Environmental Assessment
for the
NASA White Sands Test Facility
300 Area Altitude Capability Demolition Project

National Aeronautics and Space Administration

June 10, 2020

Environmental Assessment
for the
NASA White Sands Test Facility
300 Area Altitude Capability Demolition Project

Location:	The White Sands Test Facility (WSTF) is located in Doña Ana County, New Mexico
Lead Agency:	National Aeronautics and Space Administration (NASA), Johnson Space Center (JSC), WSTF
Proposed Action:	NASA proposes to demolish the 300 Area altitude testing capability which would transition the 300 Area to an ambient only propulsion system testing configuration. Additionally, NASA proposes reconditioning and repurposing some of the 300 Area altitude facility assets within the 400 Area.
For Further Information:	Timothy J. Davis, Chief NASA Environmental Office (RE) P.O. Box 20 Las Cruces, NM 88004 575-524-5024 timothy.j.davis@nasa.gov
Date:	June 10, 2020

Executive Summary

The National Aeronautics and Space Administration (NASA) White Sands Test Facility (WSTF) proposes to significantly modify the propulsion testing capability within the 300 Area. The 300 Area is a highly specialized rocket and spacecraft engine propulsion testing area that can provide engine testing at both altitude and ambient conditions. Since 2015, the altitude testing capability was temporarily removed from service and the facilities were placed into a non-active status. NASA proposes to demolish, repair, and potentially replace several properties and related infrastructure within the footprint of the 300 Area which would remove all altitude testing capabilities and convert the area to an ambient-only testing capability. Additionally, portions of the facilities and equipment may be reconditioned and consolidated within the 400 Area propulsion test capability.

This altitude capability demolition and reconfiguration plan would align with a 20-year master planning effort while consolidating and simplifying operations, reducing routine maintenance and operational costs, minimizing long-term environmental liability, mitigating environmental compliance risk, and increasing energy efficiency. The project is expected to commence in late 2020 and would require up to 24 months to complete all activities.

This EA (Environmental Assessment) describes the proposed actions to decommission and demolish altitude test capabilities at WSTF while transitioning and consolidating some facilities and associated equipment within the 400 Area. Additionally, the no action alternative is evaluated and considered.

Table of Contents

1. Purpose and Need for the Proposed Action

1.1. Introduction

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] §§ 4321-4370d), and according to the Procedures of Implementation of NEPA for the National Aeronautics and Space Administration (NASA) (Title 14, Code of Federal Regulations [CFR], part 1216, subparts 1216.1 and 1216.3, 2012). This EA considers a proposed action to demolish and reconfigure a portion of the White Sands Test Facility (WSTF) which would consolidate altitude propulsion test activities within the 400 Area while maintaining only ambient propulsion test capabilities within the 300 Area. Additionally, the no-action alternative is considered in this analysis.

WSTF is a component facility of the Johnson Space Center (JSC) and is located approximately eleven miles northeast of Las Cruces, New Mexico (Figure 1). WSTF was established by NASA in 1963 to support propulsion system testing for the Apollo Program.

Figure 1 – WSTF Location

The WSTF mission is to provide the expertise and infrastructure to test and evaluate spacecraft materials, components, and propulsion systems to enable the safe exploration and use of space. WSTF is organized by specific areas which are dedicated to certain operational functions. These areas are described as follows:

- 100 Area – Administration Area
- 200 Area – Laboratories
- 300 Area – Propulsion Test Area
- 400 Area – Propulsion Test Area
- 500 Area – Propellant Management Area

- 600 Area – Infrastructure and Environmental Area
- 700 Area – High Energy Blast Facility
- 800 Area – Materials Test Area

NASA performs a vast array of testing programs in these areas to accommodate NASA programs and various project activities, as well as other government agency and commercial industry requirements. This testing includes rocket propulsion system testing at both ambient and altitude conditions, hypergolic propellant and aerospace fluids analyses and testing, oxygen system testing, hypervelocity impact testing, composite overwrap pressure vessel (COPV) evaluations, flight acceptance standard test programs, high energy detonation testing, and spaceflight component services.

As NASA embarks on new missions and supports associated programs with a vast array of customers, these functional areas and associated testing operations are evaluated, modified, upgraded, and even replaced when appropriate to best support the overall agency goals.

1.2. Background

NASA completed a long-term facility master planning effort that reviewed and evaluated current test facilities and infrastructure against expected future use requirements. The resulting master plan proposed extensive facility changes including consolidations, demolitions, repairs, modifications, renovations, and new construction that would best position WSTF for the future.

This master planning effort was performed in conjunction with strategic alignment and consolidation efforts by the NASA Rocket Propulsion Test (RPT) Program as well as considerations for the “reduce the footprint” mandate that is intended to minimize real property square footage while saving energy and maintenance resources. One of the results from these various reviews and planning efforts was a proposal to eliminate all altitude test capability within the 300 Area which would effectively convert all test facilities to an ambient testing operation. As part of this conversion operations, some 300 Area Propulsion Test capability may be reconditioned and repurposed within the footprint of the 400 Area Propulsion Test Area.

1.3. Purpose and Need of the Proposed Action

The primary purpose and need for this action are to better manage the WSTF altitude and ambient testing capabilities by consolidating activities at either the 300 Area or 400 Area. Additionally, this effort would follow master planning guidelines and demolish some currently inactive facilities which reduces the overall real property footprint and saves energy, water, and routine maintenance requirements. Some elements of the 300 Area altitude systems are similar to those in the 400 Area. Therefore, some existing systems and structures may be salvaged, reconditioned, and moved to the 400 Area to support altitude test capabilities while some remaining 300 Area structures may be rebuilt or upgraded for future use. Overall, this would require an extensive mix of demolition, construction, and refurbishment activities throughout the areas.

1.4. Public Outreach and Involvement

Public outreach and involvement activities include publishing a synopsis in a local newspaper, providing information within both the general readership area and the legal section of the publication. This publication would initiate a 30-day public notice period where the public can access the documentation on-line or request a hard copy. All public comments would be captured and dispositioned in Attachment A.

