



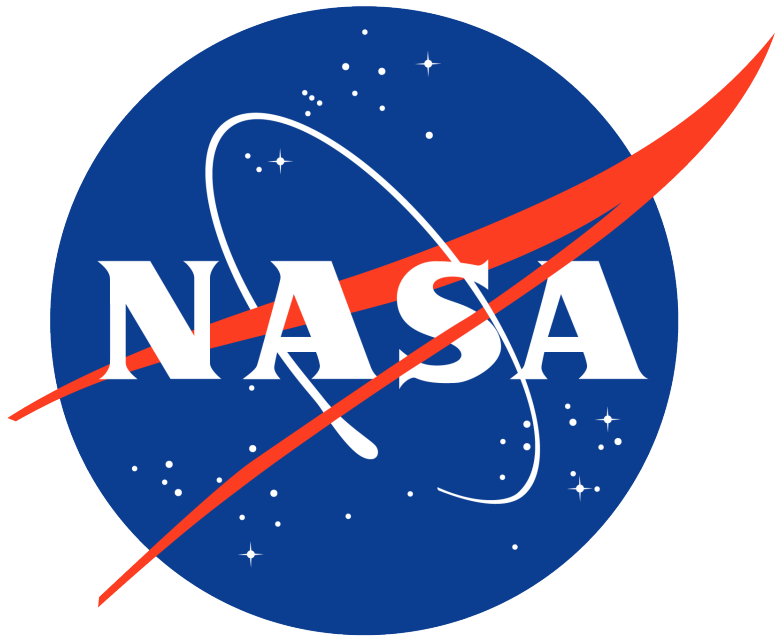
Where Safety & Testing Fuse

White Sands Test Facility (WSTF) is located in the beautiful southwest desert of Las Cruces, NM. At the base of the Organ Mountains, WSTF personnel, in addition to hazardous testing and operations, have a variety of environmental safety concerns from extreme heat, high winds, lightning, cold, and wandering wildlife. This presentation will describe how our site handles and eliminates these safety concerns.

Las Cruces, New Mexico

NASA JSC

White Sands Test Facility



Keystone Committee

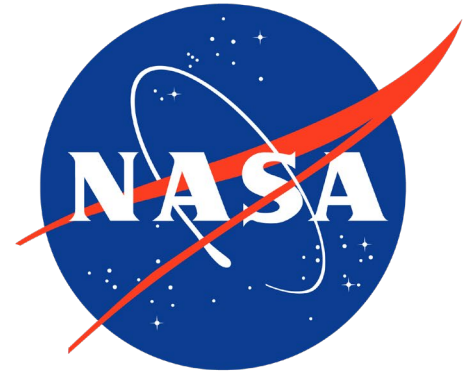
- This presentation will be given by members of the WSTF Keystone Committee.
- The Keystone Committee is an employee-based committee from many different departments who receive and assist in resolving safety, health, or environmental issues recognized and brought forward at an employee level.

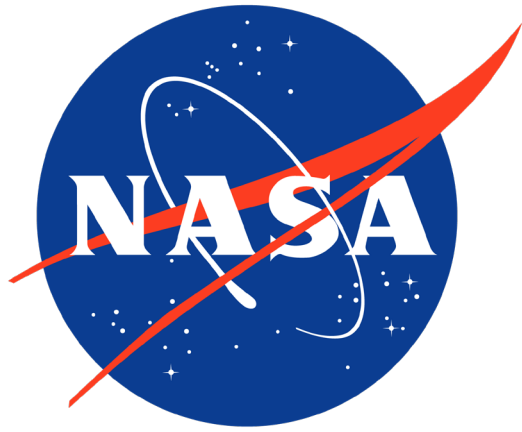
WSTF Overview

WSTF is remotely located at the southwest corner of White Sands Missile Range.

The site was established in 1963 to support the Apollo Project, including both the service and lunar modules.

On our 28-square mile site, our hazardous testing includes high pressure, high velocity, and spaceflight propulsion systems.





