibration checks and the test itself. When a test is completed, the water which has not evaporated or been splashed out of the rails is drained to the existing curb and gutter system on the east and west sides of the Track side roadways. The curb and gutter system directs both test and stormwater runoff to existing concrete ditches located on both sides of the Track and then to catchment areas or retention ponds.

Depending on test requirements, rain erosion tests have been conducted at speeds up to Mach 6. On average, fewer than one test, lasting a few seconds, is conducted per year. This type of test is sparse and cyclical with 26 tests conducted between 1998 and 2020 and four tests expected in 2022. Each test creates a sonic boom.

2.1.3.4. Ballistic Rain Testing (Inactive)

The Ballistic Rainfield in Hay Draw is a specialized facility for firing munitions, ranging from 105 mm rounds to projectiles from field weapons, through simulated rain environments for developmental test and evaluation activities and for qualification of artillery fuzes. The munitions are fired to the west and projectiles are stopped by a target bunker. This site can be used without interfering with preparation of other Track tests. However, this type of test has not been conducted for 20 years. Ten to twelve test sessions were conducted between 20 and 40 years ago, during the Vietnam War, with each session composed of firing three to four rounds.

Data were collected using photo-optical instrumentation set up parallel and 300 feet south of the Field on either dirt roads or tripods. All shell casings were collected and recycled after each test. A large portion of the projectile debris accumulated in and around the target bunker (a dirt embankment) has been cleaned-up and removed by the Military Munitions Response Program. Further use of this site would require rebuilding the target bunker.

This type of test is less in demand with recent military action occurring in more xeric conditions. A maximum of 190,000 gallons (25,401 ft^3) of water are used per test, delivered by the same water system for the rain erosion testing (Section 2.1.3.3). The water infiltrates into gravel on site during the test. A shock wave is created by this test.

2.1.3.5. Dust and Particle Erosion Testing

These tests evaluate a wide range of erosion problems that occur during weapons and flight systems operation due to the effects of hail, water drop, dust, and/or particle impacts at supersonic speeds. Particle impact tests at speeds up to Mach 6 are conducted on a routine basis. Speeds may be increased using helium atmosphere (Section 2.1.3.1).

Data are collected by photo-optical instrumentation from ground-fixed cameras and by recovery of the test specimen, similar to that described in the Ballistic Rain Testing (Section 2.1.3.4).

The impact of individual particles on models at supersonic and hypersonic flow and heating conditions is studied by suspending the particles on very fine nets for interception by the sled. The impact of individual water drops is studied by coordinating the sled trajectory with the water drops falling by gravity. The individual water droplets are produced by the rain field sprinkler system. When a test is completed, the water which has not evaporated or been splashed out of the rails is drained as described above, to evaporate or infiltrate.

The impact of ice crystals and particles is studied by freezing water droplets in molds onto threads within containers placed over the track. The containers are refrigerated and have doors that open just before the sled arrives.

Depending on customer requirements, tests may be conducted in an atmosphere of helium, carbon dioxide, or a vacuum. All such tests generate a sonic boom. Less than one of these tests is conducted per year—the last one conducted 25 to 30 years ago, used about 100 gallons of water (13ft^3).

2.1.3.6. Impact Testing

Dependent upon test objectives, high velocity impact tests are generally conducted at the north end of the track, with the payloads varying from less than one pound to 30,000 pounds in weight. High velocity tests involve sled runs conducted at specified impact speeds between the test item and target. Typically, the payload is carried by the sled to impact a stationary object. Occasionally, the payload is stationary with

the target mounted on the sled. The existing C-rail (narrow gauge) girder and track was extended 5,000 feet farther to the south of TS 15,200-foot track in FY 2000 to FY 2001. That extended the existing C-rail to 20,200 feet and upgraded the existing system to provide capability for conducting hypersonic impact testing. Tests requiring extremely high speeds (greater than Mach 6) that are currently conducted on a monorail track can be conducted on this extended track if recovery is not desired.

Tests conducted for the Theater Missile Defense Lethality Program (6a in Table 1) to date have varied from a 6,800-pound high explosive submunitions and biological simulants being impacted at 330 feet per second to a 42-pound payload being impacted at 8,978 feet per second, Defense against warheads is accomplished by intercepting theater missiles and delivering enough energy at impact to "kill" a warhead before it can deliver its payload to its designated target. The results of testing activities determine the kill mechanism types and magnitudes required for destroying ballistic, cruise, and air-to-surface theater missiles armed with conventional, chemical, biological, and nuclear warheads.

Tests use explosive materials, including aluminum, PBX 9404 (a common, sensitive, high-explosive material consisting of 94% cyclotetramethylene tetranitramine (HMX), 3% nitrocellulose (NC), and 3% 2-chloroethanol phosphate (CEF), and Composition B (a common high explosive composed of 60% cyclonite (RDX) and 40% trinitrotoluene (TNT)). RDX is one of the most powerful high explosives in use, with more shattering power than TNT. Tests can also use non-explosive materials, such as silica phenolic (a fibrous silica fabric bonded with epoxy that can be machined into variously shaped and sized components), steel, Lexan, and Lucite plastic.

Generally, less than three live explosive impact tests are conducted per year, and each test would use 2,561 gallons (342 ft3) of water to stop the pusher sled from leaving the north end of the track.

The analysis of the tests on specific simulants at each test site, including the HHSTT, is included in the Programmatic Environmental Assessment for the Theater Missile Defense Lethality Program, U.S. Army Space and Strategic Defense Command, Huntsville AL, August 1993 (FONSI signed 27 July 1993). No other explosives and simulants are expected to be used for HHSTT tests. Therefore, no additional analysis is included in this PEA.

The Deep Penetrating Warhead Tests (6b in Table 1) involve up to 8 targets, each as large as 300,000 pounds, constructed of materials ranging from water to armor plate and concrete. The northern portion of the track is curved downward so that the pusher sled impacts dirt berms, and the rocket motors go into dirt trenches at the end of the Track rather than the target. This type of test has the warhead penetrate stacks of heavy concrete targets. The bomb can either penetrate, stay in the concrete, or go completely through the stacks of concrete. Each type of test requires a different protocol for recovery and cleanup.

For specific test objectives, a 10,000-foot artificial atmosphere of helium in a sealed plastic tunnel can be installed to reduce aerodynamic heating and drag just prior to high velocity impact (Section 2.1.3.1). After the test, debris from the payload, target, or both are collected by up to thirty test personnel walking up to three miles north of the impact site and approximately 600 meters to either side of the centerline of the track. Vehicles may also be used for debris searches. Data are also collected by photo-optical and electronic methods, including X-ray photography, using cameras located trackside or as far away as Tula Peak. Cameras along the track are protected from blast debris and shockwaves by movable concrete bunkers.

Approximately 12 inert penetrator tests are conducted per year, with each test creating a sonic boom. Six to eight of these tests use the narrow-gauge rails and approximately 2,561 gallons (341 ft^3) of water for braking the pusher sled, for a total of 20,488 gallons (2,732 ft^3) per year. The remainder of the tests do not use water.

2.1.3.7. Dispenser System Testing

These tests involve determining launch patterns by launching rocket-powered weapons, dissemination of bomblets or flechette (needle bombs), aircraft attachment or sensor cover hardware, and dissemination of powder-like stimulant substances from moving sleds. These tests also include crosswind firings of aircraft weapons and missiles and testing of weapons delivery platforms. Aircraft weapons can be launched vertically from the moving sleds as well as by firing missiles from the sled-borne launchers at preselected sites. The Air Launch Sled can carry 900 pounds of externally mounted pods and can launch them at velocities of up to 1,700 feet per second. The adjacent WSMR beyond the north end of the Track provides an unobstructed, uninhabited, highly instrumented free-flight test range of 50 nautical miles. Dispense speeds of up to Mach 3.0 with payload weight of up to 1,000 pounds have been tested. Both dual-rail and monorail sleds are used.

Carbon dioxide may be used as artificial atmosphere within a plastic tunnel. The shredded plastic is recycled following test completion.

Data are collected with photo-optical instrumentation and by collecting and sampling dispersed articles. Cameras are located as needed along the east and west sides of the Track at some distance to avoid damage from debris. Search for debris is conducted on foot.

On average, less than one test is conducted per year, with each test creating a sonic boom. Each test may use water braking and, when used, the test requires approximately 44,550 gallons (5,456 ft^3) of water. When a test is completed, the water which has not evaporated or been splashed out of the rails is drained to the south end of the Track and into the Lost River Playa through the storm water system, or to the north end of the Track, where it evaporates or infiltrates.

2.1.3.8. Guidance Testing

Track testing of weapons guidance systems closely simulates the typical acceleration profile of an actual missile flight. It allows recovery of the payload, practically unlimited onboard data acquisition equipment, and a highly accurate reference instrumentation system. Guidance sled runs can be deliberately tailored to promote, for example, the growth of specified errors to allow the most comprehensive evaluation and correction of errors and design deficiencies. Sled-tested missiles include the Titan II, Minuteman, Saturn, NATO's Penguin, Peacekeeper, Small Missile, and Trident.

Track testing also evaluates the ability of the terminal weapons guidance system, such as for the SM-2 and Lance systems, to lock onto a real or simulated target in an environment that approximates an actual missile launch, as well as evaluating subsystems and weapons components such as gyroscopes, computers, avionics systems and flight control systems. The electro-optic seeker can be either laser-based or infrared, and the systems use GPS.

These tests require minimal camera coverage, and cameras are located appropriate to the test. These tests are sparse but are regaining use due to current ICBM upgrades, with each test capable of creating a sonic boom. Each test uses approximately 44,550 gallons (5,956 ft^3) of water. When a test is completed, the water which has not evaporated or been splashed out of the rails is drained to the south end of the Track and into the Lost River playa through the storm water system, or to the north end of the Track, where it evaporates or infiltrates.

2.1.3.9. High Gravity Testing

High-gravity testing involves subjecting payloads to specified closely controlled and monitored levels of linear acceleration and/or deceleration. While acceleration is limited by the availability and expense of suitable rocket motors, deceleration is achieved with controlled water braking. Methanol is added to the water during freezing conditions; the methanol evaporates rapidly. Producing extremely high-gravity conditions for a few milliseconds is accomplished with a controlled collision between a test item on a stationary sled and a hammer sled traveling up to 300 feet per second.

These tests are conducted near the northern end of the Track. Cameras are placed in concrete bunkers in locations appropriate to the test location. Less than one test is conducted per year, with each test using 44,550 gallons (5,956 ft^3) of water. Each test would create a sonic boom.

2.1.3.10. Aerodynamic Testing

These tests substitute for, and augment, wind tunnel studies when test items are larger than available wind tunnels, when wind tunnels cannot meet test requirements, or when tests would be impaired by uncertainties associated with wall effects and noise. Aerodynamic tests are accomplished with monorail sleds designed to counteract aerodynamic lift loads, minimize shock strength, avoid interacting shock waves, and prevent ram air from entering the slipper-rail gap. Sled runs provide a simultaneous occurrence of specific Mach number-related flow and heating conditions within a set of specific environmental conditions. High speeds are created in artificial atmospheres using helium or semi-vacuum conditions.

Typical tests include pressure distribution on full-scale wing sections and aerodynamic buffeting studies on scale models. Data are collected by focused Schlieren photography and photo-optic instruments on the test sleds and located at least 30 to 50 feet from the track in test-appropriate locations.

This type of testing is sparse. Each test uses 2,561 gallons (342 ft^3) of water and would create a sonic boom.

2.1.3.11. Aeropropulsion Testing

Aeropropulsion testing in a supersonic low-altitude setting was developed to test air-augmented propulsion concepts on components, subsystems, and complete propulsion units under ground-level conditions at speeds of Mach 3. The track is well-suited for duplicating supersonic flight in dense air at low altitude and for providing realistic conditions for full-scale free-jet testing under various angles of attack. These tests evaluate the air inlets of engines for component compatibility, inlet performance, and internal aerodynamics in a completely assembled engine.

Data are collected by onboard telemetry, and camera instrumentation is located approximately 30 to 50 feet from the Track at test-appropriate locations. Only a couple of tests have been conducted, and each test has created a sonic boom. These tests do not require water for braking or other uses.

2.1.3.12. Aerodynamic Decelerators

Aerodynamic decelerators, such as parachutes and ballutes (small parachutes) are routinely tested on the Track at speeds up to 3,000 feet per second (approximately Mach 2.7). Data collection is mostly through onboard and ground-based metric cameras located approximately 1,000 feet from the centerline of the Track.

This type of testing is sparse, and each test can create a sonic boom. No water is required for this test.

2.1.3.13. Explosive Blast Testing

Blast tests simulate an explosive blast interception on full-scale re-entry vehicles and on components of aircraft, missiles, and aerospace systems during supersonic or hypersonic flight. Most blast tests are conducted in a designated blast area. Some tests are conducted in the impact area and the decommissioned Explosive Ordnance Disposal site (EOD) range at the north end of the Track.

Blast tests on the Track involve two different kinds of missions: captive tests and free-flight tests. Captive tests involve exposing a sledborne test item “side on” to the environment generated by detonation of explosive charges, and subsequently recovering the sled and test item for evaluation. Captive blast tests of 30-pound payload items at speeds of Mach 3 through blast waves generated by charges of up to 4,000 pounds of TNT have been conducted without damage to the facilities. Large full-scale payloads, including a cruise missile, have been tested in environments created by charges of up to 10,000 pounds TNT equivalent at distances of several hundred feet from the intercept point. For shock-on-shock interaction

studies, vehicles have been operated at speeds of Mach 5 through blast waves having up to 12 pounds per square inch free-field overpressure at the intercept point.

Data are collected using focused schlieren photography at the test site, with 60- to 1,000-foot offset, and with still cameras mounted on-board the sled and alongside the Track.

Free-flight tests involve the test item separating from the sled in free flight prior to being subjected to the blast environment at the north end of the Track. Recovery of the test item is not attempted. Tests have been conducted with 350-pound test items traveling 5,000 feet per second and free-field overpressures up to five pounds per square inch.

Test items can also be subjected to the blast within gas bags or polyethylene tubes filled with high density gas such as R-134 after separation from the sled.

Most tests cause sonic booms due to extremely high speeds. Test Track personnel conduct a computer simulation based on atmospheric conditions to determine if damage could occur in Alamogordo and Tularosa; if so, the test is not conducted until atmospheric conditions are more favorable.

This type of testing is extremely sparse, with each test using 44,550 gallons (5,956 ft^3) of water.

2.1.3.14. Launch into a Free Flight Trajectory

These tests involve simulated aircraft launch of experimental missiles, including missile propulsion and missile guidance and homing systems. Aircraft weapons can be launched vertically from the moving sleds as well as by firing missiles from the sledborne launchers at preselected velocities. The Air Launch Sled can carry 900 pounds of externally mounted pods launched at velocities of up to 1,700 feet per second. The adjacent White Sands Missile Range beyond the north end of the Track provides an unobstructed, uninhabited, highly instrumented free-flight test range of 50 nautical miles.

Test data of the launch and separation dynamics is collected using photo-optical cameras and onboard instrumentation, including laser ranger tracking cameras.

This type of testing is extremely sparse, and each test can create a sonic boom. Sleds would be braked by natural, physical, or water deceleration depending on the test requirements.

2.1.3.15. Static Tests on HTS (Decommissioned)

Static propulsion tests involving primarily rockets and jet engines are occasionally conducted at the HTS located adjacent to the Track to the east. The HTS was rated for a nominal maximum thrust of 1,000,000 pounds. The structure includes facilities for engine-mounting, a thrust absorption area, and monitoring and sensing instrumentation. Data collection instrumentation includes strip-chart recorders, oscillographs, and telemetry.

The HTS was primarily used to test performance degradation on surplus rockets used for tests, or by clients for meeting other test objectives for tests such as those involving electronic countermeasures and missile warning systems.

The HTS was equipped with a water deluge system and large concrete holding pool to cool the test stand, dissipate rocket heat, and capture spilled fuel from liquid-fueled rocket motors. The Track no longer uses liquid-fueled rocket motors, and the deluge system has been dismantled. The deluge system and the pool were last used in the 1980s. Before the deluge system and the pool can be used again, a Notice of Intent to discharge to the land surface must be submitted to the state of New Mexico (20 NMAC 6.2). The 400,000-gallon water storage tank at the HTS was initially used to supply water to the deluge system. The tank is no longer used for the deluge system, but it is used to feed water to the rainfield area on the track.

2.1.3.16. Prototype Magnetic Levitation Guideway (MAGLEV) (Decommissioned)

The 2,300-foot prototype Magnetic Levitation system is the first phase of the Hypersonic Ground Test Facility at HAFB. The upgrade to the existing Test Track uses strong magnetic fields to allow a rocket-

propelled sled to "float" in its guideway to create a low vibration environment at speeds up to Mach 10. Tests requiring low-vibration environments, such as delicate electronic systems and/or simulated high-altitude flights at extremely high speeds can be conducted on the ground at lower risk and lower cost. When fully operational, the system could also have capability for electromagnetic propulsion and braking. The prototype did not have the desired performance and was decommissioned after a sled departed the track and was severely damaged in 2016.

This PEA does not include analyses and decisions for the MAGLEV, which has been evaluated in Environmental Assessment—Magnetic Levitation System Installation and Operation at Holloman High Speed Test Track, HAFB, New Mexico, FONSI signed January 26, 1996. Pertinent information is incorporated by reference into this PEA. If the system is revived, the proposed tests will undergo appropriate analysis and documentation pursuant to NEPA.

2.1.3.17. Flare/Chaff Countermeasures Test

These tests involve evaluating the effectiveness of aircraft/missile radar and infrared countermeasures systems against various threats. The countermeasure test components can include chaff, flares, lasers, and other electronic systems, aircraft, missiles, and helicopters. The countermeasure tests typically involve a helicopter or other aircraft flying over a predetermined marked drop zone, or sled-mounted missiles, anywhere along the Track. However, countermeasure materials can also be dispersed from moving sleds as well. Any tests involving flares incorporate fire prevention into the test plan.

Cameras are placed over a wide area to track the dispersal of the chaff, and trajectory of the flares, sleds, and aircraft.

This type of testing is sparse, with each test capable of creating sonic booms. Sleds are braked using either coast down or physical methods, requiring no water use.

2.1.3.18. Miscellaneous Tests

A wide variety of other tests have been conducted on the Track at extremely low tempos, with some tests only conducted once, such as:

- testing of miss-distance indicators,
- structural response and flutter behavior of plastic fins,
- the use of explosive bolts for cutting wires,
- operational characteristics of undercooled rocket engines under dynamic conditions,
- structural behavior of large undercooled cryogenic tanks under acceleration and associated vibrations, and
- "soft catching" artillery shells by firing the shells at a low relative velocity into a sled for evaluating the effectiveness of the shell fuzing mechanism.

Approximately four miscellaneous tests are conducted per year, with half of those typically creating a sonic boom. Two tests also typically use approximately 44,550 gallons (5,956 ft^3) of water for braking, for a total of 89,100 gallons (11,912 ft^3) per year. When a test is completed, the water which has not evaporated or been splashed out of the rails is drained to the south end of the Track and into the Lost River playa through the storm water system, or to the north end of the Track, where it evaporates or infiltrates.

Doppler radars are used on almost every test. Prior to use, a light on the radar is illuminated and an announcement is made over the test track radio system to ensure that all personnel are evacuated from the radiation hazard zone of the particular radar. Radars are triggered remotely and run for less than 120 seconds; typical run time is less than 20 seconds.