2. Description of the Proposed Action and Alternatives

2.1. Proposed Action Overview

The 300 Area is in the northeast corner of the WSTF industrial area (Figure 2) and can support both altitude and ambient propulsion system test activities. However, for many years the altitude systems have been decommissioned and maintained in a non-active status.

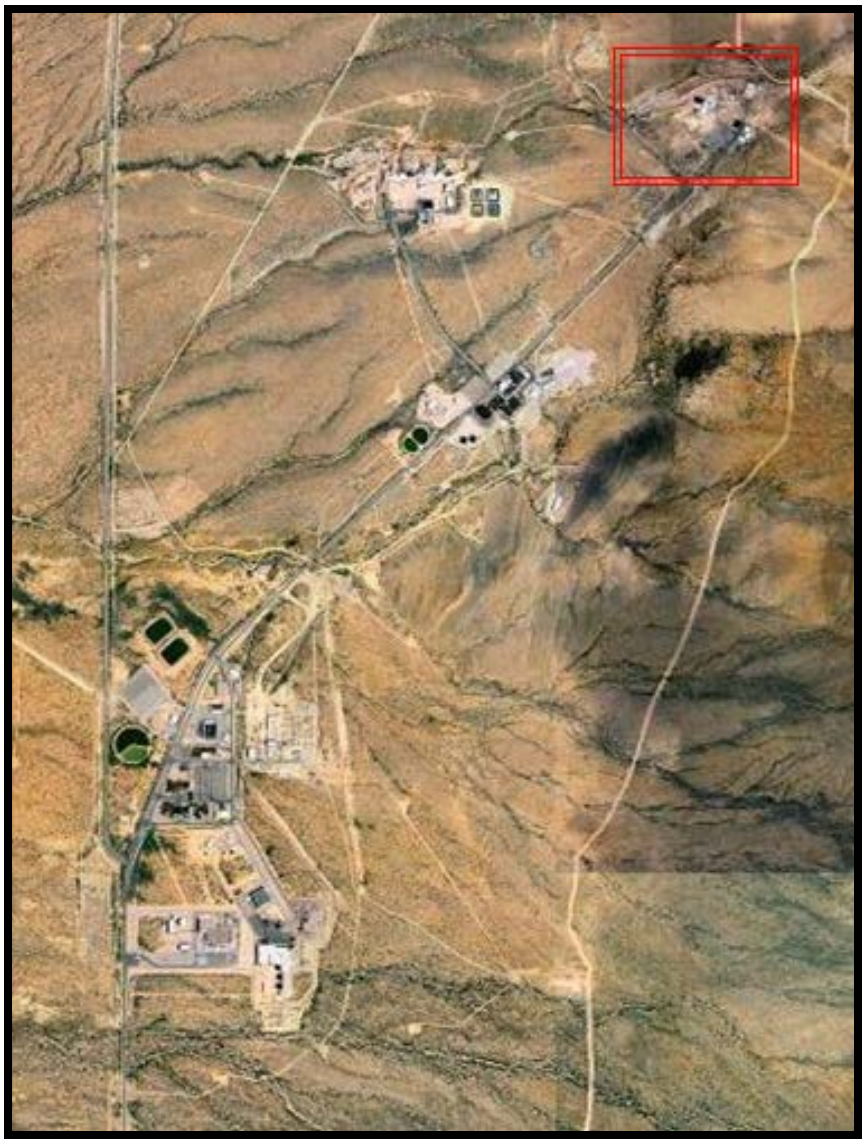

Figure 2 – 300 Area Location

The affected areas within the 300 Area are identified in Figure 3. This area is also depicted in Figure 4, looking southeast from the back of Test Stand 302. Activities would consist of several phases which are expected to begin in late 2020 and take approximately 24 months from initiation to completion. These phases would include extensive project planning, large-scale decontamination efforts, hazardous material abatements, historic recordation, relocation and storage of equipment and structures, demolition work, and disposal of materials.

Additionally, some new construction and restoration or rehabilitation and reuse of current facilities may occur depending on project requirements.

Figure 3 – Affected Altitude Propulsion Test Area

Figure 4 – Altitude Propulsion Test Area (view looking southeast)

Some of the altitude capability systems may be transferred to the 400 Area where they would be reconditioned and reinstalled to enhance current altitude test capabilities. This may include the Test Stand 302 vessel (shell) and associated altitude system components, including the boiler system. Figure 5 provides a graphical representation of the overall project scope. Specific details describing the various phases of this project are described in Sections 2.1.1 through 2.1.6.

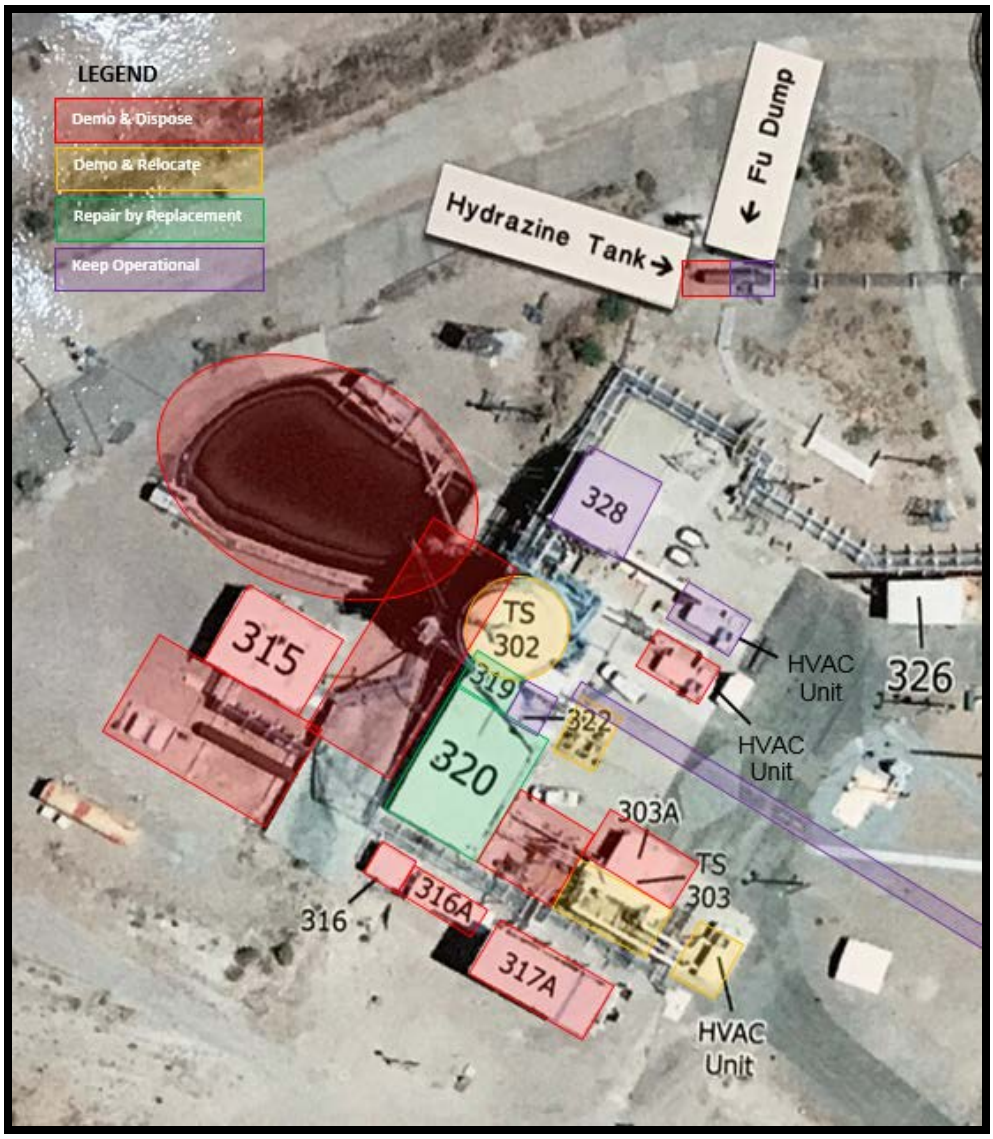

Figure 5 – Overall Project Scope

2.1.1. General Description of Activities

The primary objective in the first phase of the project is to decontaminate, demolish, and dispose of the hydrazine conditioning unit, piping systems, dump tank, and connected equipment. Additionally, a new technician office and shop structure would be designed and built (as needed) to replace Buildings 319 and 320 which would be demolished during a later phase of the project. This new construction proposal is currently an option within the overall design and may or may not be completed depending on a later evaluation of project requirements. This would be followed by dismantling all altitude equipment installed at Test Stand 302, Test Stand 303, Building 319, and most of the connected equipment. This equipment would then be transported to a nearby short-term storage location for reuse.

In the next phase, NASA would demolish the Test Stand 302 and 303 HVAC ducting and

support structures, as well as Buildings 303A, 316, and 316A along with all the ancillary equipment. During this phase of the project, NASA intends to store and potentially reuse the Test Stand 302 vessel and lid, the Test Stand 303 vessel and HVAC unit, the Building 315 boiler, and the vacuum system. Some facilities would remain operational after the completion of this project. These facilities include Test Stand 328, the fuel and oxidizer dump systems, control and instrumentation systems for Test Stand 328, and systems from Building 312 and Building 322.

In coordination with the construction and demolition crews, the WSTF environmental program would oversee the investigation and closure of the Test Stand 302 cooling pond system. Additionally, the WSTF Cultural Resources Manager would coordinate with the NM Historic Preservation Division (HPD) and any consulting parties to ensure that all Section 106 consultation and associated mitigation efforts are completed since the 300 Area is a designated historic district and many of the affected structures are contributing properties within this district.

2.1.2. Phase 1 - Demolition and Disposal

The specific structures and equipment destined for demolition and disposal are described as follows:

- Hydrazine conditioning unit, piping, dump tank, and all connected equipment.
- Building 315 boiler building and connected equipment except for the boiler, which would be transported and stored in a designated location for possible reconditioning and reuse within the 400 Area.
- Altitude equipment installed at Test Stand 302, Test Stand 303, the exterior of Building 319, and all connected equipment except for the vacuum pump/blower sets, which would be transported and stored in a designated location for possible reuse within the 400 Area.
- The 302 cooling pond system, the cooling pond leak detection systems, and all altitude equipment installed at the 300 Area cooling pond.
- Test Stand 302 and 303 HVAC ducting, support structures, Building 303A, and all connected equipment.
- Building 316, Tank 316A, and all connected equipment.
- Power, controls, and instrumentation systems for Test Stand 302, Test Stand 303, altitude systems, and the hydrazine system.
- Facility connections, fire detection, UV detectors, and deluge (Firex) systems associated with all areas identified above.

2.1.3. Phase 2 - Dismantle and Relocation

Some structures and ancillary equipment would be dismantled and relocated to temporary storage before possible reconditioning and reuse within the 400 Area. These areas are described as follows:

- Test Stand 302 and 303 stands.
- Test Stand 303 HVAC unit after removal from stand.

- Boiler that is removed from Building 315.
- Vacuum pumps, blowers, controls, and all mounting components.

2.1.4. Phase 3 - Repair and Replacement

Buildings 319 and 320 may be replaced, if needed, with a new consolidated facility outside of the testing area. This is currently optional within the overall design, and would be evaluated later in the project, but is consistent with the approved facility master plan which strives to improve personnel safety and address long-term operational goals. The new location would allow technicians to work on projects while testing is on-going which is more efficient and effective than current operations.

2.1.5. Phase 4 - Evaluate Operational Facilities

Several structures, buildings, and equipment would be evaluated and maintained as operational during the project. Minor reconditioning and repairs may be required after evaluation. These areas are as follows:

- Test Stand 328, including the deluge and supporting facility connections with exception of any hydrazine connections.
- Both the fuel and oxidizer dump systems.
- Building 322 battery building.
- Bunker 2 controls and instrumentation systems that support Test Stand 328.

2.1.6. Environmental Program Operations

The WSTF environmental program would manage the Test Stand 302 pond closure requirements. This would include the draining, assessment, and demolition of the 302 pond (liner to ground level) which would be performed in coordination with the overall demolition project. Additionally, the complete removal of the 302 pond leak detection system would be completed. All 302 pond closure procedures would be performed as required by provisions within the RCRA Hazardous Waste Permit and Discharge Permit DP-697 as issued by the New Mexico Environment Department's Hazardous Waste Bureau and Groundwater Quality Bureau, respectively.