Table 1. Volume of Water Used for High Speed Test Track Tests

Test Name	PEA Section	Number of Tests/Yr	Water Volume (gallons per test/ft^3 per test)	Water Volume (gallons per year/ft^3 per year)
Hypersonic Aerodynamic Testing	2.1.4.1	4	0	0
Crew Escape Systems	2.1.4.2	14 (5 with water)	44,550/5,956	222,750/29,779
Rain Erosion Testing	2.1.4.3[1]	<1	190,000/25,401	<190,000/<25,401
Ballistic Rain Testing	2.1.4.4[1]	<1	190,000/25,401	<190,000/<25,401
Dust and Particle Erosion Testing	2.1.4.5[1]	<1	100/13	<100/<13
Impact Testing: missile Defense Lethality Program	2.1.4.6a	3	2,561/342	7,683/1,027
Impact Testing: Deep Penetrating Warhead	2.1.4.6b	12 (8 with water)	2,561/342	20,448/2,732
Dispenser System Testing	2.1.4.7	<1	44,550/5,956	44,550/5,956
Guidance Testing	2.1.4.8	1	44,550/5,956	44,550/5,956
High Gravity Testing	2.1.4.9	<1	44,550/5,956	<44,550/5,956
Aerodynamic Testing	2.1.4.10	6	2,561/342	15,366/2,054
Aeropropulsion Testing	2.1.4.11[1]	<1	0	0
Aerodynamic Decelerators	2.1.4.12	<1	0	0
Explosive Blast Testing	2.1.4.13	<1	44,550/5,956	<44,550/5,956
Launch into a Free Flight Trajectory	2.1.4.14	<1	0	0
Static Tests on HTS	2.1.4.15	0	0	0
Magnetic Levitation	2.1.4.16	0	0	0
Countermeasures Testing	2.1.4.17	7	0	0
Miscellaneous Tests	2.1.4.18	4 (2 with water)	44,550/5,956	89,100/11,912
Total Volume Used for Tests/Year[2]			655,083/87,577	
Maximum Total Volume Used for Tests/Year[3]				905,804/122,145

[1]Tests have not been conducted for many years, but it is possible that they may be requested by clients in the future as military needs change.

[2]Volume without water from tests identified in footnote 1.

[3]Volume assuming one test per year from tests identified in footnote 1 and one test per year for tests conducted less than once per year.

2.1.4. Munitions Used at HHSTT and Associated Explosive Arcs

2.1.4.1. Munitions

Live munitions are used for impact and explosive blast tests. The 49 CES/CED is responsible for disposing of waste munitions for all munitions users at HAFB, including the 704 TG. With the exception of the asbestos in used NIKE booster rocket motors, there is no indication of hazardous materials that would preclude local disposal of 704 TG munitions.

The NIKE booster rocket casing linings contain asbestos. In the past, the NIKE casings were sold to recyclers; the casings are now sent to DLADS, which ships them to a Resource Conservation and Recovery Act (RCRA) permitted treatment/storage/disposal facility. Other rocket motor casings do not have asbestos and are recycled by DLADS. All live rocket motors that have malfunctioned are disposed of by 49 CES/CED.

No radioactive source materials or nuclear munitions are permitted for use at the HHSTT. Obtaining a license for use of such materials requires a 5-year lead time, but radioactive source materials are not being considered for future use.

2.1.4.2. Explosive Arcs

The Test Track has the following explosive safety arcs (Quantity Distance; Q/D) in place (Figure 2):

- The Quantity Distance for the HHSTT impact area currently sited for 3,525 pounds Net Explosive Weight (NEW) is 4,992 feet from centerline, within which unrelated facilities, personnel, and resources are prohibited during active tests.
- The Quantity Distance arc for the HHSTT cited for 30,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the remaining length of the HHSTT is 1,250 feet from centerline, within which unrelated facilities, personnel, and resources are prohibited during active tests.
- The Quantity Distance for the explosive storage Building 1151 toward the south end of the HHSTT, sited for 120,000 pounds (NEW) is 2,064 feet.
- The Quantity Distance arc for the explosive operating Building 1152 toward the south end of the HHSTT, sited for 30,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for explosive tear down and build up Building 1153 for 30,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for Building 1165 for 120,000 pounds (NEW) is 2,063 feet.
- The Quantity Distance arc for the explosive storage Building 1177 for 15,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the Explosive Operating Location Building 1169 sited for 8,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the Explosive Operating Location Building 1168 sited for 5,618 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the Explosive Storage Location Building 1640 sited for 1,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the Explosive Storage Location buildings 1640a, 1640b, 1641a, and 1641b sited for 2,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the MAGLEV sited for 30,000 pounds (NEW) is 1,250 feet.
- The Quantity Distance arc for the HTS sited for 3,000 pounds (NEW) is 1,250 feet.

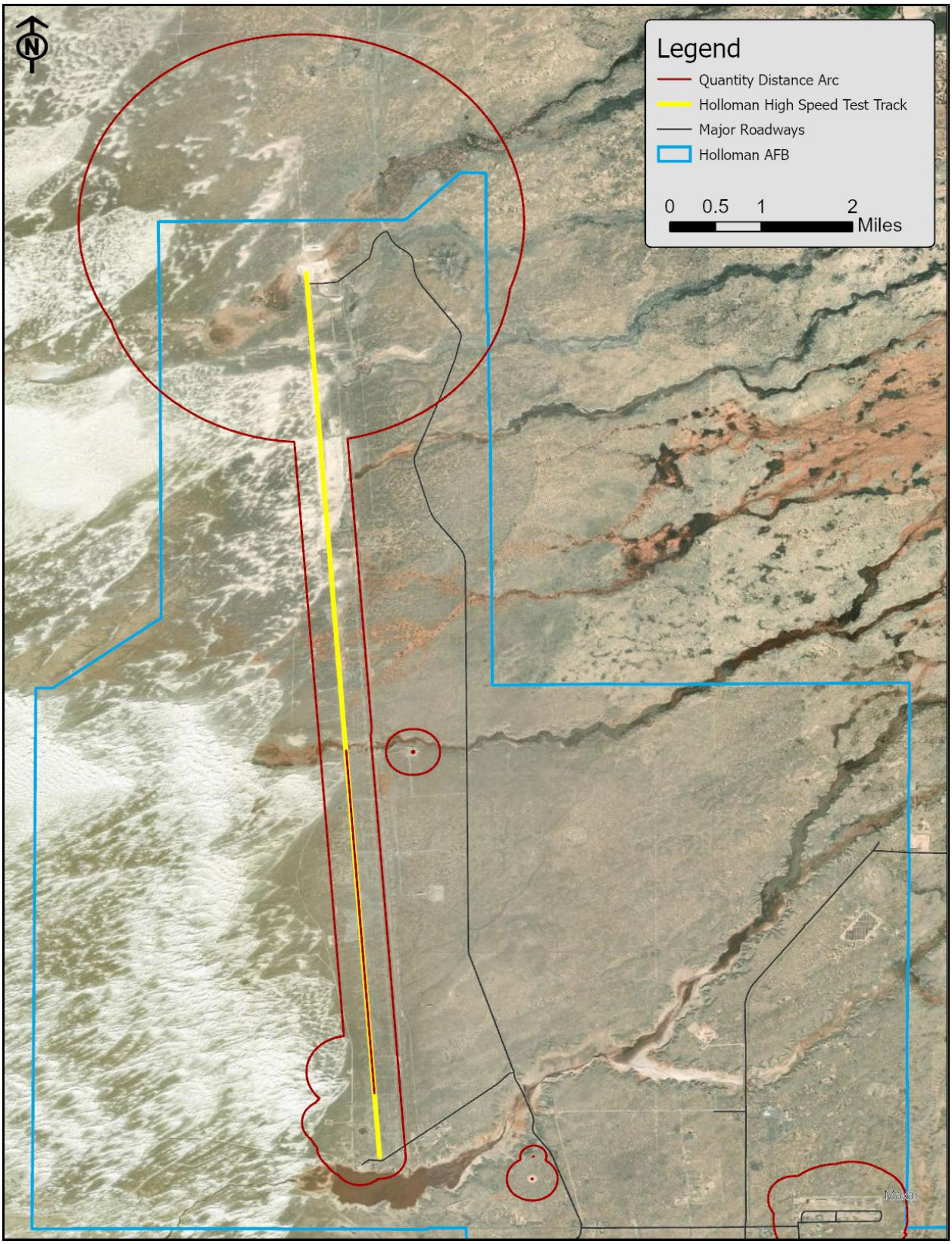

Figure 2. HHSTT Explosive Safety Arcs

2.1.5. Support Operations and Infrastructure

2.1.5.1. Road Network

Numerous primary, secondary, and tertiary roads, and off road "two tracks" service the Test Track area. The primary roads are Range Road 9, which parallels the track approximately one mile to the east, and Range Road 10, which runs east-west south of the Track. Several paved secondary roads provide immediate access along the entire length of the Test Track. These include Camera Pad Road, a road that parallels the track approximately 1/3 mile east of the track. Either side of the track is also paved, East and West Stapp Roads, which act as roadway to service the Track. Additionally, several paved roads run between the Test Track and Camera Pad Road. Another unnamed secondary dirt road about ½ mile west of the track also parallels the track for most of its length. Numerous tertiary dirt roads access the track and its ancillary facilities. Additionally, numerous unauthorized "two-track" roads crisscross the native vegetation. The roads servicing the Test Track have been repaired, including drainage problems.

Test Track personnel can use any of the primary, secondary, or tertiary roads for Track maintenance and repair, and for test preparation, operations, and post-test evaluation. If a test fails anywhere along the Track, vehicles may be used off-road to conduct an evaluation and collect debris. Vehicles may also go off-road in the immediate area of sled operations to place and operate data collection instruments for tests and to harass oryx into moving out of critical test areas immediately prior to a test.

Mowing five feet from the road edge along the rights-of-way is conducted along the eastern and western roads parallel to the Test Track, including Camera Pad Road, by the 846 TS about three times during the growing season. Normally, no mowing is conducted in the winter, but could be if required.

2.1.5.2. Dunes Management

Dunes west of the Test Track north of TS 35,000 naturally encroach on the western road and the Track itself and must be removed by blading when necessary; generally, annually. Dunes also encroach onto Camera Pad Road east of the Track every couple of years and must be bladed and removed. All dune material bladed from the roads is deposited in an approved relocation site. This area was selected by the base Ecologist and was surveyed and approved by the base Biologist and Archaeologist. It is an area of natural dune downwind deposition and scouring. The materials removed from the track areas and deposited on this site are exclusively the natural dune sand of the region. It is located in the dune area east of Camera Pad Road (Figure 3). This blown in dune sand blading is conducted along the Track and within the road right-of-way (out to about six feet from the edges of the pavement.

Dune "topping" is also occasionally conducted to keep the powerlines west of the Track twelve feet to eighteen feet above the ground to meet National Electrical Code and avoid electrical arcing. When needed, dunes are also "topped" immediately west of the track to provide line-of-sight for certain tests and east of the track to restore camera tower line-of-sight to the track; all sand is simply pushed to the side or hauled a short distance to the approved sand disposal area. This is in an area of active dune movement, and no stabilizing vegetation is removed by blading.

2.1.5.3. Track Alignment and Repair

The Track must be constantly realigned and repaired to ensure that it meets the precise needs of test activities. Realignment involves welders, air compressors, solvents and lubrication, paints, primers, and paint thinners. All materials are approved by the HAFB HAZMART prior to being obtained. A new rail-mounted, diesel-powered multi-purpose utility cart uses high-pressure water blast to clean the rails of paint and rust, and to repaint the rails as needed for exceptionally high-speed tests. Depending on the number of exceptionally high-speed rail tests, the rails would be stripped and repainted no more than twice per year.

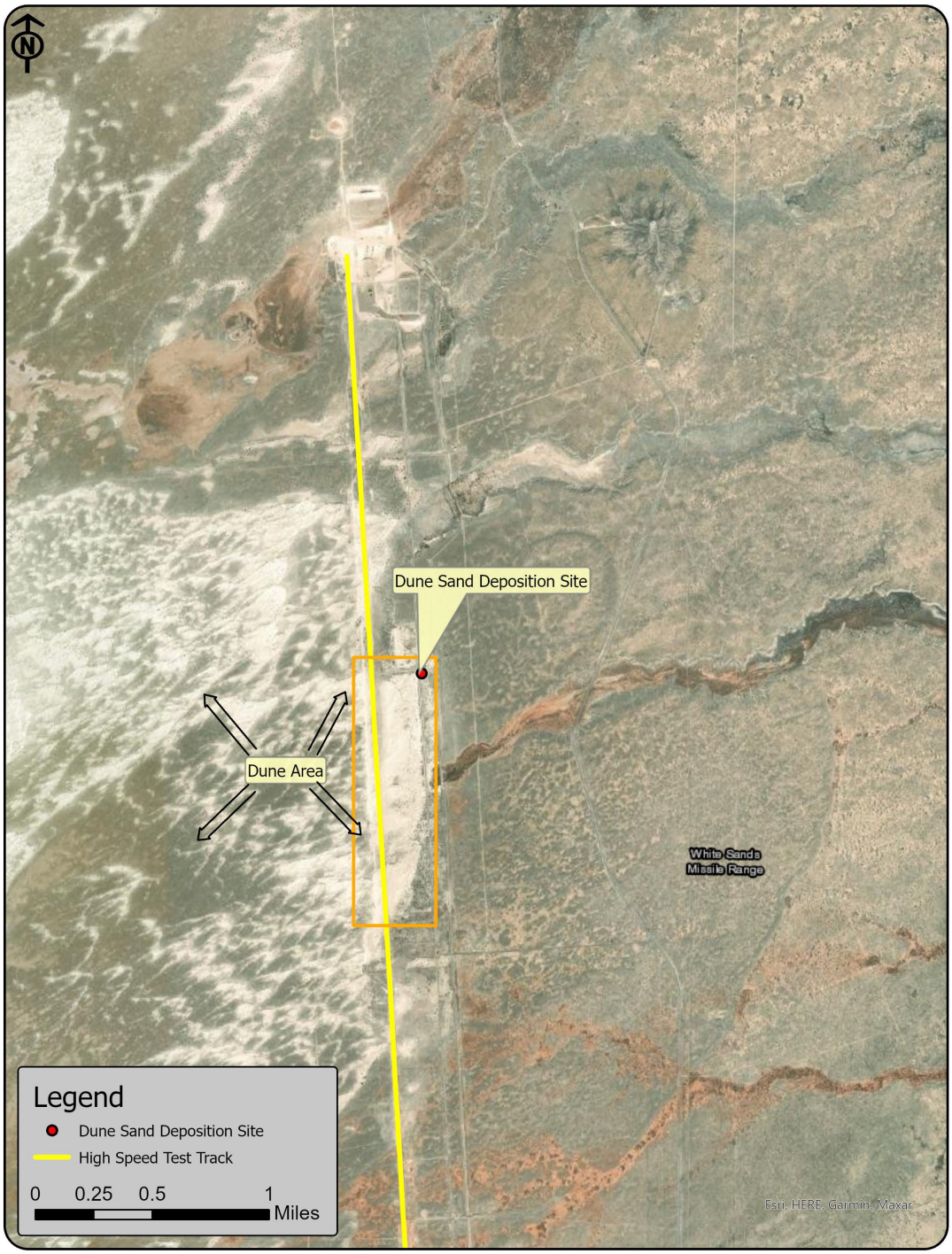

Figure 3. HHSTT Waste Sand Area

2.1.5.4. Storm Water Management

In 2015, the HAFB requested and received an approved jurisdictional determination from the Army Corps of Engineers that determined waters on the base are not jurisdictional/"waters of the U.S" or subject to regulation under Section 404 of the Clean Water Act. HAFB contains isolated intrastate waters without a connection to the nearest Traditional Navigable Water, the Rio Grande. However, HAFB still implements stormwater best management practices recommended by the U.S. Environmental Protection Agency, such

as properly storing and disposing of all hazardous materials and installing berms where needed to prevent storm water runoff from HHSTT operations and maintenance. A levee system and retention basins were installed at Hay Draw to minimize stormwater runoff that could impact the rainfield.

Storm water drainage from precipitation events along the Test Track, with the exception of the south end of the Track (which flows toward the Lost River Playa), flows by sheet flow to the adjacent desert. The isolated wetlands, no longer under the authority of the U.S. Army Corps of Engineers as "waters of the U.S.", are located at least 250 feet from the Track. A storm water basin is located adjacent to the south end of the Track and storm water from this area is permanently routed to the existing storm drain at the south end of the track for flow to the Lost River Playa.

Test Track support industrial buildings include, but are not limited to, buildings 1173, 1176, 1178, 1178A, and 1185. Activities conducted in these buildings include the fabrication and maintenance of sleds and test components (buildings 1173 and 1178), rain simulation (Building 1176), painting (Building 1178A), and metal fabrication, heat treating, and bead blasting (Building 1185).

Two above-ground storage tanks which contain diesel fuel and gasoline, with capacities of 1,000 gallons and 2,100 gallons respectively, are located in a concrete-paved and bermed area east of Building 1180. There are two in-ground oil quench tanks used in the Heat Treatment process located in Building 1185, one holding 1,000 gallons and the other holding 700 gallons. Above-ground storage tanks at Building 1166 contain 1,034 gallons of Motor Gasoline, and 2,037 gallons of diesel fuel. A tank and trailer at the north end hold 250 gallons of diesel fuel.

Bulk outside metal storage is located west of Building 1185. Outside sled storage is located west of Building 1173.

The 49 CES/CEIE installed an automated water quality sampling system at Outfall 08, which is the main runoff diversion for the south end of the Test Track to collect runoff from precipitation events. Only two samples have been collected since installing the sampler (November 2000 and July 2001). Collected samples were analyzed for parameters required by the state of New Mexico for the 1995 Multi-Sector General Permit for Storm Water Discharges from Industrial Activities for Sector P (Motor Freight Transportation Facilities) and Sector S (Air Transportation Facilities). These parameters are Total Suspended Solids, Ammonia Nitrogen, Total Kjeldahl Nitrogen, Nitrate + Nitrate Nitrogen, Chemical Oxygen Demand, and Oil and Grease. This demonstrates that large discharges or runoff events from the Track to the Lost River are currently uncommon because of generally low precipitation levels. However, the 49 CES/CEIE does have concerns about the sensitivity of the sampling system to small runoff events. The sampling system was upgraded in 2002 to attempt to capture samples from smaller runoff events.

The only Multi-Sector General Permit Benchmark exceeded in the two samples collected was for Nitrate + Nitrate Nitrogen. Each sample had 2.0 mg/L and 4.78 Mg/L Nitrate + Nitrate Nitrogen, respectively, well over the benchmark value of 0.68 mg/L. However, this value is well below the Safe Drinking Water Act Maximum Contaminant Level (MCL) of 10 mg/L, therefore meeting Federal standards for safe drinking water. It should be noted that data obtained from the USGS National Atmospheric Deposition Program indicates that ambient Nitrate + Nitrate Nitrogen was approximately 1.2 mg/L during 2000, also well above the benchmark value. Discussions with U.S. EPA storm water program personnel indicate that Nitrate + Nitrate Nitrogen levels below the Safe Drinking Water Act MCL are generally not of concern.

Water from sled test activities remains in the trough and is subsequently drained to either a retention basin or sent out on to the ground to either evaporate or percolated back into the ground. There are three drains along the test track located at TS 51,000, TS 45,640.297 and TS 20,624.315 (see Section 2.1.1, Sled Operations, for more detail). The drains are attached to rectangular concrete ditches located on the west side of the test track which are used to transport the water to the existing retention basin also located on the west side of the test track. Additionally, a dam consisting of sandbags is placed just south of the drain

located at TS 20,624.315 to prevent water within the trough from flowing southward. Any water that does flow southward from minor seepage through sandbags or from precipitation events generally evaporates prior to reaching the south end of the track (3.9 miles from the sandbags drain).