All phases of this project may generate miscellaneous waste materials, including potentially hazardous wastes that would be managed, stored, and transported for disposal as needed. These various waste streams may include: propellant wastes, asbestos, lead based paint, contaminated debris, mercury articles, and batteries. At the same time, this project is expected to provide numerous recycling opportunities, primarily with scrap metal from demolition activities. All disposals of materials and/or scrap metal would be processed in accordance with applicable WSTF, state, and/or federal requirements. Scrap value of disposed material would be estimated during the design phase and managed as a recycling opportunity that would provide potential cost recovery for future sustainability activities.

Finally, all compliance and documentation requirements specific to the demolition of contributing properties within an historic district would be managed by the WSTF Cultural Resources Manager. These activities are expected to include consultation efforts, generation of a memorandum of agreement regarding mitigation efforts, and recordation work to document the area before demolition.

2.2. No-Action Alternative

The no-action alternative leaves all structures and equipment in-place with associated maintenance and operational costs for the non-active facilities. Additionally, the no-action alternative does not follow the recommendations and strategy of the facility master planning effort, the RPT recommendations, and the "reduce the footprint" mandates.

3. Affected Environment and Environmental Consequences

NEPA requires focused analysis of the areas and resources potentially affected by an action or alternative. The results of the analysis should be presented in a comparative fashion that allows decision makers and the public to see the differences among the alternatives.

The CEQ (Council on Environmental Quality) regulations for implementing NEPA (40 CFR Parts 1500-1508) also require the discussion of impacts in proportion to their significance, with only enough discussion of non-significant issues to show why more study is not warranted. The analysis in this EA considers the current conditions of the affected environment and compares those to conditions that might occur should WSTF implement any alternatives including the no-action alternative.

3.1. Affected Environment

The affected environment for this EA includes the footprint of the 300 Area altitude test facility as shown in Figure 6.

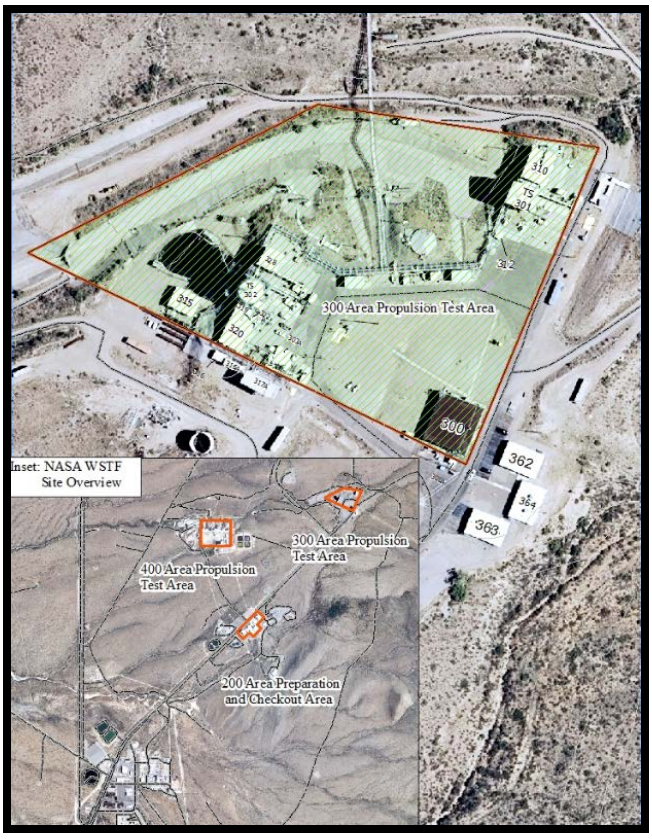

Figure 6 – 300 Area Industrial Footprint

This area is primarily industrial but is surrounded by the desert environment outside the highly developed test area. This location serves as the baseline against which the alternatives are evaluated. Only environmental resources that may be impacted by the alternatives are analyzed in detail. A complete description of all other WSTF resource areas is available in the 2015 White Sands Test Facility (WSTF) Environmental Resources Document (ERD).

Table 3.1 presents the results of the process of identifying resources to be analyzed in this EA. This assessment evaluates potential impacts to land use, geology and soils, surface water, climate and greenhouse gases, air quality, energy, biological resources, noise, and socioeconomics. Other resources were assessed but warrant no further examination in this EA.

3.2. Land Use

Current land use for the propulsion test area is highly disturbed built-up industrial operations. The land adjacent to the industrial area remains as natural desert vegetation with some industrial infrastructure in certain nearby locations (oxidizer burners, storage tanks, etc.). The current land use would not be affected by this project. All industrial areas would remain industrial use while the natural desert landscape surrounding the 300 Area would not be affected.

3.3. Topography

The current topography of the area is industrial facilities built within the normal features of a desert landscape. This includes industrial support facilities and tall test stand facilities adjacent to native desert landscape. This area is at the bottom of the western downslope of the local San Andreas Mountains. As such, overall terrain is relatively flat with some small rolling hills intersected by natural arroyos that direct surface water during rainfall events.

The project would have no impact on the overall topography of the area since the adjacent desert areas would not be impacted in any manner. The impacts of this project are localized to the highly disturbed industrial areas only.

3.4. Geology and Soils

The area topography consists of relatively flat plains west of the San Andres Mountains. The area soils are primarily the loamy soils of the Nickel-Tencee association (United States Department of Agriculture, Soil Conservation Service, 1976). The Nickel-Tencee soils tend to have gravelly fine sand to gravelly loam containing equal parts sand and silt with very little clay soil. Nickel-Tencee soils are typically related with alluvial fan deposits. These soils are moderately alkaline and permeability is moderate but slow (Seager, 1981 and Seager et al., 1987).

The project would have no impact on the local geology or soils since all activities are specific to the highly disturbed industrial areas of the propulsion test area. The adjacent area around the facility is natural desert landscape and there is the potential for very minor impacts due to the movement of construction vehicles around the construction area. These impacts are expected to be temporary and would not impact the overall geology or soil in any appreciable manner.

3.5. Climate and Greenhouse Gases

Located in the northern portion of the Chihuahuan Desert, WSTF has an arid to semi-arid climate with abundant sunshine, relatively low humidity, modest rainfall, and a relatively mild winter season typical of low latitude arid areas. Rainfall through the year is light and

insufficient for any growth except desert vegetation. The average annual rainfall at WSTF is around 10 inches (in; 25 centimeters (cm)), with the most occurring in July and August. However, it varies across site with highest amounts on or near the mountains. Temperatures at WSTF are generally warm in the summer and mild during the winter. Temperatures during the day are often near 90 to 100 °F (32 to 38 °C) for the summer months. Mild daytime temperatures characterize winter, rising to 55 to 60 °F (12.8 to 15.6 °C) on average. The lowest temperatures occur in December and January, and night-time temperatures often drop below freezing (NASA, 2015).

Seasonal wind variations in the area are significant, with the strongest sustained winds occurring in late winter and spring months. This is primarily due to the surface winds colliding with the strong westerly winds and the natural terrain of the area. In the summer months, the surface winds are lighter except for the short-term variations caused by the thunderstorms and "dust devils." Updrafts and downdrafts are always present with thunderstorms, adding to the surface wind variability by cooling the mountains and basins. Variability caused by frontal activity is generally confined to the winter and spring months, contributing to the stronger winds observed during these months. The winds may reach velocities as high as 30 to 40 miles per hour (mph) (48 to 64 kilometers per hour (kph)) or may exceed these velocities when a pressure gradient and a thermal gradient lie in the same direction.

GHG (Greenhouse gas) contributions consider direct and indirect emissions such as carbon dioxide. WSTF is not a major source of carbon dioxide emissions. Approximately half of the overall GHG contributions at WSTF are indirect from electricity purchased from the local electrical utility company. NASA uses calendar year 2011 as a conservative baseline for GHG emissions, since 2011 was the last year Space Shuttle activities were conducted at nearby WSTF and recent testing has not reached the same GHG levels as 2011 (NASA, 2015).

The project is a short-duration demolition and construction effort that would reduce operations within the 300 Area but generally relocate those operations to the 400 Area. New construction, if implemented, may result in more efficient facilities which would have a small positive affect on greenhouse gas emissions due to reduced energy use. However, this is expected to be a nominal benefit, therefore the overall project would not have any significant long-term impact, either positive or negative, on climate or greenhouse gases.

3.6. Air Quality

The U.S. EPA (Environmental Protection Agency) regulates air quality through NAAQS (National Ambient Air Quality Standards). Air quality is assessed according to six criteria pollutants: carbon monoxide, ground level ozone, nitrogen oxides, sulfur dioxide, particulate matter, and lead (USEPA, 2019). WSTF is in a section of Doña Ana County which is in attainment of NAAQS (NMED, 2019). However, high levels of particulate matter from natural sources (such as blowing dust storms) may occur temporarily during periods of high winds.

The State of New Mexico, in accordance with federal clean air standards, has adopted a set of air quality control regulations that apply to stationary sources of air pollution. These regulations apply to stationary sources, such as diesel generators. They do not apply to mobile sources such as trucks or aircraft.

The ambient air quality and weather conditions in the proposed area is excellent. The atmospheric visibility (or seeing) conditions are in the 50 to 100 mi (80 to 160 km) range. However, Doña Ana County, where the proposed project is located, has been designated as an Air Quality Maintenance Area for carbon monoxide and total suspended particulate matter near Anthony and Sunland Park, NM. Both locations are more than 30 miles away from the proposed location. The county itself is lightly populated and relatively pollution-free. Air

quality is sometimes negatively affected by the cities of El Paso, Texas and Juarez, Mexico.

Dust and debris from demolition activities is expected but would be mitigated using best practices within the construction industry. However, this would only be a short-duration event within a localized area. Removal of the boiler system and the cooling tower system from the 300 Area would reduce both toxic and criteria pollutant emissions but that may be a temporary situation if the boiler and cooling towers, or an equivalent system, are eventually installed within the 400 Area. In summary, there would be minor, short-duration effects to local air quality due to construction and demolition work.

3.7. Energy

The local electric utility company provides electricity to WSTF through a 69 kilovolt (kV) transmission line that runs parallel to the site's access road easement and terminates at the Apollo Substation located adjacent to the WSTF main entrance gate. The Apollo Substation provides power to WSTF. Industrial operations within the 300 Area require a lot of power to operate, especially when running the various altitude testing operations. Energy savings is expected because of this project, primarily due to the removal of real property square footage that requires cooling and heating operations in certain areas. Additionally, the project plans to potentially upgrade existing facility structures with more efficient systems. Overall, a relatively small net positive energy savings is expected because of this project.

3.8. Biological Resources

The primary project area is developed and highly industrial. However, biological resources are located near the 300 Area. Major vegetation near the area includes a combination of woody shrubs and grasses characteristic of the Chihuahuan Desert Scrub Biotic Community. The proposed project's location is near a xeric, poorly drained, and vegetative homogenous area. Shrubs provide a microhabitat for warm season grasses and various mammals, birds, amphibians, and reptiles.

Within close proximity to the project area are the vegetation group that contains yucca (Yucca spp.), broom snakeweed (Gutierrezia sarothrae), and honey mesquite (Prosopis glanulosa). Other plant species include tarbush (Flourensia cernua), creosotebush (Larrea tridentata), Russian thistle (Salsola kali), fourwing saltbush (Atriplex canescens), silverleaf nightshade (Solanum eleagnifolium), desert globemallow (Sphaeralcea ambigua), plains pricklypear (Opuntia polyacantha), and the desert Christmas cactus (Cylindropuntia leptocaulis). The most abundant species of grasses around the 300 Area are sand dropseed (Sporobolus cryptandrus), blue grama (Bouteloua gracilis), bush muhly (Muhlenbergia porter), and bristlegrass (Setaria sp.).

Demolition and construction activities would take place within established industrial areas with extensive human activity. However, it is possible that the project activities could inadvertently impact the surrounding non-industrial area due to equipment movement, demolition material storage, and general spillover of activities. These temporary impacts would be very minor, so there would be no long-term impacts to the site's vegetation.