2.1.5.5. Hazardous Waste Management and Solid Waste Management

All debris and material are cleaned up after each test and disposed of according to regulation. The HHSTT, as a tenant activity on HAFB, controls its own initial accumulation points compliant with the RCRA, and uses the Main Base's 90-day accumulation point under HAFB's Part B permit. Solid waste is included in the HAFB solid waste contract, and reusable/recyclable materials are sent to DLADS for reuse/recycling as appropriate.

A 41,600 square foot facility for storing expended NIKE and other rocket motor casings is located adjacent to Building 1177 and is fenced and hardened with recycled asphalt. The DLADS currently arranges for all NIKE rocket motor casings containing asbestos to be disposed of at a RCRA-approved treatment, storage, and disposal facility.

2.1.5.6. Underground Pipelines and Wires, and Cables

Four-inch diameter underground pipelines are installed to transport helium from the ARC Building (Facility #1625) about 1,000 feet to the Track. In the future, alternate gases may be used for low atmospheric density high speed tests.

Permanent communications wire is buried in conduit five feet underground to transmit data to TDC which has been recently replaced. Overhead electrical lines from the La Luz substation located in the Tula Peak area run along the west side of the Track. Temporary communications wire is often run on the ground surface between test instruments and track facilities. All communication wire set aboveground is cleaned up after completion of every test, especially in the impact area at the north end of the Track. This is especially important along Camera Pad Road where the wire could get caught in grounds maintenance mowers.

Approximately three miles of fiber optic cable in conduit have been installed in trenches from the north end of the track south along the edge of Camera Pad Road and along the east Track Road to access the ARC building for communication and test instrumentation in "real time." Fiber optic cables were placed in underground conduits along the east side of Camera Pad Road and run the entire length of the road.

2.1.5.7. Personnel

The HHSTT is under constant maintenance and repair to ensure that tests can be completed successfully. Personnel needed for this maintenance include welders, sand blasters to remove old paint from rails, painters, concrete fabricators, surveyors using laser instrumentation, and heavy equipment operators, such as crane and bulldozer operators. Most activity, except for placing cameras during some tests, is conducted along the Track itself, on the roads and road rights-of-way, and at existing buildings or facilities.

2.1.5.8. Bird/Wildlife Aircraft Strike Hazard (BASH) Management

Occasionally, BASH hazards are caused by small birds and coyotes, especially where Hay Draw crosses the Track. Small species of birds, primarily doves, often roost on the rails during the day. Currently, a small monorail sled (the birdchaser sled) is run on the opposite rail a few seconds prior to the test launch to dislodge birds. Eight to ten portable orchard cannons, fueled by propane are also fired at random intervals shortly before the test to scare birds and other animals away from the track. Some tests require the still air conditions occurring at night. When possible, tests are conducted at night when birds are not in the vicinity of the Test Track. The BASH events are only recorded if tests are affected.

Small herds of oryx, a non-native species of large antelope, also routinely move throughout the area, especially north and east of the Test Track. Prior to test, trucks and personnel on foot chase any oryx out

of the area between the east side of the Track and Camera Pad Road. Occasionally, sirens are used. The oryx are relatively unafraid of people, sometimes making it difficult to move them. The 704 TG asks 49 CES/CEIE to request a population reduction hunt by New Mexico Department of Game and Fish when Test Track personnel become concerned that oryx might begin interfering with tests. These population reduction hunts are generally conducted between November and March. In addition, oryx can be removed by NM Department of Game and Fish personnel at any time of the year.

2.1.5.9. Heliport

Helicopters occasionally use the heliport located in the developed area at the south end of the track to transport distinguished visitors on tour of the Track or administrative or support trades test personnel to check the status of live munitions in the north end impact area after tests.

2.1.6. Best Management Practices

The following best management practices were developed to minimize the degree and/or severity of adverse effects to natural and cultural resources. These practices are incorporated into all HHSTT projects and activities as applicable.

Soils

- When traveling off of established roads for mission-essential activities only (including debris searches), trucks, off-road vehicles, and other vehicles will travel at low speeds (no greater than 10 mph). At low speeds, disturbance of archaeological sites, biological soils crusts and potential soil erosion may be reduced. Vehicles will also use the same track in and out whenever possible.
- When soils are moist, off-road vehicle use will be conducted only for absolutely mission essential operations. Otherwise, off-road vehicle use will be postponed until soils are dry.
- 49 CES/CEIE and Test Track personnel coordinated authorized transportation routes using existing roads in the Test Track area to create the minimal off-road tracks as necessary for meeting Test Track mission. These roads include paved, gravel, and dirt roads. On some dirt roads, it may be desirable to reduce dust and protect vegetation by hardening dirt roads with recycled paving products. The only road planned for surfacing to date accesses two new proposed munitions storage buildings (Buildings 1148 and 1149). In these instances, the 704 TG will request authorization to hard-surface specific roads through 49 CES via the AF Form 332 and AF EIAP process. Any existing dirt roads that may become necessary to surface will also be requested through 49 CES and undergo appropriate analysis.
- Any proposed ground-disturbing activities and off-road vehicle use must be coordinated via AF EIAP and work order processes (AF Forms 103, 332, 813) to identify and avoid impacts to archaeological, historical, and sensitive natural resources.
- Any activities that would result in destruction of microbiotic soil crusts and/or loss of native vegetation should be minimized, specifically the development of new roads across previously undisturbed native vegetation. Revegetation or reseeding of disturbed areas should occur as soon after the disturbance as possible. The most appropriate seeding season is typically late June through mid-July to coincide with the start of the summer monsoon season. However, any seed mixtures will include a mix of cool and warm season plants, so that seeding may be done in the fall and winter as well as the spring and summer, as long as the seeds are incorporated into the soil. Supplemental watering may be required for the reestablishment of native vegetation. The 49 CES/CEIE will provide recommendations on specific seed mixes and other soil stabilization requirements as needed.
- In the Lost River drainage, activities must be conducted at least 100 feet away from the edge of the drainage to maintain compliance with the Interagency Cooperative Agreement for the Protection and Management of White Sands Pupfish.

Air Quality

- 49 CES/CEIE will be consulted prior to any static test program using AF Form 813 to determine if any construction or air quality permit is required prior to conducting specific static tests.
- 49 CES/CEIE will work with Test Track operators to determine if any proposed static tests should be included in the HAFB Clean Air Act operating permit.
- Test Track operators will provide to 49 CES/CEIE information necessary to determine the amount and types of air pollutants emitted from static test operations.

Water Resources

- Construction and military activities within and adjacent to wetlands should be avoided to the extent possible. However, all activities which would impact wetlands must be coordinated with 49 CES/CEIE and appropriate protective management actions developed and implemented. Establish Best Management Practices (BMPs) to avoid construction or military activities within wetlands and floodplains adjacent to the wetlands. Any construction or activities proposed for wetlands or floodplains must be documented on an AF Form 332 with a site plan and an AF Form 813 for environmental evaluation. Air Force policy (AFMAN 32-7003) requires avoiding wetlands and floodplains where practicable, consistent with the Executive Orders.
- Heavy equipment shall not be used in wetlands, including for clearing sand from below the powerlines on the west side of the Track, unless there is no practicable alternative, consistent with all applicable Executive Orders and Air Force policy (AFI 32-7064).
- Test Track and 846 TS personnel will adhere to all water conservation measures adopted by the 49 FW during times of drought conditions. The measure that pertains to all Test Track/Test Group facilities includes restrictive watering schedules for watering landscaping. Only in extreme emergency situations (for example, lack of potable water for human consumption) could track operations requiring potable water be affected. Any water conservation measures will be forwarded to the Environmental Coordinator(s) for the Test Track/Test Group for proper internal distribution and implementation.
- Locate and repair any leaks in the water main running parallel to the Test Track as leaks in the system are suspected and/or identified to eliminate wasted water and to protect the Test Track from being undermined.
- Close the gate valve on the water main feeding the Test Track on down days, weekends, and holidays to minimize water loss and usage when there are no operations that require water. The shutting of the water supply will have minimal impact on the ARC building 1625, Buildings 1160/1161 and the survey shop, due to a Monday to Friday work week schedule.

Vegetation

- In addition to those noxious plant management actions identified in the HAFB Integrated Natural Resources Management Plan and Noxious and Invasive Species Management Plan, the following actions specific to management of the HSTT will be followed:
- The cost of revegetation and restoration, and noxious plant management for ground disturbing activities needs to be estimated for projects in the initial planning stages and incorporated into project funding requests. Funding for both considerations should be multi-year in nature to ensure success for the project and for invasive plant management on HAFB.
- Restoration/revegetation shall be conducted after ground-disturbing activity that results in the removal of existing native or nonnative vegetation. These types of activities are typically installation or repair of cable line or pipeline and construction projects. Without implementation of revegetation practices, nonnative invasive plants, especially African rue, will likely infest newly disturbed areas.

- Blading away from the Test Track will not be allowed, except for Camera Pad Road, powerline clearances, and sand buildup in line-of-sight removal areas. Any blading for sand removal will be no more extensive than required to clear the Track, roads, power lines, and line-of-sight areas and must be preceded by an AF Form 813, and AF 103 or 332 depending upon the scope of the action. Sand will continue to be deposited in the approved dune disposal area east of Camera Pad Road.
- Vegetated areas on the eastern edge of the dune fields should not be disturbed unless approved by 49 CES/CEIE on AF Form 332. Vegetation stabilizes the dunes, minimizing movement.

Wildlife (Including Threatened and Endangered Species)

- 49 CES/CEIE, Test Track personnel, and New Mexico Department of Game and Fish (NMDGF) continue to coordinate to develop threshold levels for requesting oryx population reduction hunts. When these levels or conditions are reached, 49 CES/CEIE and Test Track personnel will coordinate hunts with NMDGF and hunter access will be coordinated with 49 SFS.
- The Test Group representative on the BASH Working Group will work with 49 FW/SEF to modify existing forms to accommodate reporting BASH incidents at the HSTT, and to develop procedures for submitting feather and fur remains for identification. Forms would include information such as date, time, species, problem, or damage caused.
- Use of noisemakers for harassing birds away from the Track prior to tests should follow approved guidelines and Test Track personnel will be trained in the operation of such equipment.
- 49 CES/CEOIE will be called for assistance in capturing live snakes for relocation.
- Snakes may not be otherwise captured, traded, sold or otherwise removed from base. 49 CES/CEOIE is equipped to handle any snake considered a nuisance or threat. Personnel operating in areas where snake encounters regularly occur shall wear protective apparel such as high top boots, snake chaps, or leggings and shall not kill or harm snakes.
- 49 CES/CEOIE and 49 CES/CEIE will ensure an annual joint briefing with appropriate speakers to Test Track personnel who regularly encounter snakes. Briefings will cover such topics as basic snake ecology, snake avoidance and handling techniques, and treatment of snakebite.
- Test Track personnel will call 49 CES/CEOIE to live-trap and relocate any problem animals (foxes, badgers, etc.). Entomology personnel will also coordinate these activities with 49 CES/CEIE. Educational materials and/or briefing will be provided to discourage 846 TS personnel from feeding wild animals.
- Bats may interfere with the mission and constitute a pest management problem at the Test Track. Track personnel will coordinate with 49 CES/CEIE to develop an appropriate management response for bat exclusion and personnel health and safety requirements, as well as historic preservation purposes in older facilities.
- Units requesting bat exclusion devices or control measures must submit an AF Form 332 requesting assistance and consult with 49 CES/CEIE.
- Clean-up procedures as outlined in the INRMP (2018) and/or HAFB Pest Management Plan would be followed if bat guano becomes a concern within the buildings at the track.
- Before demolishing or modifying a structure at the Test Track, a bat survey should be conducted in the early evening or at night both inside and outside the building (some locations have bats living behind circuit breaker boxes). If bats are present, 49 CES/CEOIE and 49 CES/CEIE through AF Forms 813 and 332 will ensure that bats are not present. If bats are present, 49 CES/CEIE will determine species and the best removal technique.

White Sands Pupfish

Under the Cooperative Agreement, HAFB has agreed to and continues to:

- Continue participation on the White Sands Pupfish Conservation Team to review activities that might affect the pupfish or its habitat, make recommendations and provide advice and information to the Team, and meet at least annually to discuss pertinent concerns.
- Provide logistical and financial resources necessary to carry out the responsibilities identified in the Cooperative Agreement, to at least, subject to the availability of funds, provide personnel and equipment to semi-annually monitor habitats and populations of pupfish and exchange manpower, equipment, and funds to carry out other activities under the Agreement.
- Protect, manage, and enhance habitats of White Sands pupfish within Essential Habitat and Limited Use Areas on HAFB, in coordination with signatory agencies.
- Restrict all non-emergency activities, including vehicular traffic, within Essential Habitat with the exception of use of existing improved and unimproved roads, and for management, conservation or research of natural and cultural resources (to include but not be limited to pupfish monitoring, research, and conservation activities). Any such restricted non-emergency activities can only occur after consultation with the responsible WSMR, HAFB, or White Sand National Park official consulted.
- In case of emergency activities that may affect habitats of White Sands pupfish, such as chemical spills, debris recovery from military activities, or carrion removal, notify and confer with NMDGF and USFWS, as appropriate. Implement, review, and update as necessary, incident response programs for accidental chemical spills, impacts from airborne debris, vehicle accidents, etc. and coordinate the resolution of any unforeseen perturbation to the White Sands pupfish or its habitats with signatory agencies immediately upon detection or advisement of such event(s). No man-caused water removal from Camera Pad Pond, into which pupfish from the experimental population have been relocated, will be allowed.

Western Burrowing Owl

- Artificial burrows, set back from the road in the right-of-way, have been created and maintained annually between November and March along DeZonia Road, Vandergrift Road, Taxiway Alpha, along the Test Track and on Camera Pad Road for burrowing owls. Even though burrowing owls are present in substantially lower numbers on HAFB than in 2000, the population has increased since 2000 and the artificial burrows will continue to be maintained.
- 49 CES/CEIE will continue to survey all areas of known burrowing owl burrows linked to mission activities at the airfield and the artificial burrows for activity; every year during the breeding season (mid-March through mid-July); and breeding/fledging success every three years; and for current occupancy wherever burrowing owls are found. Signs marking artificial burrows will be maintained.
- Any permits needed from the U.S. Fish and Wildlife Service or New Mexico Department of Game and Fish to cover “incidental take, relocation, or banding” will be the responsibility of 49 CES/CEIE and/or any designated contractor.
- 49 CES/CEIE will continue to incorporate educational materials regarding burrowing owl management into natural resources brochures, cards, and handouts.
- Research should continue to focus on monitoring western burrowing owl populations and protecting their nesting and wintering burrows from disturbance. Four principal research and monitoring directions discussed in Mehlhop et al. (1998) include:

- Population trend and breeding success
- Predator impact
- Owl diet and foraging efficiency
- Effect of human activity on owl reproductive success
- Owl activity and seasonal patterns

Cultural Resources

- Archaeological sites are both numerous and very sensitive in the Dunelands/Test Track and will be managed in the following ways:
- All vehicular use shall stay on existing roads as designated within the highly disturbed areas within 75 feet of the track, except for mission-essential actions such as debris searches and for placing cameras as necessary.
- Any digging shall have an AF 813 completed and AF Form 103 (digging permit) coordination.
- All researchers conducting activities in the dune area will be briefed not to dislocate, damage, or remove any artifacts, historical, or archaeological (felony violation of Archaeological Resources Protection Act).
- Blading around the Test Track will be conducted as described in Section 2.1.5.2, based on an AF Form 332, to protect vegetation and archeological resources.
- All archaeological sites from which data recovery has occurred will be reviewed to determine if any other significant data have become apparent.
- The distinguishing historical characteristics of Blockhouse ALPHA that contribute to its eligibility for the National Register of Historic Places, including the control room and tunnel, shall be conserved and maintained to retain the integrity of the site for the National Register of Historic Places.
- Debris searches for test objects and detritus in the debris field at the north end of the HSTT and north of the HAFB/WSMR boundary are normally conducted on foot or light all-terrain vehicles which cause minimal surface disturbance and may traverse undeveloped or undisturbed areas. Heavier vehicles should be limited to established two-tracks or roads, or to areas cleared by environmental staff. The exception to this is short, single trip (out and back) travel by one tractor-tired front loader away from the existing roads to carry test objects back to the road. When heavy equipment such as backhoes, graders, trucks one ton and over or similar vehicles, is used to disturb, grade, or excavate any area in search of test objects, 49 CES/CEIE or WSMR IMSWWSM-PW-E-ES shall be consulted prior to the action. The 49 CES/CEIE may be required to be present to record pre-existing conditions, look for and protect sensitive archaeological items and to prepare a brief report on their findings.

Solid Waste

- All temporary storage areas shall be identified, and the perimeter delineated on the ground. All materials shall be stored within the perimeter of such authorized sites. Any materials that may degrade when exposed to the elements shall be stored within appropriate shelter and on elevated pads when appropriate.
- All degrading materials and unsightly litter shall be cleaned up and disposed of appropriately.
- All new communications wire not necessary for a current test shall continue to be cleaned up immediately upon completion of the test. All existing unused communications wire or cable shall be cleaned up and disposed of appropriately.

2.2. Planning Approach and Criteria

The 846 TS reviewed their existing facilities, infrastructure, land use, and constraints development, and compared those to their vision for HHSTT system modernization and goal, and future program requirements, and long-term investment strategies. The following objectives were considered by project planners and developers:

- Provide HHSTT System that supports the 846th TS's current and foreseeable future mission.
- Provide use of the southern 5,000 feet of the track.
- Provide a third rail that extends the full length of the track.
- Provide a design that extends the life of the HHSTT System.

2.3. Alternative 1: No Action Alternative

The HHSTT activities, existing facilities, tests conducted, and general operations and maintenance would continue under the No Action Alternative as described and analyzed in the1998 and 2008 High Speed Test Track Operations PEA documents and described in Section 2.1. Under the No Action Alternative, the rainfield modifications would not occur. The No Action Alternative would be mission adverse and would not meet the requirement for safely continuing the current and future mission of the 846th TS to provide hypersonic recovered sled test capabilities for operationally relevant test articles.

2.4. Alternative 2: Proposed Modifications to the Current Operations of the HHSTT (Proposed Action)

The USAF and 846th TS propose to continue operations of the HHSTT as described under section 2.1, existing high speed test track facilities, with modifications. The operations would be modified with proposed infrastructure on the east side of the track to move the rainfield valve sets and updated best management practices and management actions as standard operating procedures identified in Chapter 4. Under Alternative 2, the 6,000 feet of rainfield over the A rail would remain and infrastructure for two additional rainfield areas would be installed on the east side over the narrow gauge system, with one directly across from the existing rainfield and one due south as needed to support test requirements between TS 15,300 and 27,300 (Figure 4). The proposed infrastructure would consist of installing pipework on the east side of the track on the existing asphalt access roadway adjacent to the track (Figure 5). The remote valves for the rainfields are mounted on skids and moved by forklifts to attach to the pipework (Figure 6) and may be moved and operated at any of the rainfields. Only one of the three available 6,000-foot rainfields would be operated at a time therefore the existing pump and pumphouse would remain as is. The east side of the track where the new valves sets are proposed are within the built upon environment and is within the area impacted by past and current maintenance and operations.