Common species of birds that could occur at or near the proposed area include quail (Family Odontophoridae), roadrunners (Geococcyx californianus), doves, hawks, owls, ravens, turkey vultures (Cathartes aura), sparrows, wrens, flycatchers, and a variety of other songbirds. Migratory bird species frequent WSTF during the spring and fall. This is when the bird population is at its largest.

Common large and small mammals that are expected to occur at or near the proposed project

location include mule deer (Odocoileus hemionus), coyote (Canis latrans), raccoons (Procyon lotor), black-tailed jackrabbit (Lepus californicus), desert cottontail (Sylvilagus audubonii), woodrats, and mice.

The list of lizards and snakes includes whiptails (Aspidoscelis sp.), collared lizards (Crotaphytus collaris), coachwhips (Masticophis flagellum), gopher snakes (Pituophis catenifer), prairie rattlesnakes (Crotalus viridis), and western diamondback rattlesnakes (Crotalus atrox). Amphibian species found in this area include true toads (Bufo sp.) and spadefoot toads (Spea and Scaphiopus sp.) (Sullivan & Houde-Nethers, 1996; Skarsgard, 2011). There are no habitats that contain fish in the proposed project area.

Fauna could be temporarily affected by general demolition and construction activities, and the operation of vehicles, cranes, and other support vehicles. Noise from sources such as vehicles, heavy machinery, and general human activities related to construction and demolition activities would lead to species-specific faunal reactions. Factors influencing faunal responses may be time and length of the noise, seasonality, time of day, stress and physiological effects, life history, naturally occurring and background noise, and habituation (Larkin, 1996; Brown, 2001). Most small mammals would avoid excessive noise by retreating into burrows while larger species of mammals and birds would temporarily vacate the area. Reproductive activities of some small mammals and birds may be temporarily disrupted by noise and the presence of humans while other animals may become increasingly habituated and display little modification in behavior with ongoing exposure to project activities. Overall, the proposed activities would be within or immediately adjacent to existing human disturbed areas and should have little to no impact on mammals, birds, reptiles, and amphibians.

3.9. Cultural Resources

NASA has evaluated all facilities and structures throughout the facility to determine the presence of historic properties that may be eligible for listing on the National Register. This evaluation was performed as a 50-year survey and the results indicate two historic districts relating to the 300 and 400 Area propulsion test areas and one eligible facility within the 200 Area which is known as the Laboratory Complex. The demolition and construction activities would have a significant adverse effect on historic properties within the 300 Area because this is an eligible historic district comprised of numerous contributing elements. The 400 Area may also be slightly impacted if modifications are performed in the area, but the overall impact on the 400 Area district may be minimal because the altitude testing theme is being preserved and possibly enhanced with 300 Area infrastructures.

For the 300 Area, this project would significantly alter the historic district. This historic district is a propulsion system test area that contributed to the success of the Apollo Moon landing missions by testing the Command Service Module (CSM) systems, amongst other related activities. This area also supported later spaceflight programs including the Space Shuttle Program and other government and commercial activities. The historic district consists of 11 contributing properties including a mission control center, altitude and ambient test stands, stand support buildings, fuel and oxidizer ready storage facilities, battery buildings, and a water system. This area does not have any noncontributing structures within the historic district footprint. Figure 7 indicates the surveyed structures located within the historic district.

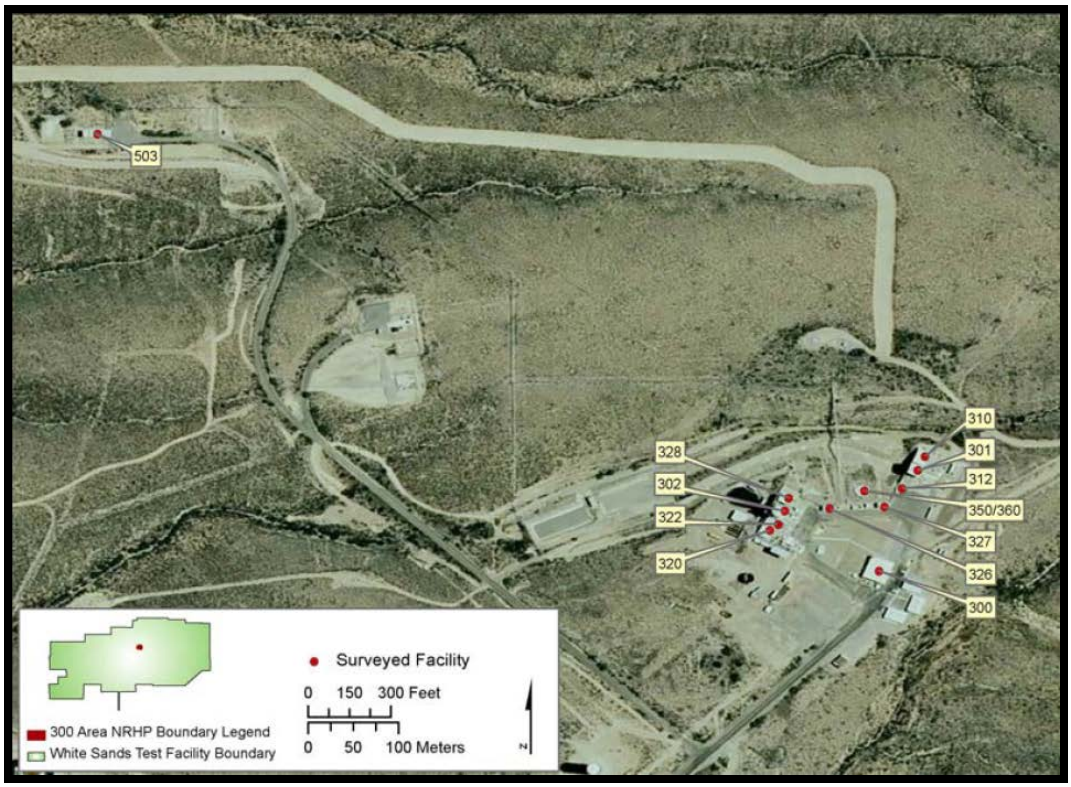

Figure 7 - Location Map of Surveyed Facilities at the 300 Propulsion Testing Area

Adverse effects include the demolition of contributing elements within the district along with modifications and renovations, and possible new construction that significantly alters the overall purpose and theme of the area. These adverse effects would be mitigated by standard consultation and mitigation procedures managed by the WSTF Cultural Resources Manager.