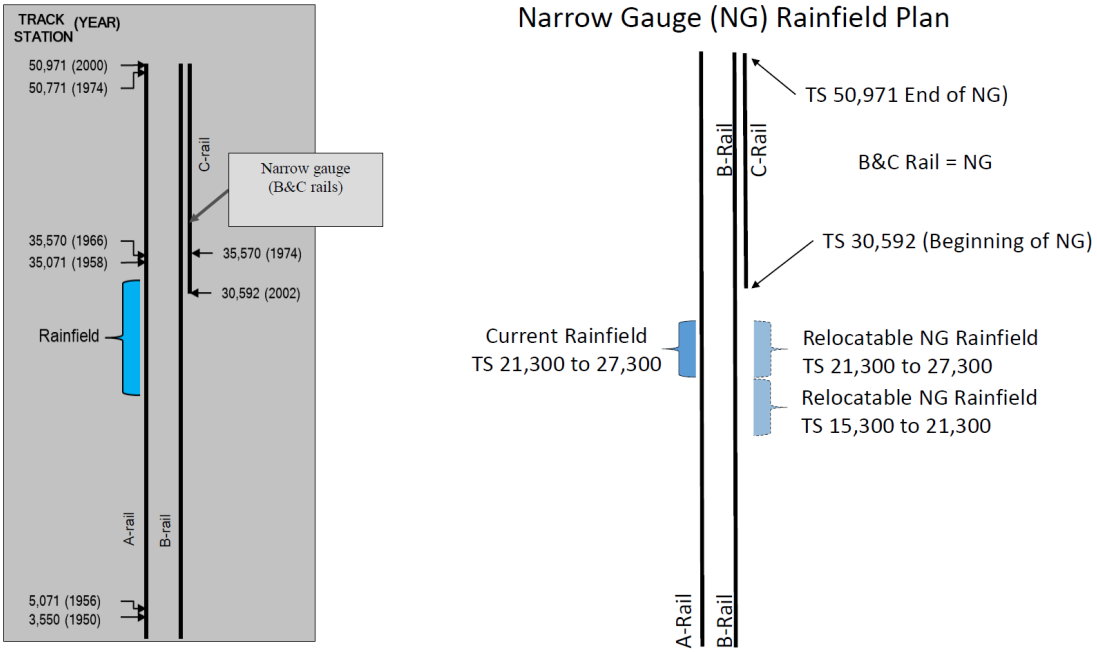

Figure 4. Proposed Rainfield Modifications to HHSTT

Figure 5. Proposed Pipework for Rainfield Modfications on East Side of HHSTT

Figure 6. Remote Valves Used for Rainfield Modifications.

2.5. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The following alternative was eliminated from further consideration based on not meeting the project objectives. The alternative considered but eliminated is discussed in more detail below.

2.5.1. Construct a New Track at a New Location

This alternative would construct a new High Speed Test Track at a new location that allowed concurrent operations. Other than the existing HHSTT Complex, there are no other locations on HAFB other than the dune field west of the existing Track that could provide a site that is unobstructed, uninhabited, highly instrumented free-flight test range for conducting rocket sled tests. The west dune field location would involve massive time and expenses in environmental studies and analysis, geological analysis, complete engineering design, utility extension and construction execution. In addition, moving the track to another location on HAFB would require the base to establish new restricted areas for explosive safety arcs and building support facilities and utilities. Moving the HHSTT facilities and operations to another location and establishing a new area for explosive safety arcs is not feasible. This alternative was rejected from further consideration in this PEA due to: the constraint of needing continuing operations of the current HHSTT; the time required to conduct environmental and engineering analyses of a new track; and the costs that are reasonably projected to require Congressional line item approval in a series of Defense Appropriations Acts. The latter two requirements are well beyond the need of continuing HHSTT operations with minor modifications and maintenance of the existing facility.

3. Affected Environment and Environmental Consequences

This section describes the affected environment and environmental consequences for the HHSTT operations as they relate to the implementation of the Proposed Action and the No Action Alternative as described in Chapter 2. The No Action Alternative reflects the current situation within the HHSTT and will serve as the baseline for comparing the environmental impacts of the analyzed alternatives.

In compliance with NEPA and CEQ guidelines (40 CFR 1501.7[3]), only those resources and conditions having the potential to be affected by the action are discussed and analyzed within this section.

3.1. GEOLOGY AND SOILS

3.1.1. Existing Conditions

Geology

Holloman Air Force Base lies within the Tularosa Valley, a closed desert basin with no outlet for surface water flow. Formed due to Rio Grande rift action to the immediate west, the basin began as a large anticline of Paleozoic sedimentary rock between the present San Andres and Sacramento Mountains. Pull-apart faulting caused the arch to collapse, forming the valley (Chronic 1987). The valley dropped below regional terrain and the Rio Grande ran through the early Tularosa Basin. Gradual uplift and the Organ Mountains orogeny diverted the Rio Grande back to the west and the Tularosa Valley became a basin with higher elevations on all sides.

The Tularosa Basin has filled to its current levels with alluvia from the Organ Mountains on the southwest; San Andreas Mountains on the west; Chupadero Mesa and the New Mexico Highlands on the north; Carrizo, Sierra Blanca, and Sacramento Mountains on the east. A subsurface divide separates the Tularosa Basin from the Hueco Bolson in Texas and Mexico to the south. The basin fill found away from the piedmont consists of very deep, very fine grained and well-sorted soils with high calcium carbonate and sulfate levels, a poor soil for agricultural development.

Soils

Soil data information was gathered from the Web Soil Survey operated by the US Department of Agriculture's Natural Resources Conservation Service (NRCS). An important feature of gypsiferous desert soils in the Tularosa Valley region is cryptogamic crusts. These crusts are a collection of living organisms such as cyanobacteria, algae, micro fungi, and bryophytes that create a biological soil crust (BSC) that lives within or on top of the soil. These BSCs can increase soil stability and convert nitrogen from the atmosphere into bioavailable nitrogen within the soils. The BSCs are fragile and are only metabolically active when wet and as such the amount of precipitation is the limiting factor in the growth and regeneration of these crusts. Due to the arid climate, disturbed BSC takes years to regenerate.

Soils in the study area consist of seven mapping units (Table 2). Most of the soils in the study area are comprised of gypsiferous soils which are the soils that are sandy and well drained to excessively drained. These soils are typically formed in sediment of eolian (e.g., wind-blown deposits) and alluvial origin. The surface layer is typically very fine sandy loam with weak, medium coarse and granular structure. Disturbing vegetative cover on these soils increases wind erosion and blowing dust. The soils in the study area do not provide good road fill material and have limitations for construction of buildings due to lower soil strength and varying dept to bedrock (NRCS 2020).

Table 2. Description and spatial extent of individual soil mapping units identified within the study area.

Soil Mapping Unit	Acres in Study Area	Description
Astrobee-Lark association, 0 to 35% slopes	105.9	Gypsiferous fine sandy loam soils, excessively drained, found on interdunes and basins.
Harses gypsiferous loamy fine sand, 0 to 5% slopes	37.1	Gypsiferous loamy fine sand poorly drained. Found on playa steps and basins.
Lark association, 0 to 60% slopes, duneland	106.4	Gypsiferous eolian sands found on dunes and basins. Soils are excessively drained.
Marconi-Prelo-Fluventic Haplocambids complex, 0 to 8% slopes	10.1	Fine-silty alluvium found on drainageways and piedmonts. Soils are well drained.
Matador-Bomber association, 0 to 5% slopes	13.9	Soils comprised of clayey and gypsiferous alluvium that are well-drained. Found on drainageways and piedmonts.
Nasa-Yesum complex, 0 to 6% slopes	8.7	Found on fan piedmonts, lakebeds (relict), piedmonts, and basins. Soils consist of gypsiferous eolian deposits and are well drained.
Yesum gypsiferous sandy loam, 0 to 9% slopes	426.8	Well drained soils consisting of gypsiferous eolian deposits that are well drained. Soils found on fan piedmonts and piedmonts.

3.1.2. Environmental Consequences

Alternative 1—No Action Alternative

No new impacts to soils would occur under the No Action Alternative because no new ground or soil disturbance would be anticipated. Existing test track operations would remain unchanged and best management practices (section 2.1.6) would remain and be followed. These best practices would include restricting travel off established roads for mission-essential activities only (including debris searches), trucks, off-road vehicles, and other vehicles would travel at low speeds (no greater than 10 mph). At low speeds, disturbance of biological soils crusts and soil erosion may be reduced. Vehicles would also use the same track in and out whenever possible. Restrict off-road vehicle used when soils are moist or wet unless conducted for absolutely mission essential operations. Off-road vehicle use should be postponed until soils are dry. Test track personnel, contractors, researchers, and other users shall minimize foot, vehicle, and heavy equipment travel around the track (including for debris searches on HAFB and north of the track on WSMR land) off existing (established) roads, except when mission essential. To protect vegetation and soils crusts, ground-disturbing activities would be coordinated via an AF Form 813 to identify and avoid impacts to soils and biological crusts. Revegetation or reseeding of disturbed areas should occur as soon after the disturbance as possible. The 49 CES/CEIE would provide recommendations on specific seed mixes and other soil stabilization requirements as needed. Activities in the Lost River drainage would be conducted at least 100 feet away from the edge of the drainage to maintain compliance with the Interagency Cooperative Agreement for the Protection and Management of White Sands Pupfish. Following existing track operations and best management practices would reduce

any potential for significant adverse impacts to soils. Impacts to soils would be the same as current existing conditions.

Alternative 2—Proposed Action

Impacts to soils related to the proposed action would be similar to those described above for the No Action Alternative. The Proposed Action would require no ground disturbance because the rainfield modifications would be installed on the existing track road immediately adjacent to the HHSTT.

3.2. AIR QUALITY

3.2.1. Existing Conditions

Holloman Air Force Base and the surrounding area are currently in compliance with the New Mexico State Implementation Plan (SIP) and its requirements for National Ambient Air Quality Standards (NAAQS, Clean Air Act) for all "Criteria Air Pollutants" (carbon monoxide, lead, nitrogen oxides, PM-10 particulate matter, sulfur oxides, and volatile organic compounds). This places HAFB within an "Attainment Area".

Air emissions at the base occur due to training exercises, aircraft refueling and maintenance, rocket firing activities, jet engine testing, fuel storing and distribution, aerospace ground equipment operations, corrosion control activities, emissions from aircraft and motor vehicle operations, boilers, emergency generators, and grounds maintenance equipment. Air emission sources at the HHSTT include the paint booth (Building 1178) and gasoline storage and dispensing for vehicles. Both the paint booth and gasoline storage and fuel dispensing for vehicles are covered under the base wide air quality permit. The paint booth is equipped with fabric filters to control emissions of particulate matter and a device to warn when the filters need to be replaced. Test reports for the paint booth shows an average paint overspray removal efficiency of 98.66 to 99.1% for the air filters installed. Emissions from gasoline storage tanks is from fuel vapors during tank filling and standing storage loss. The gasoline storage and fuel dispensing tanks are in compliance with National Ambient Air Quality Standards. Holloman AFB implements standard operating procedures in accordance with §§ 63.11085 and 63.11116(a) to ensure that gasoline is handled in a manner that minimizes emissions to the atmosphere.

3.2.2. Environmental Consequences

Alternative 1—No Action Alternative

No new impacts to air quality would occur under the No Action Alternative. Impacts to air quality under the No Action Alternative would not result in any changes to existing air quality as there would be no changes to the existing operation of and use of the Track. Air Quality emissions from the paint booth and gasoline storage and fuel dispensing for vehicles are in compliance with National Ambient Air Quality Standards. The HHSTT would continue to implement standard operating procedures in accordance with §§ 63.11085 and 63.11116(a) to ensure that gasoline is handled in a manner that minimizes emissions to the atmosphere. Additionally, air emissions would continue to be monitored in the paint booth to ensure the air filters are working properly and removing particulate matter.

Alternative 2—Proposed Action

There are no anticipated changes to the types of tests or operational changes that would be carried out under the proposed action, thus there are no new anticipated impacts to air quality from existing test track operations. Impacts would be the same as the No Action Alternative because there would be no new ground disturbance from installing the rainfield pipe system along the east side of the track on the existing track roadway.

3.3. WATER RESOURCES

3.3.1. Existing Conditions

Surface Water

Geographically, Holloman Air Force Base is located near the southern end of the Tularosa Basin, which is characterized by desert plains bounded by the Sacramento Mountains on the east, the San Andres Mountains on the west, and the Oscura Mountains and Chupadera Mesa on the north. No streams or rivers exit the closed Tularosa Basin. Most of the annual 8 inches of precipitation on the Main Base falls from convectional thunderstorms during the summer monsoon season, July through September; winters are usually dry.

The major landforms of the Main Base consist of the gypsum sand dunes on the western boundary of the base, and flat, dry, gently sloping alluvial desert plains over the remainder. The plains are dissected from east to west by at least six major intermittent streams (arroyos) with broad drainage bottoms that typically terminate at the dunefield on the western margin of the base. Lost River continues onto the White Sands National Park. Dillard Draw terminates in a series of playa lakes located north and south of US Highway 70 at the southwestern corner of the base. Small permanent and ephemeral lakes and ponds are scattered across the basin floor and several relict dry Pleistocene lakebeds are located in and around the base. The most prominent of these is a lakebed lying just southwest of the Main Base that has been divided by a dam, forming Lake Holloman, which contains water throughout the year, and Stinky Playa, which intermittently holds water. The water source for the Lake Holloman Wetland Complex is treated sewage effluent from the base's wastewater treatment facility. Enhanced wetlands (up to 170 acres) were developed between Lagoon G and Lake Holloman. The Lake Holloman wetlands complex is maintained for storage of wastewater effluent and supports a biologically diverse bird community, especially shorebirds.

Groundwater

Groundwater recharge occurs largely from rainfall and snowmelt in the Sacramento and San Andres mountains, where intermittent steamflow infiltrates into the coarse, loosely consolidated alluvial fan materials at the base on the mountains. Recharge for the Tularosa Basin is estimated to be approximately 86,390 acre-feet per year (Livingston et al. 2002) with the greatest portion accumulating at the base of the Sacramento Mountains. Groundwater under the Main Base is not potable due to brackish quality of the water.

Floodplains

Several drainages within the Main Base are 100-year floodplain zones. These areas are associated with the presence of the poorly drained Mead soils, which are alluvial floodplain soils. These soils are present within Dillard Draw, Lagoon G, Allen, Malone and Ritas and Allen Draws, and Lost River drainages. The flood-prone areas associated with Allen, Malone and Ritas Draws, and Lost River, are within the more remote, less densely developed sections of the base. Neither of the action alternatives are within a floodplain.

Wetlands

Holloman Air Force Base has a total of approximately 33 acres of wetlands that are classified as geographically isolated wetlands that are completely surrounded by uplands (HAFB 2018). The wetlands, while important elements of the landscape and ecosystem, are not jurisdictional or subject to regulation under Section 404 of the Clean Water Act. The HHSTT area has several unique constructed depressions with some wetland character, and several natural wetlands where large drainages from the east terminate in the basin floor east of Camera Pad Road.

Most of the drainages that enter the base from the east eventually lead to the Test Track. Drainages flowing to or near the Track are Lost River to the south, Hay Draw, Sheep Camp Draw, Guilez Draw,

Reagan Draw, and Allen Draw. The Test Track lies perpendicular to east-west draws. Heavy precipitation event flows in Hay, Sheep, Camp, and Guilez draws historically flowed to and infiltrated in the dune field at and west of the Track. The 1950s construction of the facility limited the extent of occasional flow and infiltration to the east of the Track. Hay Draw and most of Sheep Camp Draw, and the eastern portions of Guilez and Reagan Draws appear to be relict features and do not exhibit indicators of historic surface water flow. The Allen and Reagan Draw channels, that combine and pass the north end of the Track, are most likely relict channels of Tularosa Creek. Tularosa Creek now dissipates into the basin three miles to the north of the Track. These areas provide a source of groundwater recharge during heavy rains and may also represent a flash flood hazard, although the entire Track vicinity is identified by Federal Emergency Management Agency as an "Area of Minimal Flood Hazard" (Firmette 35035C0900D, 12/17/2010).

3.3.2. Environmental Consequences

Alternative 1—No Action Alternative

No new impacts to surface or groundwater would occur under the No Action Alternative. Existing test track operations would remain unchanged and best management practices (section 2.1.6) would remain and be followed. Water from the test track would continue to be diverted from the trough to the three drains, which are attached to rectangular concrete ditches located on the west side of the test track that diverts the water to the existing retention basin. The dam consisting of sandbags placed just south of the drain located at TS 20,624.315 would continue to prevent water within the trough from flowing southward. Any water that flows southward would evaporate prior to reaching the south end of the track which is approximately 3.91 miles away.

Alternative 2—Proposed Action

No new impacts to surface or groundwater would occur under the Proposed Action Alternative because no new ground or soil disturbance would occur with installation of the proposed pipe system on the existing track road immediately adjacent to the HHSTT. Existing test track operations would remain unchanged and best management practices (section 2.1.6) would remain and be followed. Water from the rainfields that does not evaporate or splash out of the rails would continue to be drained to the existing curb and gutter system located on the Track roadways. The curb and gutter system would continue to direct stormwater runoff to existing concrete ditches located on both sides of the Track and then to catchment areas or retention ponds.

3.4. BIOLOGICAL RESOURCES

The lakes, lagoons, playas and wetland habitats of the main base support a greater biodiversity than that of the surrounding areas. The largely undeveloped, generally pristine, and comparatively unique areas under the jurisdiction of the National Park Service (White Sands National Park), the U.S. Army (White Sands Missile Range and Fort Bliss Military Reservation), the USDA Forest Service (Lincoln National Forest), and the Bureau of Land Management, combined with the largely open and undeveloped Air Force Base, provide a large expanse of intermixed habitats that include rare and undisturbed vegetative communities and associated rare wildlife and plant species.

Human use has been restricted over much of the Basin since World War II, creating a large area that is in better ecological condition than most of the remainder of New Mexico. However, use is increasing in both quantity and extent, indicating a need for more protection.

3.4.1. Vegetation

3.4.1.1. Existing Conditions

Vegetation on the Main Base is predominantly Chihuahuan Desert Scrub with small areas of grassland and riparian habitats. The basin floor uplands and gently undulating dunes, areas between drainages, are

generally covered by low, sparse bunchgrass-shrub communities. Moving east from the dunes, the vegetative communities are comprised of more shrubs and fewer grasses. Plant communities in and around springs, lakes, small ponds, and wet portions of arroyos are sparse and salt-tolerant.

The HHSTT area is located within the Chihuahuan Basins and Playas and Gypsiferous Dunes ecoregions. Vegetation typical for lower elevations of the Chuhuahuan Basins ecoregion includes desert shrubs and grasses and may consist of creosotebush (*Larrea tirdentata*), tarbush (*Flourensia cernua*), and/or fourwing saltbush (*Atriplex canescens*), as well as acacias (*Acacia* spp.) and mesquite brush (*Prosopis* sp.). Grasses such as alkali sacaton (*Sporobolus airoides*) and black grama (*Bouteloua eriopoda*) or blue grama (*B. eriopoda*) and gyp dropseed (*Sporobolus nealleyi*) are also likely. Areas with relatively shallow gypsic horizons would include gyp grama (*Bouteloua breviseta*) and gyp dropseed (*Sporobolus nealleyi*). Depending on land-use history, tobosa (*Pleuraphis mutica*), burrograss (*Scleropogon brevifolius*), or saltbush (*Atriplex canescens*) may also dominate the area.

In the Gypsiferous Dunes ecoregion consists mainly of gypsum sand dunes and are typically barren. Interdune flats may be vegetated with soaptree yucca (*Yucca elata*), sand verbena (*Abronia latifolia*), mormon tea (*Ephedra nevadensis*), skunkbush sumac (*Rhus trilobata*), fourwing saltbush, gyp moodpod (*Selinocarpus maloneanus*), gyp grama, alkali sacaton, sandhill muhly (*Muhlenbergia pungens Thurb.*), and hoary rosemary mint (*Poliomintha incana*).

Four species of introduced noxious plants have been exceptionally problematic in the Tularosa Basin and on Main Base: African rue (*Peganum harmala*), Russian thistle (*Salsola tragus*), Russian knapweed (*Acroptilon repens*), and saltcedar (*Tamarisk* spp.). Current estimates indicate over 2,800 acres of HAFB, including approximately 700 acres of disturbed roadsides, are overrun by noxious plants.

High densities of African rue have been found along all road rights-of-way across the main base, including at the test track. African rue is beginning to spread into undisturbed areas. It displaces native vegetation due to its aggressive root system but does provide nesting habitat for many native bird species. Saltcedar grows in dense bands along riparian areas and draws, including in Hay Draw. Its deep aggressive root system and high transpiration rate allows saltcedar to out-compete native riparian plants and often contributes to localized water table drops. In marginal ephemeral streams, it may actually dry up the stream. Saltcedar can also increase soil salinity due to high water use.

3.4.1.2. Environmental Consequences

Alternative 1—No Action Alternative

No new impacts to vegetation would occur under the No Action Alternative. Test Track operations would not change from current operations and thus existing impacts to vegetation would remain the same under this Alternative. Current Test Track operations include actions that have and would continue to result in soil and/or vegetation disturbance, but best management practices would be followed (see Section 2.1.6) to minimize impacts to vegetation. Under this Alternative, all landscaping in the Test Track area should follow landscaping guidelines in the approved INRMP (2018) and would avoid using non-native plants and non-drought-resistant plants. Noxious plant management actions identified in the HAFB INRMP and Noxious and Invasive Species Management Plan would be followed. Additionally, restoration/revegetation would be conducted after ground-disturbing activity that results in the removal of existing native or nonnative vegetation. These types of activities typically include installation or repair of cable line or pipeline and construction projects. Without implementation of revegetation practices, non-native invasive plants, especially African rue, could infest newly disturbed areas. HAFB-generated compost mixtures with intermix seeding appropriate for the area as identified by 49 CES/CEIE, would be partially disked into the ground, then watered using a watering truck would be used.

Alternative 2—Proposed Action

Impacts to vegetation under the Proposed Action would be the same as those described for the No Action Alternative because no new ground disturbance would occur with installation of the proposed rainfield modifications.

3.4.2. Wildlife

3.4.2.1. Existing Conditions

The Test Track area on HAFB supports important habitat for various rare and sensitive animals, as well as more common mammals. Common mammals found in the Chihuahuan Basins and Playas and Gypsiferous Dunes ecoregions would include pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), American badger (*Taxidea taxus*), kangaroo rat (*Dipodomys* spp.), woodrat (*Neotoma* spp.), desert pocket gopher (*Geomys arenarius*), kit fox (*Vulpes macrotis neomexicanus*), mountain lion (*Puma concolor*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*). Oryx (*Oryx gazella*), an exotic big game species native to the South Africa were introduced to the Tularosa Basin in 1969. Oryx are a common species within the project area. Brasilian free-tail bats (*Tadarida brasiliensis*), pallid bat (*Antrozous pallidus*), hoary bat (*Lasiurus cinereus*), spotted bat (*Euderma maculatum*), and Pale Townsend's big-eared bats (*Corynorhinus townsendii*) are known to occur on HAFB and at times these bats have been known to inhabit buildings near the Track.

At least 264 species of birds have been identified at Holloman Air Force Base (HAFB 2018). Common birds include the black-throated sparrow (*Amphispiza bilineata*), greater roadrunner (*Geococcyx californianus*), curve-billed thrasher (*Toxostoma curvirostre*), Chihuahuan raven (*Corvus cryptoleucus*), scaled quail (*Callipepla squamata*), Gambel's quail (*Callipepla gambelii*), western burrowing owl (*Athene cunicularia hypugaea*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), and ferruginous hawk (*Buteo regalis*) (Brown 1994, Bailey 1995).

Reptiles include desert box turtle (*Terrapene ornate luteola*), long-nosed leopard lizard (*Gambelia wislizenii*), southwestern fence lizard (*Sceleporus cowlesi*), Texas horned lizard (*Phrynosoma cornutum*), desert spiny lizard (*Sceloporus magister*), Sonoran gopher snake (*Pituophis catenifer affinis*), prairie rattlesnake (*Crotalus viridis*), and massasauga (*Sistrurus catenatus*).

3.4.2.2. Environmental Consequences

Alternative 1—No Action Alternative

Under the No Action Alternative, there would be no changes to wildlife resources within the test track area and thus no anticipated impacts to wildlife species.

Alternative 2—Proposed Action

There would be no changes to wildlife resources within the test track area and thus no anticipated impacts to wildlife species under the Proposed Action Alternative.

3.4.3. Threatened, Endangered, and Sensitive Species

3.4.3.1. Existing Conditions

Under the Endangered Species Act of 1973 (ESA), any federally funded project has the responsibility to address impacts to federally listed, candidate, and proposed species. A list of threatened and endangered species for the proposed action was acquired from the USFWS Information for Planning and Consultation tool (IPaC 2021; Appendix A). The USFWS identified 12 species that could occur within the project area. Additionally, three migratory bird species of conservation concern (protected under the Migratory Bird Treaty Act, MBTA) were identified by the IPaC tool with the potential to occur within the project area.

The species identified using the IPaC tool are listed in Table 3. A list of state threatened and endangered species was obtained from the NMDGF Environmental Review Tool (Table 3; Appendix A). Twenty of the twenty-one species identified in Table 3 are unlikely to be impacted by the proposed action and will not be carried forward for analysis in this PEA. The White Sands Pupfish will be carried forward for further analysis and impacts to this species will be evaluated in this PEA.

Table 3. Federally and State of New Mexico listed threatened, endangered, and candidate species and their likelihood of occurring in the project area.

Common Name/ Scientific Name	Status	Habitat	Likely to Occur	Species Impacted by Action?
Mammals				
New Mexico Meadow Jumping Mouse *Zapus hudsonius luteus*	Endangered	Riparian obligate found in tall, herbaceous vegetation adjacent to flowing streams, irrigation ditches, beaver ponds, and slough habitats.	Unlikely	No
Penasco Least Chipmunk *Tamias minimus atristriatus*	Candidate	Often occupy non-forested habitats composed of shrubs, rocks, dense herbaceous vegetation, or forests with trees that lack low-hanging limbs. In the Sacramento Mountains they are typically found in the ponderosa pine forest zone.	Unlikely	No
Spotted Bat *Euderma maculatum*	State NM - Threatened	Prefers to forage in arid or ponderosa pine forests and marshlands. Large open habitat is likely preferred due to the frequency of their echolocation calls. Roost in small cracks found in cliffs and stony outcrops. Usually associated with habitat with a water source such as a spring, creek, river, or lake.	Possible	No
Birds				
Mexican Spotted Owl *Strix occidentalis lucida*	Threatened	Typically roost and nest in late seral forests or rocky canyon habitats. Most typically found in forests with mature or old growth stands with complex structure with high canopy cover.	Unlikely	No
Northern Aplomado Falcon *Falco femoralis septentrionalis*	Experimental Population, Non-Essential State NM - Endangered	Occupy desert grasslands and savannas. In New Mexico, when found, are often in desert grasslands with scattered mesquite and yucca. Reintroduction program has included areas of White Sands Missile Range.	Unlikely/ Rare	No
Peregrine Falcon *Falco peregrinus*	State NM – Threatened	Prefers open habitats, such as grasslands, tundra, and meadows. Nest on cliff faces and crevices or in urban areas on tall buildings.	Possible	No
Common Black-Hawk	State NM -	Inhabit lowland areas with a source	Likely	No

Common Name/ Scientific Name	Status	Habitat	Likely to Occur	Species Impacted by Action?
Buteogallus anthracinus	Threatened	of water nearby where crabs, crayfish, or other aquatic foods are found.		
Yellow-billed Cuckoo *Coccyzus americanus*	Threatened	Found in open woodlands with a dense shrub layer. Often found in riparian woodlands near streams, rivers, or lakes.	Unlikely	No
Bell's Vireo *Vireo bellii*	State NM - Threatened	Breeds in riparian habitats with diverse vegetation and in dense early successional habitats. May also breed in areas with shrubs, trees, and brushy fields.	Possible	No
Gray Vireo *Vireo vicinior*	State NM – Threatened	Breeds in juniper woodlands and open brush of the Great Basin region.	Likely	No
Fish				
Rio Grande Cutthroat Trout *Oncorhynchus clarkii virginalis*	Candidate	Prefer cold mountain streams and rivers with a moderate gradient and require low summer water temperatures and clean gravel for spawning beds.	Unlikely	No
White Sands Pupfish *Cyprinodon tularosa*	State NM – Threatened	Unique to Tularosa Basin, only 4 populations known. Found in very different habitats ranging from deep spring-fed ponds to calm streams. Tolerates various water salinity levels.	Unlikely	No
Insects				
Monarch Butterfly *Danaus plexippus*	Candidate	Migratory species that summers in the state of NM. Adults feed on flower nectar and larvae feed exclusively on milkweed leaves. Monarchs require abundant source of flowering plants; breeding only where milkweeds are found.	Unlikely	No
Plants				
Kuenzler Hedgehog Cactus *Echinocereus fendleri* var. *kuenzleri*	Threatened	Primarily on gentle, gravelly to rocky slopes and benches on limestone or limy sandstone, in Great Plains grassland, oak woodland, or pinyon-juniper woodland.	Unlikely	No
Sacramento Mountain Thistle *Cirsium vinaceum*	Threatened	Primarily found in high elevation habitat (7,500–9,500 feet) characterized by wet soils derived from travertine or limestone.	Unlikely	No
Sacramento Prickly Poppy	Endangered	Found on western slopes of Sacramento mountains preferring	Unlikely	No

Common Name/ Scientific Name	Status	Habitat	Likely to Occur	Species Impacted by Action?
Argemone pleiacantha ssp. *Pinnatisecta*		dry woodlands and slopes of the foothills of the mountain. Found in limestone canyons, fields, slopes, floodplain and channel deposits, and on roadsides. It prefers relatively moist locations most often north-facing slopes.		
Todsen's Pennyroyal *Hedeoma todsenii*	Endangered	Found in loose gypseous-limestone soils associated with or positioned immediately below the Permian Yeso Formation, usually on steep north or east-facing slopes in pinyon-juniper woodland (6,200-7,400 feet elevation).	Unlikely	No
Wright's Marsh Thistle *Cirsium wrightii*	Proposed Threatened	Prefers wet, alkaline soils in spring seeps and marshy edges of streams and ponds.	Unlikely	No
Migratory Bird Treaty Act Protections				
Black Throated Sparrow *Amphispiza bilineata*	MBTA	Use semi-open areas with evenly spaced shrubs and trees. Common in canyons, desert washes, and desert scrub with creosote, ocotillo, cholla, acacia, sagebrush, mesquite, and rabbitbrush.	Unlikely	No
Chestnut-collared Longspur *Calcarius ornatus*	MBTA	Breeds in shortgrass and mixed grass prairies of the northern Great Plains.	No	No
Long-billed Curlew *Numenius americanus*	MBTA	Breeds in sparse, short grasses, including shortgrass and mixed-grass prairies and agricultural fields.	No	No

White Sands Pupfish

White Sands pupfish (*Cyprinodon tularosa*) is a species unique to the region and only found in a few bodies of water including Lost Lake which is approximately 200 meters south of the study area. This species is listed as threatened in the State of New Mexico and recognized as a species of greatest conservation need (SGCN). While pupfish are plentiful where they occur, they are considered at risk because of their limited distribution. A Cooperative Agreement for Protection and Maintenance of the fish was initiated in 1994 by HAFB, White Sands Missile Range, White Sands National Monument (now National Park), U.S. Fish and Wildlife, and New Mexico Department of Game and Fish. The Cooperative Agreement was renewed in 2020 and HAFB has developed a White Sands Pupfish Conservation Plan as of 2015 to help guide conservation of this species on the base and missile range (HAFB 2018).

Pupfish populations on HAFB have been found in the stream channels of Malone Draw and in Lost River. Areas of concern for the pupfish consist of all watersheds within the topographic drainage of Malone Draw-Lost River and activities within these areas are considered for their cumulative impacts on the pupfish habitats (HAFB 2018). Management of the species is directed by the White Sands Pupfish Conservation Plan which identifies actions and monitoring protocols to be implemented on HAFB to

improve the security of the species (HAFB 2018). The Test Track project area is adjacent to essential pupfish habitat (Lost River) but any actions occurring in the area are not expected to place the pupfish habitat or existing populations in jeopardy.

3.4.3.2. Environmental Consequences

Alternative 1—No Action Alternative

Under the No Action Alternative Test Track operations and activities would remain the same as they are described in Chapter 2. Impacts to sensitive species related to ongoing and existing use of the Test Track could result in possible adverse impacts to White Sands pupfish. Possible adverse impacts to the fish could include emergency actions within the Essential Habitat including the Lost River drainage (Figure 7) such as chemical spills, debris recovery from military activities, or carrion removal. The impact from these actions could be adverse to pupfish populations and/or habitat stability. It is likely that the impacts from an emergency situation would be short lived only lasting the duration of the response to the emergency. Storm water runoff from the HHSTT industrial area could enter Essential Habitat for the White Sands pupfish in the Lost River drainage and may possibly contribute to soil erosion and sedimentation within the Essential Habitat. While sedimentation has not been linked to reduced habitat quality of the pupfish, care would be taken to minimize sedimentation in the Essential Habitat areas for pupfish. To minimize impacts to pupfish due to ongoing Test Track use and operation activities, best practices such as preventing physical removal of water from Camera Pad Pond, into which pupfish from an experimental population have been relocated, would not be allowed. HAFB continues to implement best management practices and follows state water quality policies to minimize the introduction of contaminants into surface and groundwater systems. These actions also minimize the potential for any adverse impacts to White Sands pupfish in the Lost River drainage including near the Test Track. Insufficient information is available regarding potential contamination of pupfish habitat in the Lost River drainage by perchlorate; however, sampling conducted in 2000–2001 would indicate that HAFB has low frequency of occurrence as well as the lowest mean concentration of perchlorate (HAFB 2008). Water discharge from tests may contain chemical pollutants; however, storm water sampling was conducted in 2000–2001 and no harmful levels of chemical or biological pollutants were found at the Lost River drainage near the test track (HAFB 2008). No other water contamination problems are known and HAFB continues to cooperate with the White Sands Pupfish Interagency Team for managing and protecting the pupfish. Because HAFB has and would continue to cooperate with the White Sands Pupfish Interagency Team for managing and protecting the White Sands pupfish, no adverse impacts would be anticipated to the species or the ecosystem function supporting the existing populations of fish.

Alternative 2—Proposed Action

Impacts to the pupfish resulting from the Proposed Action would be the same as described above for the No Action Alternative.

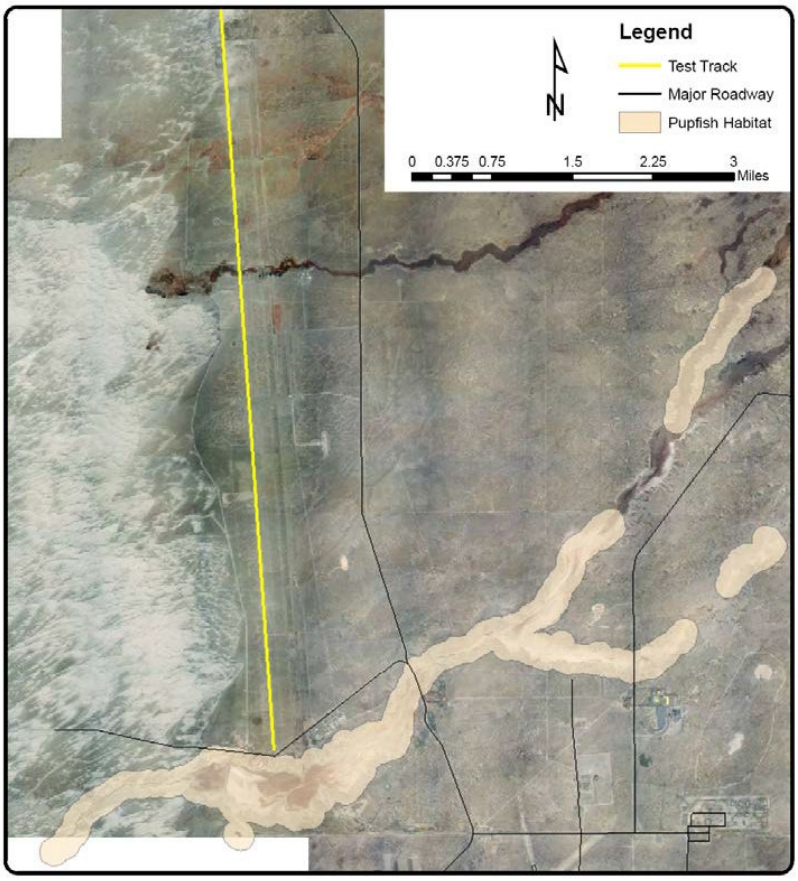

Figure 7. HAFB White Sands Pupfish Essential Habitat located in Lost River, Malone Draw, and Ritas Draw.

3.5. CULTURAL RESOURCES

3.5.1. Existing Conditions

HAFB has sites representing all cultural periods in the Tularosa Basin. Resources representing the Paleo-Indian (some as old as 8000 B.C.), the Archaic, Jornada Mogollon, Apache, historic Hispanic/Anglo, and military cultures are present. The dimensions of known prehistoric sites are generally small but representative of the larger subsistence societies that inhabited the basin during prehistory. Inventory surveys for cultural resources have been completed on all base-administered lands. Of the 363 sites recorded, over 150 prehistoric and historic sites are potentially eligible for listing on the National Register of Historic Places.

Most prehistoric sites are located near drainages in the northern part of the base, especially along Carter and Malone Draws where water is likely to have been present in prehistoric times.The eastern fringe of the sand dunes west of the Test Track (where the chemical characteristics of the gypsum preserve hearth sites) has hearth site complexes in the dunes area which are unique natural plaster casts containing complete hearth contents. These range in size from one to three meters in diameter and range in age from 4,000 to approximately 600 years ago. In the basin area away from the dunefield, artifact scatters are ubiquitous, representing food processing and camp sites, and other residential and economic activities from all cultural periods.

Although little is known about early historic-period activities on HAFB, historic ranching probably commenced following the settlement of nearby Tularosa in 1862. By the late 1940s, two ranches along Malone Draw and numerous wells and stock tanks are indicated on topographic maps, including

Edgington Well just east of the Holloman boundary, and the McNatt and Danley Ranches, currently within the base boundary. Ranching in and near the Main Base involved relatively small subsistence ranching operations with a few range cattle, some personal-use livestock, and lasted from 20 to 30 years. These ranches were discontinued in the 1940s when the land was acquired for military purposes. HAFB has conducted historic research and interviews with those families and published several reports on those ranches.

Since its beginning in 1941 as the Alamogordo Army Airfield and the Alamogordo Bombing and Gunnery Range, HAFB has experienced tremendous growth on the Main Base. The buildings vary from structures built during World War II to buildings currently under construction. The buildings constructed in WWII were typically wood-framed pitched-roof structures with paned windows. During the Korean War, 1950s and 60s (the Cold War period), many of the buildings were constructed of cinder block, especially housing, dorms, dining facilities and some office buildings. Buildings older than 50 years old can be evaluated for National Register eligibility; newer buildings may be considered only if they exhibit exceptional historic value.