In addition to the historic properties within the district, there are archeological sites located in the general vicinity of the 300 Area. However, the demolition and construction activities do not pose any threat to these resources because the project area is industrial in nature and access with construction vehicles would use current roads and access points. All known archeological sites are mapped so they can be avoided during the project timeframe. Precautions such as flagging known locations and training during project planning phase would ensure that archeological resources are not impacted.

3.10. Noise

Extensive construction noise is expected during the project. Noise levels during the project may at times reach levels harmful to field personnel. For individual protection, all personnel are required to use appropriate protective hearing devices if 84 dB (A) (decibels) are surpassed. Noise impacts would be temporary, site-specific, and intermittent. These overall noise issues would also be mitigated by access limitations and buffer zone areas that maintain safe distances during demolition operations. With these personnel protective equipment requirements coupled with site-specific access limitations and short-duration events, the overall project work would have no significant impact on overall noise levels.

3.11. Environmental Justice

Socioeconomics consists of the basic attributes and resources associated with the human environment especially regarding population, economic activity, and environmental justice. The socioeconomic region of impact for the proposed action includes the areas surrounding Doña Ana County.

On February 11, 1994, the President of the U.S. signed EO 12898, entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The general purposes of the EO are to: 1) focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities with the goal of achieving environmental justice; 2) foster nondiscrimination in federal programs that substantially affect human health or the environment; and 3) give minority and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment (Executive Order No. 12,898, 1994).

The EO directs federal agencies, including NASA, to develop environmental justice strategies. Further, EO 12898 requires NASA, to the greatest extent practicable and permitted by law, to make the achievement of environmental justice part of NASA's mission. Disproportionately high adverse human health or environmental effects on minority or low-income populations must be identified and addressed. In response, NASA established an agency-wide strategy, which, in addition to the requirements set forth in the EO, seeks to: 1) minimize administrative burdens; 2) focus on public outreach and involvement; 3) encourage implementation plans tailored to the specific situation at each Space Center; 4) make each Center responsible for developing its own Environmental Justice Plan; and 5) consider both normal operations and accidents. NASA has developed a plan so that WSTF complies with the EO and NASA's agency-wide strategy.

Based on the information from the U.S. Census Bureau (USCB, 2018), minority and low-income populations exist within the proposed action's region of influence. Statistics for minority populations in nearby Las Cruces, New Mexico indicate an average of 58.6% Hispanic. Caucasians who are not Hispanic were 34.9% of the population. Approximately 5.8% of the population is an ethnicity other than Hispanic or Caucasian. The population in poverty within the region of influence averages 24.4% (UCSB, 2018). The general minority population in the State of New Mexico averages 49.1% Hispanic of any race, 15.5% population other minority groups, and 37.1% Caucasians who are not Hispanic. The statewide population has 19.5% of the population living in poverty (USCB, 2018).

Minority and low-income populations exist within the proposed action's overall region of influence. Cities, towns, and block groups within the region of influence were not considered to have high minority and poverty populations compared to the general population of Doña Ana County and New Mexico. Under the proposed action, there would be no significant impact on, nor a potential for, disproportionately high impacts and adverse effects on minority and low-income populations.

3.12. Cumulative Effects

Cumulative impacts are those environmental impacts that result from the incremental effects of the proposed action when compounded by other past, present, or reasonably foreseeable future actions (40 CFR §1508.7, 2012).

There are no major cumulative impacts identified for this project. Most areas of evaluation have little, if any, adverse effect and cumulatively they would not rise to an overall area of concern. Areas of analysis for this project, with the exception of cultural resource impacts, would be of no significance to warrant further review. During all project activities, the project is expected to generate some hazardous materials and potentially hazardous waste, but those requirements would be addressed with standard procedures that meet state and federal requirements, so cumulative effects would not be affected even with this additional project element. Additionally, beneficial aspects of the project would factor into this determination. These positive aspects may include some very minor greenhouse gas reductions, energy efficiencies, and recycling and reuse of materials that are obtained during each phase of the project. In summary, there are no overall cumulative effects expected with respect to this project.

3.13. No Action Alternative

There would be no significant negative impacts realized with the no action alternative. The 300 Area would maintain both altitude and ambient testing capabilities and the inactive facilities would continue to be minimally maintained. Additionally, the demolition of contributing properties within an historic district would be avoided. The positive effects of a reduced real property footprint that results in less maintenance costs and energy requirements would not be realized.

4. Mitigation and Monitoring

To minimize potential environmental impacts with the proposed action, the following mitigations and monitoring would be implemented during all phases of the project, where applicable. These mitigations are central to the determination of no significant impact. Any unexpected adverse impacts to the environment would be evaluated, if needed, and require additional mitigation and monitoring measures.

4.1. Air Quality

The proposed project is essentially a large-scale demolition and construction project which would extensively use vehicles and equipment including large trucks, trailers, construction equipment, and lifting devices (cranes). The primary result of this activity would be dust from vehicle traffic and demolition debris. Water trucks and dust suppressants would be used to reduce impacts. Additionally, some hazardous materials such as lead based paint and asbestos containing materials may be present. The project would employ industry standard mitigations and best practices for these hazards such as encapsulation, containment systems, and proper management and storage during all hazardous remediation efforts.

4.2. Noise

Noise levels during demolition and construction activities may, at times, reach levels harmful to field personnel. For individual protection and hazard mitigation measures, all personnel are required to use appropriate protective hearing devices if 84 dB(A) are surpassed. Additionally, work area exclusion zones would be used as mitigation in certain areas which would limit access to only authorized personnel during period of high noise activity. Training would also be provided to all project personnel.

4.3. Cultural Resources

Significant adverse effects to cultural resources are expected because of this project. Several contributing properties to an historic district would be impacted and the overall context of the

historic district would be affected. Mitigation efforts to address these adverse effects would include Section 106 interactions and consultation with the NM Historic Preservation Division, the Advisory Council on Historic Preservation (ACHP), tribal entities, and the public. A Memorandum of Agreement (MOA) that details the mitigation efforts would be completed and agreed to between all parties. The MOA would describe the documentation efforts to preserve the history of the facility which would include detailed research, archival photography, and public availability of historical records, descriptions of activities within the district, and the archival photographs. All cultural resources mitigation and monitoring actions would be overseen by a specially training WSTF Cultural Resources Manager.

For archeological sites that are in the general vicinity of the project, the WSTF Cultural Resources Manager would document and flag any locations, if needed, and provide training to project personnel to ensure that known sites would be avoided. Training would also provide direction in the event an unexpected archeological resource is uncovered during any project activities.

4.4. Hazardous Materials and Hazardous Waste

The project may be required to manage various hazardous materials and potentially hazardous waste. Mitigation measures would include routine oversight of hazardous materials and waste management activities including evaluating and profiling generated waste streams, managing containers and labeling, and overseeing the storage and final disposal procedures. Any unplanned release of hazardous constituents would be immediately contained and addressed in accordance with current WSTF procedures to minimize adverse impacts to the environment.

5. Agencies and Individuals Consulted

Antonette Doherty
Cultural Resources Manager
Environmental Office (RE)
NASA White Sands Test Facility

Amanda Skarsgard
Natural Resources Manager
Environmental Office (RE)
NASA White Sands Test Facility

Tom Nicklaus
Project Manager
Energy Manager
Facilities Engineering Office (RC)
NASA White Sands Test Facility

Timothy J. Davis, Chief
Environmental Office (RE)
NASA White Sands Test Facility
Primary Author

6. References

Brown, Lex. (2001). Overview of Research on the Effects of Noise on Wildlife. Conference Effects of Noise on Wildlife Conference. Conference Proceedings Happy Valley-Goose Bay, Labrador.

August 22-23, 2000 No2. Institute for Environmental Monitoring and Research.

Cumulative Impact, 40 C.F.R. § 1508.7 (2012).

Policy on Environmental Quality and Control, 14 C.F.R. § 1216.1 (2012).

Procedures for Implementing the National Environmental Policy Act, 14 C.F.R. § 1216.3 (2012).

Exec. Order No. 13834 (2018, May).

Larkin, R. P. (1996). Effects of Military Noise on Wildlife: A Literature Review. Center for Wildlife Ecology, Illinois Natural History Survey. Champaign, IL.

NASA Johnson Space Center White Sands Test Facility. (2015, April). Environmental Resources Document, RD-WSTF-025. Las Cruces, NM.

National Environmental Policy Act, 42 U.S.C. §§ 4321-4370d (1970).

New Mexico Environment Department (NMED). (2019). Air Quality Bureau. Retrieved from: https://www.env.nm.gov/air-quality/

Seager, W. R. (1981). Geology of the Organ Mountains and Southern San Andres Mountains, New Mexico, Memoir 36. Albuquerque, NM: New Mexico Bureau of Mines and Mineral Resources.

Seager, W. R., Hawley, J. W., Kottlowski, F. E., & Kelley, S. A. (1987). Geology of the east half of Las Cruces and northeast El Paso. Albuquerque, NM: New Mexico Bureau of Mines and Mineral Resources.

U.S. Census Bureau (USCB). (2018). New Mexico; Doña Ana County QuickFacts. Retrieved from: http://www.census.gov/

United States Department of Agriculture (USDA) Soil Conservation Service. (1976). Soil Survey of White Sands Missile Range, New Mexico; Parts of Doña Ana, Lincoln, Otero, Sierra, and Socorro Counties, National Cooperative Soil Survey. White Sands Missile Range, NM: White Sands Missile Range.

USEPA. (2019, March). Criteria Air Pollutants. Retrieved from: https://www.epa.gov/criteria-air-pollutants

Appendix List

Appendix A – Resources Considered

Appendix B – Acronyms and Abbreviations

Appendix C – Public Comments

Appendix A – Resources Considered

Resource	Analyzed for this EA?	If Yes, EA Section If No, rationale for elimination
Land Resources		
Land Use	Yes	Section 3.2
Topography	Yes	Section 3.3
Geology and Soils	Yes	Section 3.4
Water Resources		
Surface Water	No	No surface water bodies in, or around, the project location
Groundwater	No	No additional groundwater usage or impacts to existing resources
Wetlands	No	No wetlands present in project area
Stormwater	No	No stormwater issues
Floodplains	No	No floodplains present
Climate and Greenhouse Gases	Yes	Section 3.5
Air Quality	Yes	Section 3.6
Energy	Yes	Section 3.7
Noise	Yes	Section 3.10
Hazardous Materials and Hazardous Waste Management	Yes	Section 3.12
Biological Resources		
Vegetation	Yes	Section 3.8
Wildlife and Migratory Birds	Yes	Section 3.8
Threatened and Endangered Species	Yes	Section 3.8
Fish	No	No fish present at WSTF
Social, Economic, and Other Resources		
Health and Safety	No	Standard health and safety protocols for construction or demolition project
Transportation	No	No added transportation needs for WSTF 300 Area employees
Cultural Resources	Yes	Section 3.9
Environmental Justice	Yes	Section 3.11
Population	No	Not expecting any new permanent employees for action
Employment and Income	No	Minor short-term impacts during construction only

Appendix B - Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
°C	Celsius
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	Centimeter
COPV	Composite Overwrap Pressure Vessel
CSM	Command Service Module
dB(A)	Decibels (A-Weighted)
EA	Environmental Assessment
EO	Executive Order
ERD	Environmental Resources Document
°F	Fahrenheit
GHG	Greenhouse Gas
HPD	Historic Preservation Division
HVAC	Heating, Ventilation, and Air Conditioning
JSC	Johnson Space Center
km	Kilometer
kph	Kilometers per Hour
kv	Kilovolt
mph	Miles Per Hour
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standard
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NM	New Mexico
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
RPT	Rocket Propulsion Test
US	United States
U.S.C.	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
WSMR	White Sands Missile Range
WSTF	White Sands Test Facility

Appendix C – Public Comments

Public Comments with Final Disposition	
Comment	Disposition
None Received	Not Applicable