3.5.2. Environmental Consequences

Alternative 1—No Action Alternative

The operations and maintenance of the Test Track would continue as is and the existing conditions discussed in section 3.5.1 would remain unchanged. Best management practices in section 2.1.6 would continue to be implemented to protect known and unidentified cultural resources, such as requiring Test Track activities to stay on roads or within areas already heavily disturbed to minimize soil erosion and damage from vehicles. Blading of sand dunes as described in section 2.1.5.2 is only conducted in areas where archaeological survey and excavations have taken place. Further dune removal is reasonably expected to not adversely affect cultural sites; however, ground survey visits are conducted prior to dune reduction to confirm the presence or absence of sites of concern. Any changes proposed to the historic Blockhouses that are considered potentially eligible for listing on the National Register of Historic Places would be coordinated with the 49 CES/CEIE Cultural Resources Manager to avoid degrading historical characteristics.

The HHSTT is located in an area of active dune movement, thus, test track activities could uncover new cultural resources. Should new archaeological resources be identified during Test Track activities, all work would cease within 100 feet or 30 meters of the discovery and the 49 CES/CEIE Cultural Resource Manager would be contacted immediately. Resources would be evaluated for their National Register significance and an appropriate mitigation strategy would be developed in consultation with the 49 CES/CEIE and the New Mexico SHPO.

Alternative 2—Proposed Action

Impacts from the Proposed Action would be the same as the No Action Alternative because there would be no new ground disturbance other than dune reduction, and operations and maintenance of the Test Track would continue as described under Section 2.1. Therefore, the existing conditions discussed in section 3.5.1 would remain unchanged.

3.6. SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.6.1. Existing Conditions

3.6.1.1. Socioeconomics

The region of influence includes Otero County New Mexico and the City of Alamogordo. Potential socioeconomic consequences from the HHSTT activities would be concentrated within the within the county and more specifically the communities of Alamogordo, La Luz, and Tularosa.

Population

The population in Otero County has grown approximately seven (7) percent in the last 19 years (Table 4). Much of the population growth has occurred in the last nine (9) years. The population of Alamogordo has fluctuated over the last 19 years. From 2000 to 2010 the city lost more than 14 percent of the population.

Table 4. Population and Population Trends for 2000 to 2019.

	2000	2010	2019 (estimated)	Annual rate of Change 2000–2010	Annual Rate of Change 2010–2020
Otero County	62,298	63,832	67,490	2.46%	5.73%
Alamogordo City	35,582	30,403	31,980	-14.56%	5.19%
New Mexico	1,819,046	2,059,199	2,096,829	13.20%	1.79%

Source: U.S. Census Bureau 2000, 2010, 2020

Employment

Otero County encompasses nearly 4.3 million acres, of which 68 percent of the land is owned by the U.S. government and 10 percent is owned by the State of New Mexico. Land ownership in Otero County influences the economy of the county. In 2017, about 61 percent of all workers in the county were employed in the Private sector, while nearly 37 percent were employed in Government and government enterprises (NMSU 2019). Within the private sector, retail trade, health care and social assistance were the greatest sources of employment in the county. In the public sector, military and local government were the largest employers in the county. Active-duty military employment accounted for nearly 15 percent, and local government approximately 13 percent of total employment. Federal civilian jobs comprised 6 percent of the work force, and State government employed nearly 3 percent (NMSU 2019). Holloman Air Force Base provides a large employment base for the county and the majority of jobs within the public sector of the economy. Total employment in 2019 in Otero County was 11,947 with a total of 952 employer establishments. The median household income (2015–2019) in Otero County was $41,988.

The most common industries in the city of Alamogordo, NM, by number of employees are Health Care and Social Assistance and Public Administration (Data USA 2021). The economy of Alamogordo employs 13,000 people with Public Administration employing more than 1,800 people (Data USA 2021) which likely captures the civilian employment at Holloman AFB. The median household income in Alamogordo is $44,133.

Economic Activity

The economic impact of Holloman AFB was estimated to be $412 million in 2016 (HAFB 2016) to the community within Alamogordo as well as Otero County as a whole. The HAFB spent $121.1 million on contracts and services with local firms for construction and other services (Table 5).

Table 5. HAFB Economic Activity for 2016.

Economic Activity	HAFB Direct Spending (millions)
Military and Civilian Salaries	$213.4
Job Creation	$77.2
Construction	$78.8
Educational Services	$1.9
Other Local Services	$27.1
Other Local Contracts	$13.3
Total Spending	**$411.7**

The HAFB employed 3,720 military personnel and 1,651 civilians in 2016. In 2016 the Air Force Base created a total of 1,789 jobs with an annual salary of $43,170, which in 2019 dollars, would be equivalent to $45,985 (assuming cumulative price increase of 6.52%) which is $3,997 more than the median household income in 2019 for the county and $1,852 more than the median household income (2019) of Alamogordo. Holloman AFB published in 2016 that they supported through military personnel, civilian employees, and dependents a total of 10,197 people which was approximately 15.5% of the 2016 population of Otero County.

3.6.1.2. Environmental Justice

Under EO 12898, federal agencies must assess environmental justice for a proposed action as part of its mission. Air Force guidance for implementation of the EO is provided in the "Interim Guide for Environmental Justice Analysis" within the EIAP (USAF 1997). The objective of the EO is to identify and address the potential for disproportionately high and adverse health or environmental effects on minority and low-income communities due to the proposed action.

A 15-mile buffer around the proposed action area (digitized, approximate centroid) was assessed using the EPA online Environmental Justice Screen and Mapping Tool, Version 2020 (EJSCREEN, EPA 2020; Figure 8). The EJSCREEN Report for the area assessed is included in Appendix B.

The general population density of the area is relatively low (Figure 9). The majority of the population within 15-mile assessment area are 40 percent minority (EPA 2020; Figure 10). The percent of the surrounding population that is considered to be of low-income ranges from less than 50 percent to the 90–95th percentile (EPA 2020; Figure 11). However, the overall low-income population is 55 percent which is nine percent more than the state of New Mexico average (EPA 2020).

Additional environmental justice indices assessed include:

- Environmental hazards such as particulate matter (PM 2.5) levels,
- Ozone level in the air,
- Diesel PM in air (national-scale Air Toxics Assessment [NATA]),
- Air toxics cancer risk (NATA cancer risk),
- Air toxics respiratory hazard index (NATA respiratory HI),
- Traffic proximity,
- Lead paint indicator (percent of pre-1960 housing),
- Proximity to a superfund site,
- Proximity to a risk management plan (RMP) facility,
- Proximity to a hazardous waste, and
- Wastewater discharge indicator.

Comparrisons of the state, regional, and national percentiles for these indexes within the 15-mile buffer area around the study area are in Figure 11. This information is also included in the EJSCREEN Report provided in Appendix B. The State of New Mexico's percentages for all indices is lower than the EPA Region 6 or national percentages with exception to the waterwater discharge.

3.6.2. Environmental Consequences

Alternative 1—No Action Alternative

The No Action Alternative would not disproportionately impact low-income or minority individuals or populations. The lack of rainfield modifications would not benefit the local economy and the existing conditions discussed in section 3.6.1 would remain unchanged. Therefore, the socioeconomics of the region of influence would remain unchanged and would not be impacted under the No Action Alternative.

Alternative 2—Proposed Action

The proposed rainfield modifications could result in temporary beneficial impacts on local socioeconomics by using regional and local contractors to provide goods and services for construction of the rainfield pipe system. The proposed rainfield modifications would not change the existing community structure or lands for other uses because the proposed pipe system would be installed on the existing Track roadway adjacent to the existing HHSTT. Installation of the rainfield pipe system and continued operation and maintenance of the Track could have a short-term, minor, beneficial impact on the local economy. Therefore, the proposed rainfield modifications and continued Track maintenance and operations would not result in disproportionate negative impacts to low-income or minority individuals or populations.

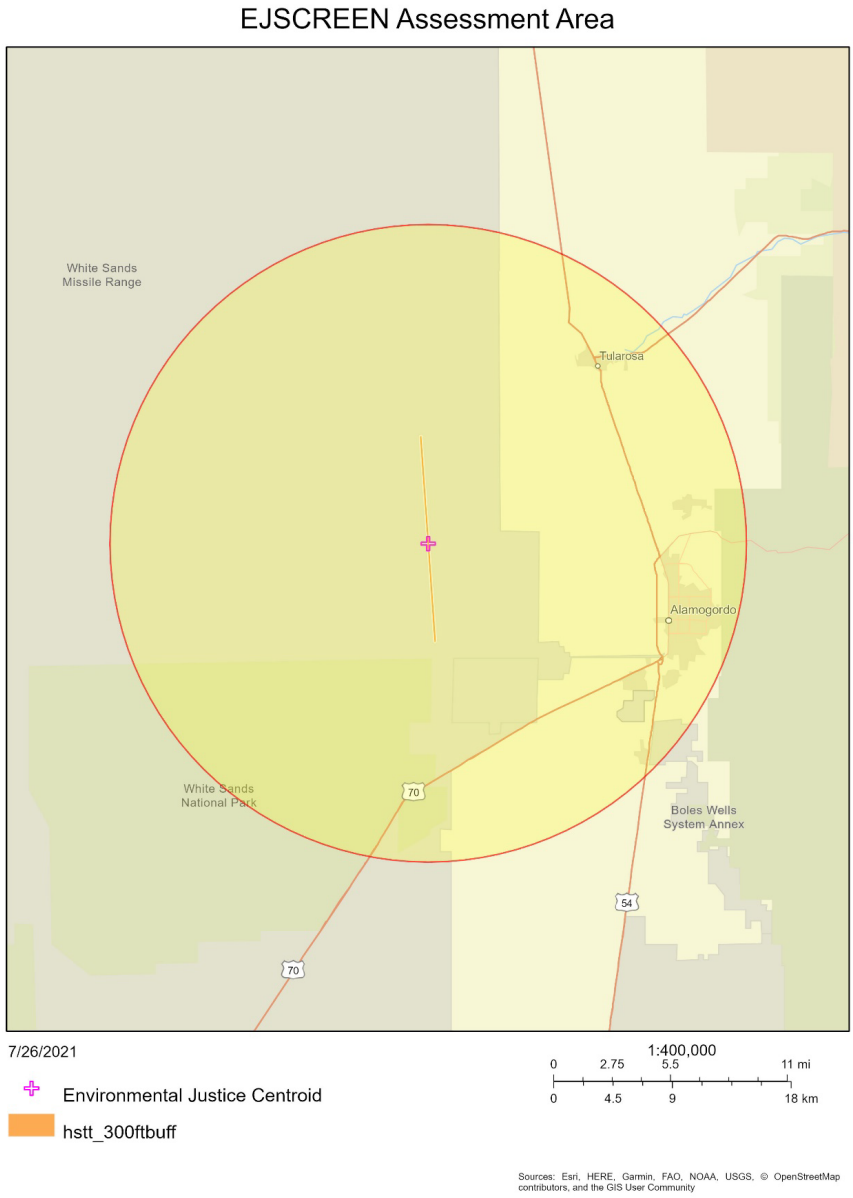

Figure 8. Environmental Justice Survey Area, EPA Online Environmental Justice Screen and Mapping Tool, Version 2020.

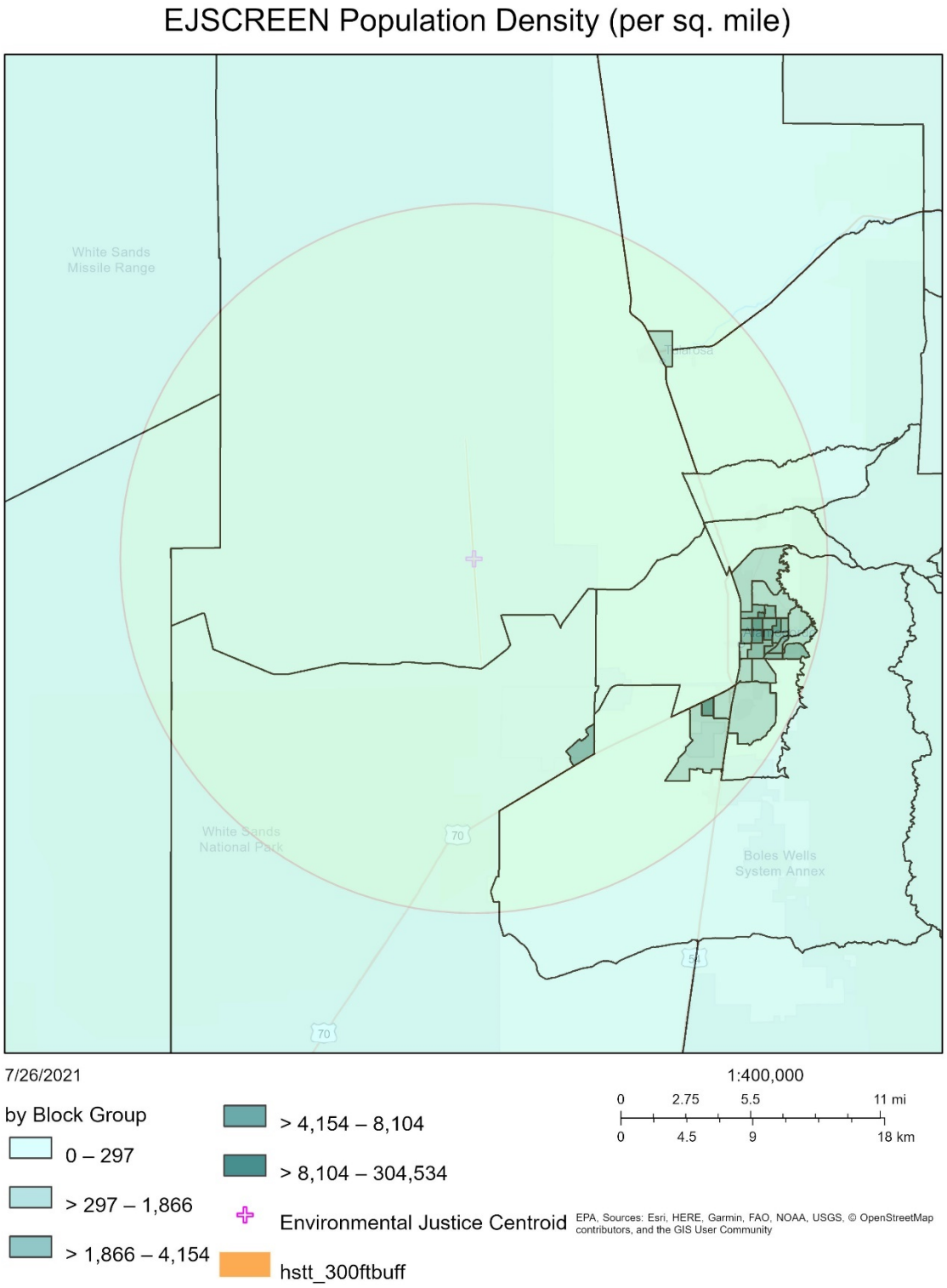

Figure 9. Population Density within a 15-mile buffer centered over the proposed project area.

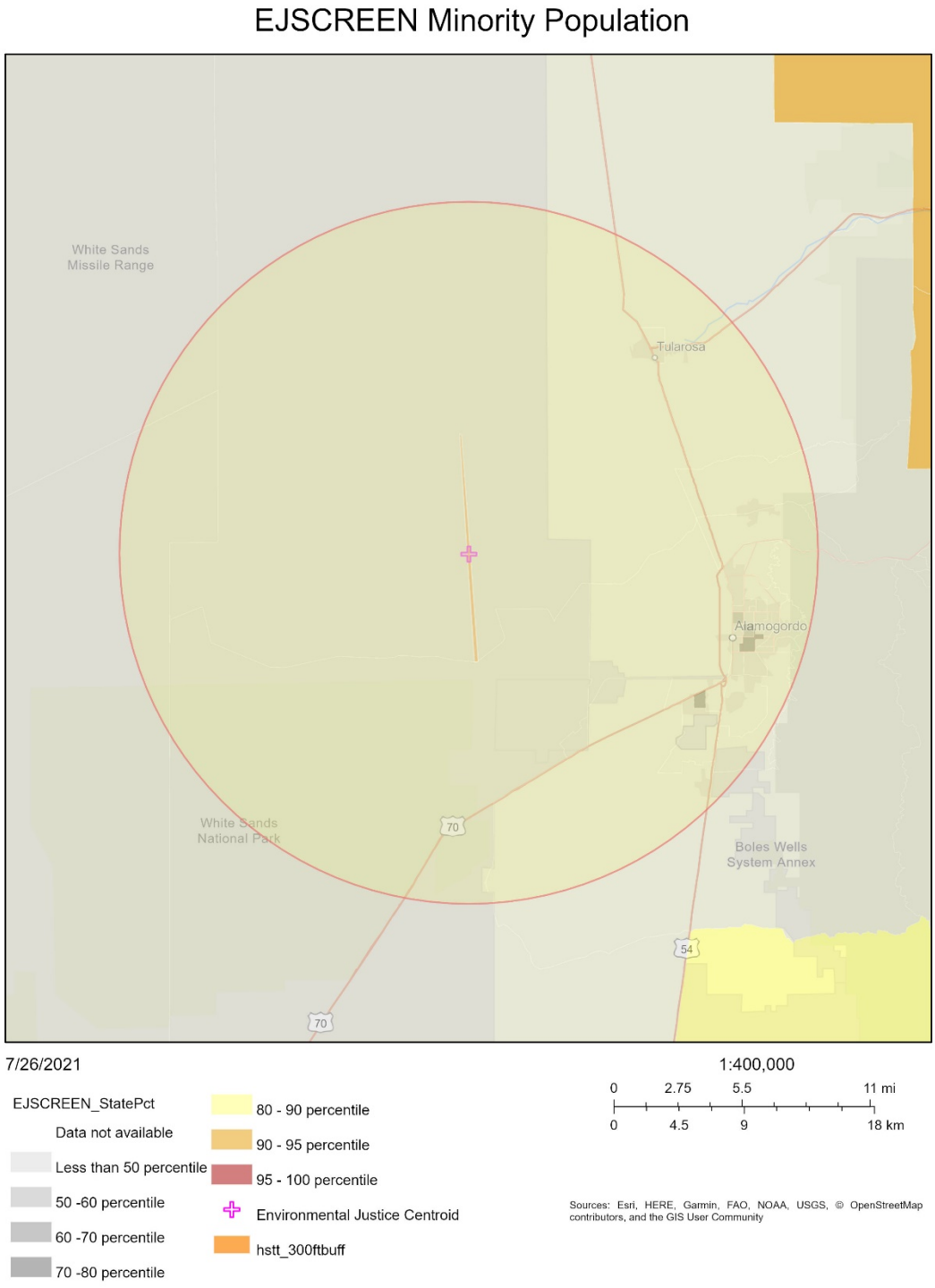

Figure 10. Minority population within a 15-mile buffer centered over the proposed project area.

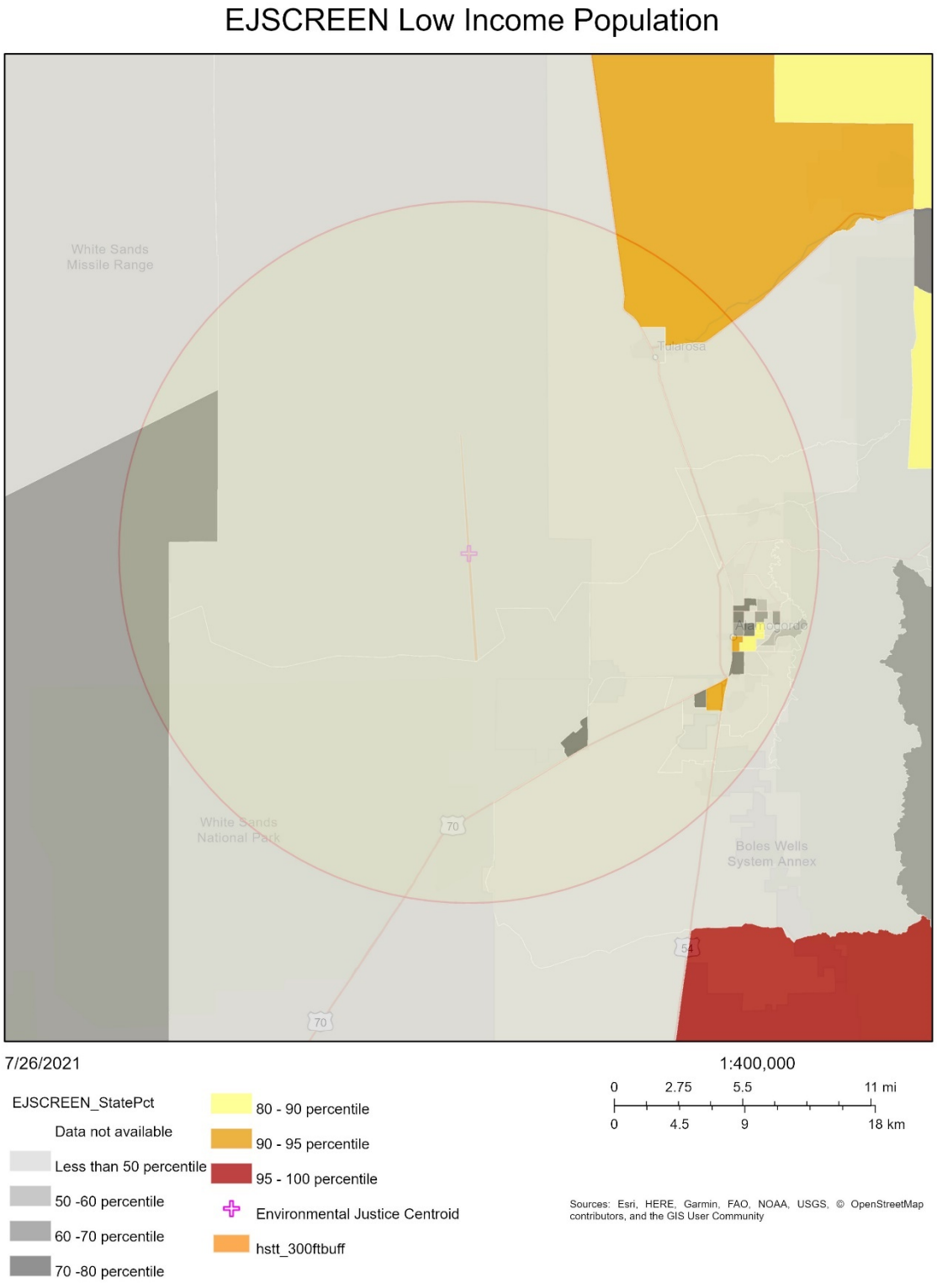

Figure 11. Low Income Population within a 15-mile buffer centered over the proposed project area.

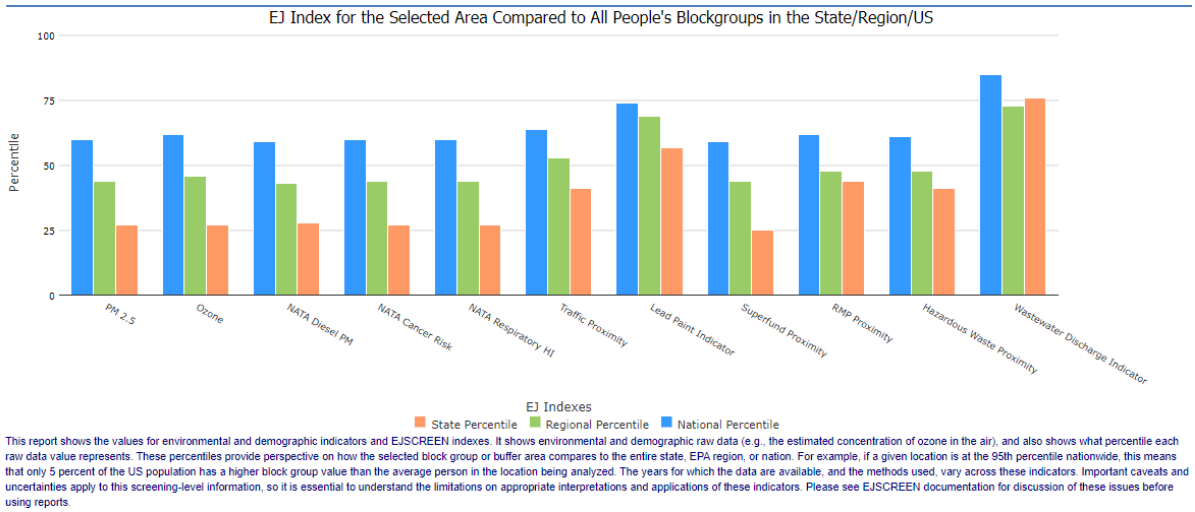

Figure 12. Environmental Justice Indexes Comparison Within a 15-mile Buffer of the Study Area

3.7. HAZARDOUS MATERIALS AND WASTES AND SOLID WASTES

3.7.1. Existing Conditions

Hazardous materials are regulated under the Comprehensive Environmental Response, Compensation and Liability Act, Occupational Safety and Health Act (OSHA), and the Emergency Planning and Community Right-to-Know-Act. Hazardous wastes at the base are managed in accordance with the Holloman AFB Hazardous Waste Management Program (HWMP).

Initial Accumulation Point (IAP) managers are responsible for properly segregating, storing, characterizing, labeling, marking, packaging, and transferring hazardous wastes for disposal from the IAP to HAFB's 90-day storage area according to federal, state, local, and Air Force regulations. The 90-day storage site allows HAFB to store hazardous wastes up to 90 days before transfer to the Defense Logistics Agency Disposition Services. The HHSTT, as a tenant activity on HAFB, controls its own IAPs compliant with the RCRA, and uses the Main Base's 90-day accumulation point under HAFB's Part B permit. Holloman AFB also holds a RCRA permit for handling the disposal and treatment of waste munitions. Solid waste is included in the HAFB solid waste contract with the HHSTT and is also sent to DLADS for reuse/recycling as appropriate. All debris and material are cleaned up after each test and disposed of according to regulation.

Test Track operations and maintenance require the storage and use of hazardous materials, such as flammable and combustible liquids. These wastes include but are not limited to solvents, paints, rags, debris, blast materials, fuel, liquid gases, herbicides, alcohols, and batteries. Additionally, a variety of munitions are used for HHSTT tests, but no munitions used at the HHSTT has hazardous materials that preclude disposal at the 20,000-pound EOD, except the NIKE booster rocket motors that has asbestos. The NIKE booster rocket casing linings contain asbestos are sent to DLADS, which ships them to a RCRA permitted treatment/storage/disposal facility. Other rocket motor casings do not have asbestos and are recycled by DLADS. In addition, no radioactive source materials are permitted for use at the HHSTT.

There are two hazardous waste streams that have been identified by the HHSTT IAP managers—paint facility and the machine shop. In 2020, the paint facility (Building 1178) had both liquid and solid hazardous waste streams that included paint rags, debris, and solvent. In 2021, the Machine Shop had only a liquid hazardous waste stream from used cutting coolant. The HHSTT followed standard operating procedures (SOPs) for the cleanup and disposal of hazardous wastes from the facilities. HazMat would

continue to take samples every four years of the HHSTT facilities to monitor for hazardous waste streams. All existing management procedures and standard operating procedures, which are sufficient to prevent any significant impact on the environment at the base or on the public, would continue for HHSTT Operations and Maintenance.

Installation Restoration Program (IRP)

The HAFB began the Installation Restoration Program in 1983 when the base originally identified 43 sites. The number of sites by 1994 totaled 60. One hundred thirteen (113) Solid Waste Management Units (SWMUs) under the RCRA have been identified by the IRP program. These sites cover a combined area exceeding 500 acres of the installation, mostly within the industrial airfield of the main, west, and north areas of the developed portion of the base. The extent of cleanup in remediation and corrective actions depends on ultimate use of the site, with less cleanup necessary for industrial sites, and more cleanup necessary for residential or other high human uses; most IRP sites are within industrial or commercial zones. Only 25 sites have groundwater contamination; the remaining sites are soil contamination sites. Most sites with soil contamination may be reused after remediation and corrective actions are completed.

IRP Site SS39 east of the southern end of the Test Track is the SWMU near track activities. It was a missile fuel spill area and has been officially closed. The groundwater at the site is being monitored every two years for ten years for specific contaminants.

3.7.2. Environmental Consequences

Alternative 1—No Action Alternative

Under the No Action Alternative, the rainfield modifications would not occur and the existing conditions discussed in section 3.7.1 would remain unchanged. Additionally, the existing operations and tests conducted at the Test Track would remain the same and BMPs discussed under section 2.1 would continue to be followed. Therefore, no impacts to hazardous materials and solid wastes would occur under the No Action Alternative.

Alternative 2—Proposed Action

During rainfield modifications, solid waste would be generated by construction activities to build the pipework, such as but not limited to trash from the contractor. Any solid waste would be recycled to the extent possible and nonrecyclable solid waste would be stored in a waste bin and disposed of in a state permitted landfill. The rainfield modifications would likely entail vehicle and equipment maintenance materials and wastes that would be managed in accordance with established HAFB procedures and would not constitute a significant concern. The operations and maintenance of the proposed rainfield modifications would not increase the quantity of hazardous wastes generated at the HHSTT because operations and maintenance would continue as is. Thus, impacts related to hazardous materials and solid waste would be negligible.

3.8. HEALTH AND SAFETY

3.8.1. Affected Environment

The HAFB is a secure military installation that limits access to authorized personnel. The installation provides emergency services, including fire response, emergency medical services. law enforcement, and force protection to all installation facilities. Therefore, emergency situations can be responded to in a quick and efficient manner.

Ground Safety

Ground safety includes but is not limited to occupational and safety hazards, ground and industrial operations, motor vehicle use, and fire (AFMAN 91-203). Ground accidents may occur on or off the installation, and may involve contractors, Air Force personnel, or property losses. Ground mishaps may occur in a work environment from the use of equipment or materials. Construction and demolition that occurs on the HAFB and the HHSTT are conducted in accordance with all applicable Air Force safety regulations, published Air Force Technical Orders, and Air Force Occupational and Environmental Safety, Fire protection, and Health (AFOSH) requirements. Construction and demolition activities on HAFB must have an appropriate safety plan for the job site that explains safety protocols and procedures that helps to ensure job safety throughout the life of the project.

All USAF contractors are responsible for following the safety and health requirements of the New Mexico State Occupational Safety and Health Act (OSHA) Plan. New Mexico manages their own occupational safety and health program in accordance with the federal OSHA. The Occupational Health and Safety Bureau of the New Mexico Environment Department administers and enforces the state health and safety regulations. All federal employees (i.e., installation personnel) are excluded from State OSHA Plan as they are covered under federal OSHA regulations. Additionally, all personnel are required to follow applicable OSHA requirements as governed by the terms of the contract, which may include Air Force regulations and technical orders instead of AFOSH standards. The Holloman AFB fire and emergency services also meet all established Air Force staffing and equipment standards.

Explosive Safety

Holloman AFB controls, maintains, and stores all ordnance and munitions required for 846th mission in accordance with Air Force and Defense Department Explosive Safety Board (DDESB) safety procedures. All munitions maintenance is carried out by trained and qualified personnel using Air Force-approved technical data for the specific type of ordnance. All live munition storage/operation buildings at the HHSTT are fully certified for the ordnance they store.

Explosive Safety Quantity Distance Arcs

Explosive safety clearance zones or explosive safety quantity distance (ESQD) arcs are established around facilities used for storage, handling, or maintenance of munitions. All ESQD arcs established at the HHSTT follow guidance in the DOD's *Defense Explosive Safety Regulation* (DESR) 6055.09 and the Air Force Manual (AFMAN) 91-201, *Explosives Safety Standards*. The DESR 6055.09 and the AFMAN 91-201 establish requirements for the size of the clearance zone based on quantity-distance criteria and the category and weight of the explosives contained within the facility. The ESQD arcs (also called explosive arcs) cover a range in size depending on the type and quantity of explosive. The ESQD arcs at the HHSTT include a wider area around the impact and detonation area at the north end of the Track, the horizontal test stand, and explosive storage and operation buildings. A more detailed description of the ESQD arcs is in Section 2.1, Description of the Existing High Speed Test Track Facilities.

3.8.2. Environmental Consequences

Alternative 1—No Action Alternative

Under the No Action Alternative, the existing conditions discussed in section 3.8.1 would remain unchanged. Furthermore, the operations and tests conducted at the Test Track would remain the same as discussed under section 2.1. Therefore, no impacts to health and safety would occur under the No Action Alternative.

Alternative 2—Proposed Action

The proposed rainfield modifications are reasonably expected to not create new safety and health issues. Operations and maintenance procedures conducted by HHSTT personal would not change from current

conditions. All activities would continue to be conducted in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and AFOSH requirements. All ordnance and munitions required for the 846th mission would continue to be controlled, maintained, and stored in accordance with the Air Force and DDESB safety procedures and all munitions maintenance carried out by trained and qualified personnel. In addition, the Air Force and DDESB procedures require safeguards on weapons systems and ordnances that ensure no inadvertent releases.

Construction activities of the rainfield pipe system would comply with all OSHA regulations to protect workers. Health and safety risks for construction workers are related to the operation of heavy equipment, working around heavy equipment, and working in the vicinity of utilities. These activities pose a risk of physical injury associated with auto accidents, contacting moving equipment, or fire from a punctured utility line. Construction teams would be required to wear personal protective equipment (PPE), such as but not limited to reflective vests, ear protection, hard hats, and safety toed boots. Impacts to health and safety from construction of the proposed additional rainfield pipe system would be minimal with the implementation of best management practices and adherence to OSHA regulations.

4. List of Contributors

HHSTT and Holloman AFB Staff

Dan Bernal, 846 TS/TGTCD, Civil Engineer

Jeffrey Coon, 704 TG/TGSO, Environmental Specialist

Jennifer Fredrick, 49 CES/CEIE, Archeologist, Cultural Resources Manager

Andrew Gomolak Jr, 49 CES/CEIE, Project Specialist

David Griffin, 49 CES/CEIE, Senior Technical Advisor

Scott Grubb, 846 TS, Operations Flight Chief

Lee Powell, 846 TS, Capability Development Lead

William Reynolds, 846 TS/UEC, Hazardous Materials Management

Martha Whipple, 49th Wing Historian

BRIC LLC

Timothy Goddard, Cultural Resources Manager

Erin Greenlee, NEPA Specialist and Biologist

Stephanie Lee, Project Manager and NEPA/GIS Specialist

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APPENDIX A. T&E SPECIES LISTS

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: November 08, 2021
Consultation Code: 02ENNM00-2021-SLI-1376
Event Code: 02ENNM00-2022-E-00295
Project Name: Holloman EA

Subject: Updated 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-1376
Event Code: Some(02ENNM00-2022-E-00295)
Project Name: Holloman EA
Project Type: MILITARY OPERATIONS / MANEUVERS
Project Description: This PEA supports a proposal by the United States Air Force, 846th TS of Holloman Air Force Base to make minor modifications to the HHSTT while continuing to operate and maintain the facility. The proposal to continue operations of the HHSTT with modifications would include installing additional rain field capability within the existing built environment.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@32.954697800000005,-106.15575549369123,14z

Counties: Otero County, New Mexico

Endangered Species Act Species

There is a total of 12 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.

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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
Penasco Least Chipmunk *Tamias minimus atristriatus* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5126	Proposed 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
Northern Aplomado Falcon *Falco femoralis septentrionalis* Population: U.S.A (AZ, NM) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1923	Experimental Population, Non-Essential
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 Cutthroat Trout *Oncorhynchus clarkii virginalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/920	Candidate

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Kuenzler Hedgehog Cactus *Echinocereus fendleri var. kuenzleri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2859	Threatened
Sacramento Mountains Thistle *Cirsium vinaceum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7486	Threatened
Sacramento Prickly Poppy *Argemone pleiacantha ssp. pinnatisecta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3332	Endangered
Todsen's Pennyroyal *Hedeoma todsenii* 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/1081	Endangered
Wright's Marsh Thistle *Cirsium wrightii* Population: There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8963	Proposed Threatened

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.

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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
Cassin's Sparrow *Aimophila cassinii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9512	Breeds Aug 1 to Oct 10
Chestnut-collared Longspur *Calcarius ornatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere

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 (|)

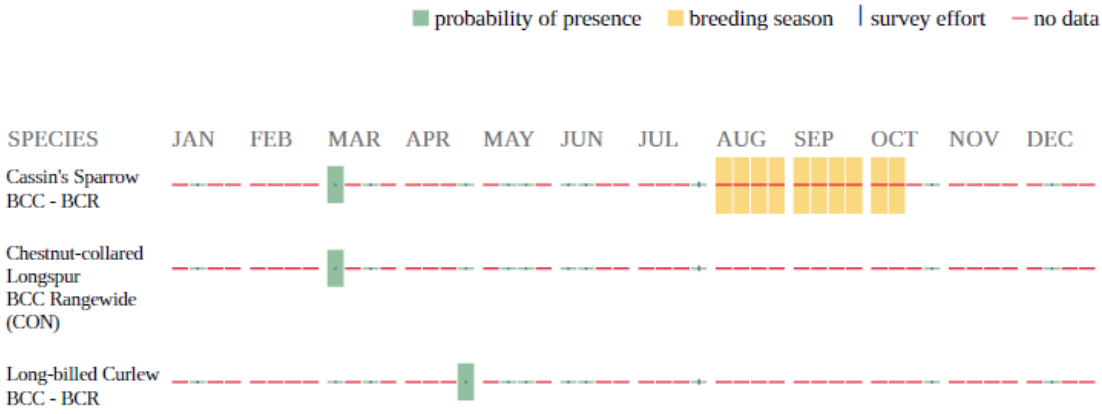
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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 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.

PROJECT INFORMATION

Project Title:	PEA for Holloman High Speed Test Track
Project Type:	MILITARY, GENERAL (OPERATIONS, INFRASTURCTURE), MAINTENANCE OR CONTINUING OPERATIONS, INFRASTRUCTURE
Latitude/Longitude (DMS):	32.954710 / -106.155726
County(s):	OTERO
Project Description:	The USAF and 846th TS propose to continue operations of the HHSTT with modifications. The HHSTT is a tenant activity on Holloman Air Force Base (HAFB), under Air Force Material Command at Wright-Patterson AFB in Ohio, and the Air Force Test Center at Edwards AFB in California, that serves both domestic and international clients. The operations would be modified with proposed infrastructure on the east side of the track to move the rainfield valve sets and updated best management practices and management actions as standard operating procedures identified in Chapter 4. Under Alternative 2, the 6,000 feet of rainfield over the A rail would remain and infrastructure for two additional rainfield areas would be installed on the east side over the narrow gauge system, with one directly across from the existing rainfield and one due south as needed to support test requirements between TS 15,300 and 27,300. The proposed infrastructure would consist of installing pipework on the east side of the track on the existing asphalt access roadway adjacent to the track (Figure 5). The remote valves for the rainfields are mounted on skids and moved by forklifts to attach to the pipework and may be moved and operated at any of the rainfields. Only one of the three available 6,000-foot rainfields would be operated at a time therefore the existing pump and pumphouse would remain as is. The east side of the track where the new valves sets are proposed are within the built upon environment, and is within the area impacted by past and current maintenance and operations.

REQUESTOR INFORMATION

Project Organization:	US DOD - AIR FORCE
Contact Name:	Stephanie Lee
Email Address:	stephanie.lee@bric-dine.com
Organization:	BRIC LLC
Address:	8901 Adams Street, Suite B, Albuquerque, Albuquerque NM 87113
Phone:	5055634702

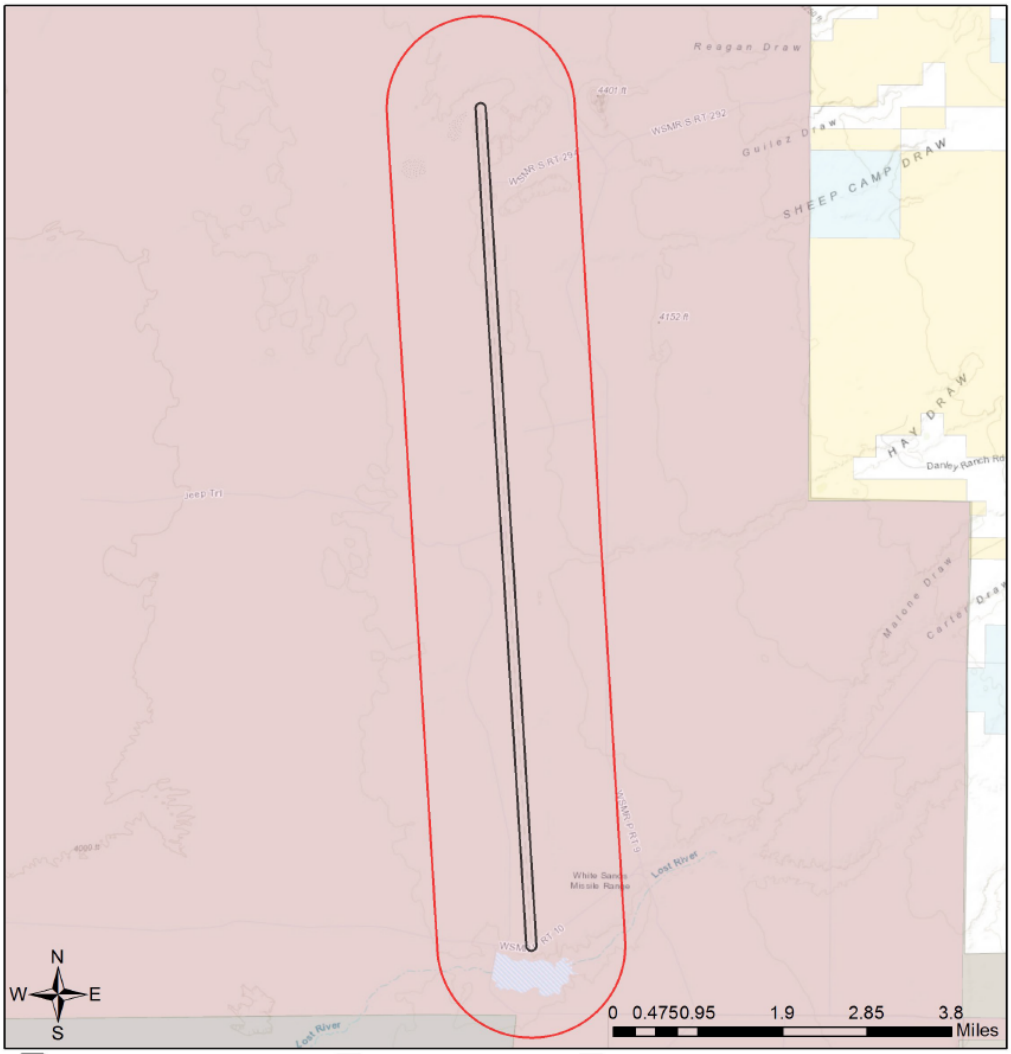
OVERALL STATUS

The information contained within this report comprises the recommendations of the New Mexico Department of Game and Fish (Department) for management and mitigation of proposed project impacts to wildlife and habitat resources; see the Project Recommendations section below for further details. No further consultation with the Department is required based on the project's location and, with implementation of mitigation measures described in the Project Recommendations section below, no adverse effects to wildlife or important habitats are anticipated. However, a Department biologist may be in touch within 30 days if they determine that further review is required.

About this report:

- This environmental review is based on the project description and location that was entered. The report must be updated if the project type, area, or operational components are modified.
- This is a preliminary environmental screening assessment and report. It is not a substitute for the potential wildlife knowledge gained by having a biologist conduct a field survey of the project area. Federal status and plant data are provided as a courtesy to users. The review is also not intended to replace consultation required under the federal Endangered Species Act (ESA), including impact analyses for federal resources from the U.S. Fish and Wildlife Service (USFWS) using their Information for Planning and Consultation tool.
- The New Mexico Environmental Review Tool (ERT) utilizes species observation locations and species distribution models, both of which are subject to ongoing change and refinement. Inclusion or omission of a species within a report can not guarantee species presence or absence at a precise point location, as might be indicated through comprehensive biological surveys. Specific questions regarding the potential for adverse impacts to vulnerable wildlife populations or habitats, especially in areas with a limited history of biological surveys, may require further on-site assessments.
- The Department encourages use of the ERT to modify proposed projects for avoidance, minimization, or mitigation of wildlife impacts. However, the ERT is not intended to be used in a repeatedly iterative fashion to adjust project attributes until a previously determined recommendation is generated. The ERT serves to asses impacts once project details are developed. The New Mexico Crucial Habitat Assessment Tool is the appropriate system for advising early-stage project planning and design to avoid areas of anticipated wildlife concerns and associated regulatory requirements.

PEA for Holloman High Speed Test Track



- Project Boundary
- Buffered Project Boundary

NM_SurfaceOwnership_2016

- Bureau of Land Management
- Bureau of Reclamation
- US Dept. of Agriculture
- Military
- Dept. of Energy
- US Forest Service
- Wildlife Area/Refuge
- Tribal
- National Park/Mon.
- Private
- State Land Office
- NM Game & Fish Dept.
- State Park

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Special Status Animal Species within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI
Cooper's Hawk	Accipiter cooperii			SGCN
Common Black-Hawk	Buteogallus anthracinus		T	SGCN
Ferruginous Hawk	Buteo regalis			SGCN
Golden Eagle	Aquila chrysaetos			SGCN
Aplomado Falcon	Falco femoralis		E	SGCN
Peregrine Falcon	Falco peregrinus		T	SGCN
Western Burrowing Owl	Athene cunicularia hypugaea			SGCN
Lewis's Woodpecker	Melanerpes lewis			SGCN
Pinyon Jay	Gymnorhinus cyanocephalus			SGCN
Juniper Titmouse	Baeolophus ridgwayi			SGCN
Pygmy Nuthatch	Sitta pygmaea			SGCN
Bendire's Thrasher	Toxostoma bendirei			SGCN
Crissal Thrasher	Toxostoma crissale			SGCN
Sprague's Pipit	Anthus spragueii			SGCN
Loggerhead Shrike	Lanius ludovicianus			SGCN
Bell's Vireo	Vireo bellii		T	SGCN
Gray Vireo	Vireo vicinior		T	SGCN
Chestnut-Collared Longspur	Calcarius ornatus			SGCN
White Sands Pupfish	Cyprinodon tularosa		T	SGCN
Spotted Bat	Euderma maculatum		T	SGCN
Black-Tailed Prairie Dog	Cynomys ludovicianus			SGCN
White Sands Woodrat	Neotoma micropus leucophaea			SGCN
Texas Horned Lizard	Phrynosoma cornutum			SGCN
Cougar	Puma concolor			SERI
Mule Deer	Odocoileus hemionus			SERI

ESA = Endangered Species Act, WCA = Wildlife Conservation Act, SGCN = Species of Greatest Conservation Need, SERI = Species of Economic and Recreational Importance

Special Status Plant Species within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMAC	NMRPCS
Grama Grass Cactus	Sclerocactus papyracanthus			SS

NMAC = New Mexico Administrative Code, NMRPCS = New Mexico Rare Plant Conservation Strategy, SS = NM Rare Plant Conservation Strategy Species

Project Recommendations

With implementation of the applicable mitigation or avoidance measures included in the project description, and incorporation of the guidance listed below, the Department does not anticipate significant impacts to wildlife or sensitive wildlife habitats from the proposed project activities. See the "OVERALL STATUS" section above to determine the likelihood that your project will be reviewed further based on its location. If a Department biologist determines that additional conservation measures are needed, then you should expect to receive notification and/or any additional project recommendations within 30 days of your project submission.

Burrowing owl is known to occur within or near your project area. Before any ground disturbing activities occur, the Department recommends that a preliminary survey be conducted between April and September, using the Department's burrowing owl survey protocol. Should burrowing owls be documented in the project area, please contact the Department or USFWS for further recommendations regarding relocation or avoidance of impacts.

The proposed project occurs within or near a riparian area. Because riparian areas are important wildlife habitats, the project footprint should avoid removing any riparian vegetation or creating ground disturbance either directly within or affecting the riparian area. If your project involves removal of non-native riparian trees or planting of native riparian vegetation, please refer to the Department's habitat handbook guideline for Restoration and Management of Native and Non-native Trees in Southwestern Riparian Ecosystems.

Disclaimers regarding recommendations:

- The Department provides technical guidance to support the persistence of all protected species of native fish and wildlife, including game and nongame wildlife species. Species listed within this report include those that have been documented to occur within the project area, and others that may not have been documented but are projected to occur within the project vicinity.
- Recommendations are provided by the Department under the authority of § 17-1-5.1 New Mexico Statutes Annotated 1978, to provide "communication and consultation with federal and other state agencies, local governments and communities, private organizations and affected interests responsible for habitat, wilderness, recreation, water quality and environmental protection to ensure comprehensive conservation services for hunters, anglers and nonconsumptive wildlife users".
- The Department has no authority for management of plants or Important Plant Areas. The New Mexico Endangered Plant Program, under the Energy, Minerals, and Natural Resources Department's Forestry Division, identifies and develops conservation measures necessary to ensure the survival of plant species within New Mexico. Plant status information is provided within this report as a courtesy to users. Recommendations provided within the ERT may not be sufficient to preclude impacts to rare or sensitive plants, unless conservation measures are identified in coordination with the Endangered Plant Program.
- Additional coordination may also be necessary under the federal ESA or National Environmental Policy Act (NEPA). Further site-specific recommendations may be proposed during ESA and/or NEPA analyses, or through coordination with affected federal agencies.

APPENDIX B. ENVIRONMENTAL JUSTICE SCREEN AND MAPPING TOOL REPORT

United States Environmental Protection Agency

EJSCREEN Report (Version 2020)

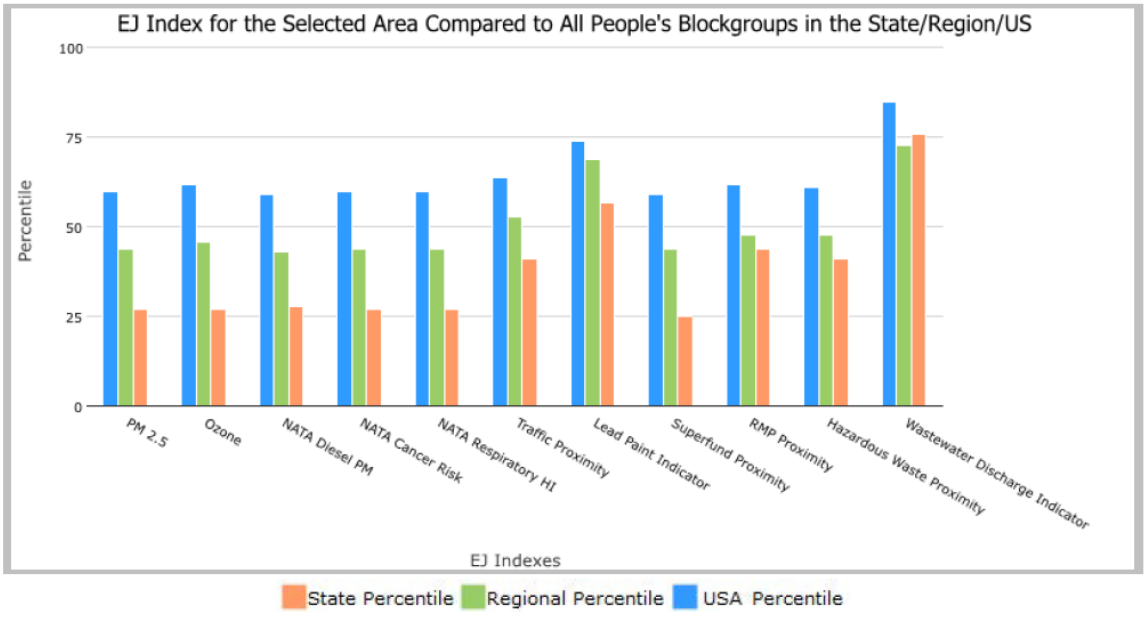
15 miles Ring Centered at 32.951640,-106.155396, NEW MEXICO, EPA Region 6

Approximate Population: 46,313

Input Area (sq. miles): 706.66

Environmental Justice Centroid

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	27	44	60
EJ Index for Ozone	27	46	62
EJ Index for NATA* Diesel PM	28	43	59
EJ Index for NATA* Air Toxics Cancer Risk	27	44	60
EJ Index for NATA* Respiratory Hazard Index	27	44	60
EJ Index for Traffic Proximity and Volume	41	53	64
EJ Index for Lead Paint Indicator	57	69	74
EJ Index for Superfund Proximity	25	44	59
EJ Index for RMP Proximity	44	48	62
EJ Index for Hazardous Waste Proximity	41	48	61
EJ Index for Wastewater Discharge Indicator	76	73	85



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

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EJSCREEN Report (Version 2020)

15 miles Ring Centered at 32.951640,-106.155396, NEW MEXICO, EPA Region 6

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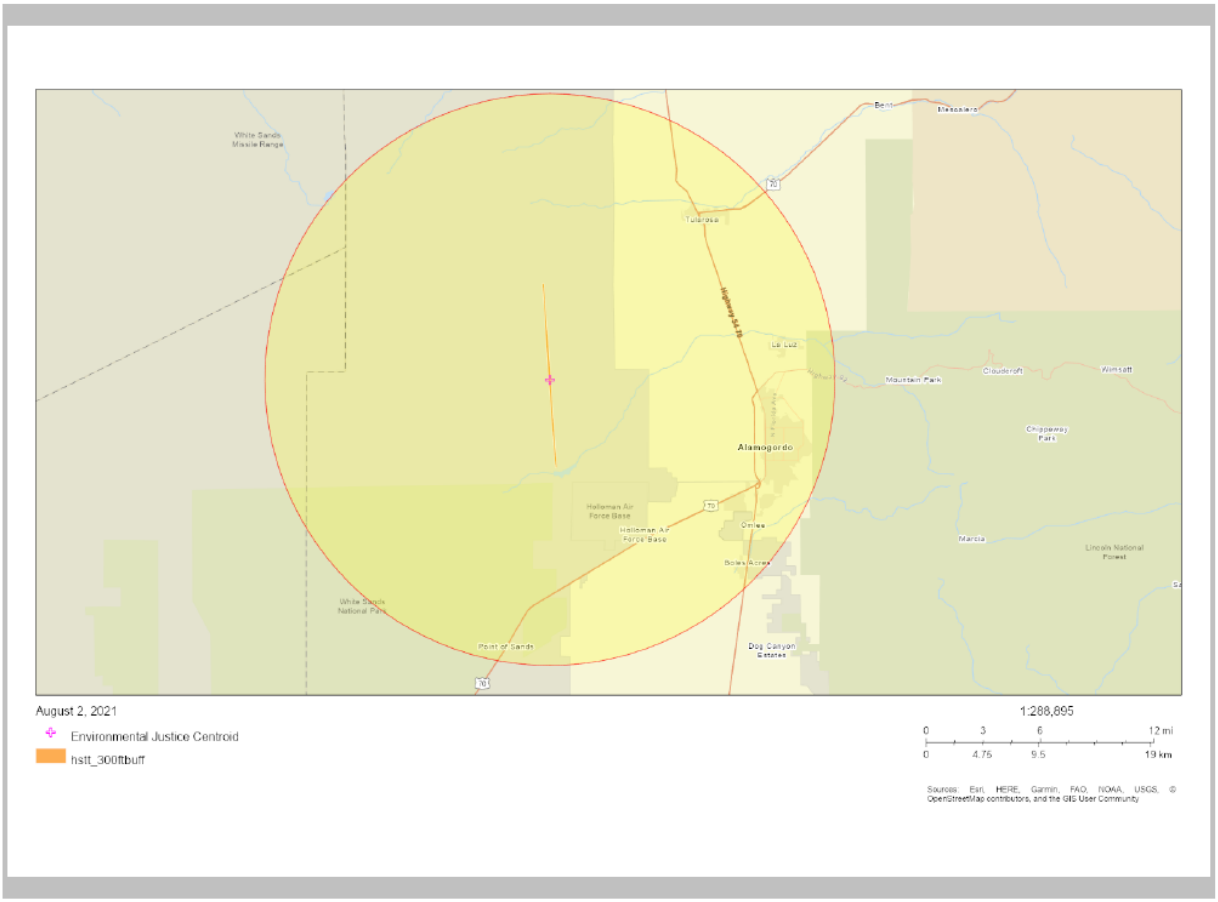
Environmental Justice Centroid



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

EJSCREEN Report (Version 2020)

15 miles Ring Centered at 32.951640,-106.155396, NEW MEXICO, EPA Region 6

Approximate Population: 46,313

Input Area (sq. miles): 706.66

Environmental Justice Centroid

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	5.82	6.17	33	8.95	1	8.55	3
Ozone (ppb)	49.8	52.2	11	41.8	92	42.9	87
NATA* Diesel PM (µg/m³)	0.0946	0.281	26	0.401	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	19	25	25	36	<50th	32	<50th
NATA* Respiratory Hazard Index	0.23	0.32	21	0.45	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	120	360	43	400	45	750	38
Lead Paint Indicator (% Pre-1960 Housing)	0.19	0.18	67	0.17	71	0.28	51
Superfund Proximity (site count/km distance)	0.012	0.13	15	0.081	9	0.13	7
RMP Proximity (facility count/km distance)	0.13	0.24	54	0.82	20	0.74	23
Hazardous Waste Proximity (facility count/km distance)	0.13	0.78	39	0.99	26	5	18
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.00086	150	69	9.5	58	9.4	65
Demographic Indicators							
Demographic Index	40%	52%	30	44%	48	36%	63
People of Color Population	42%	62%	20	52%	43	39%	60
Low Income Population	38%	42%	46	37%	55	33%	65
Linguistically Isolated Population	3%	5%	45	6%	51	4%	60
Population With Less Than High School Education	11%	15%	45	16%	45	13%	57
Population Under 5 years of age	7%	6%	64	7%	55	6%	65
Population over 64 years of age	18%	16%	64	13%	77	15%	68

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

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