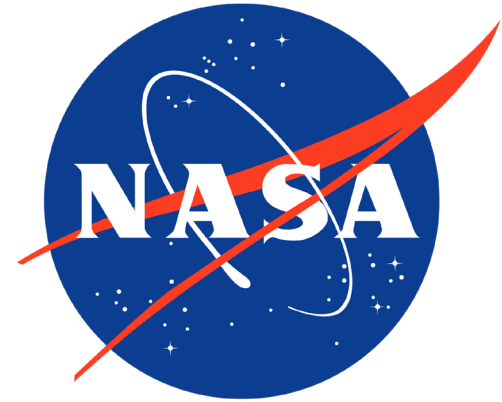
WSTF Overview/Propulsion

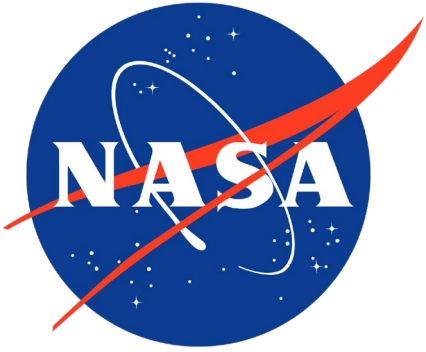


- WSTF has six test stands onsite that can test various propulsion systems.
- All tests are considered hazardous and all types of weather conditions throughout the year can create additional safety concerns for personnel and testing.

WSTF Overview/Hypervelocity

- Our site's hypervelocity facility has four two-stage light gas guns capable of firing four caliber sizes of projectiles (.17 to 1-in.)
- https://youtu.be/oMPiDZonsoA?si=OwVqM_95WFn9V6RW

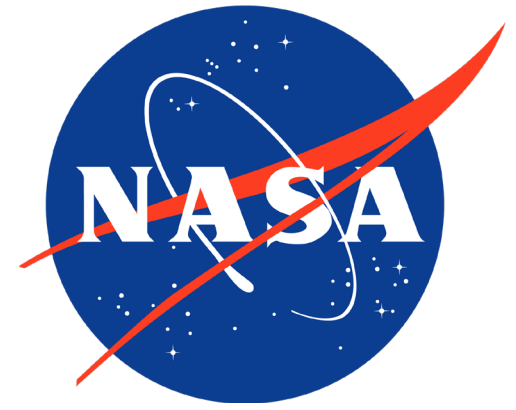




Summer Testing and Personnel Safety Concerns

- Our site requires the use of totally encapsulating suits for hazardous testing.
- Our personnel encounter dehydration concerns.
- Exposure to the sun can cause sunburn.
- This time of year brings out wildlife that can cause serious safety concerns.

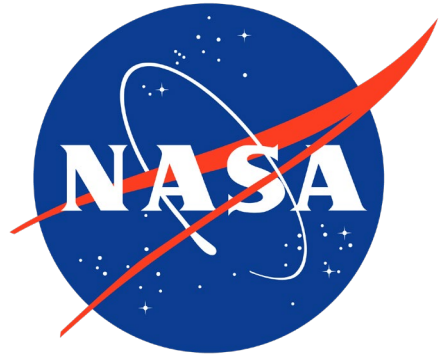
Totally Encapsulating Suits (TES)



A totally encapsulating suit is a suit that offers full body protection and provides fresh air to our personnel during hazardous operations.

- During hotter temperatures, there are certain concerns when performing hazardous work in TES.
 - No work shall be performed in the TES when the ambient temperatures are at or above 120°F.
 - When temperatures reach 100°F, limit the duration in which personnel can perform work to an hour with a 15 min break.
- Personnel are fully trained in the use of these suits and recognize the safety concerns when high heat is present (i.e., fatigue, dehydration, and confusion).
- Personnel are fully aware that they have the right to not enter the suit if they feel that heat conditions are too much for them to perform their work effectively and safely.



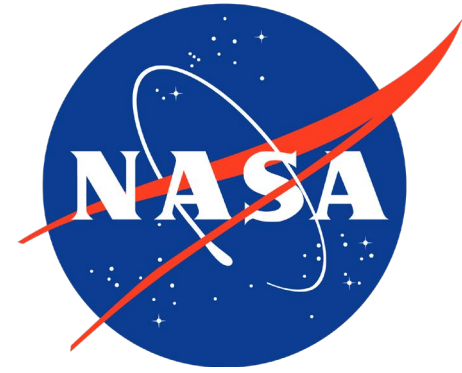


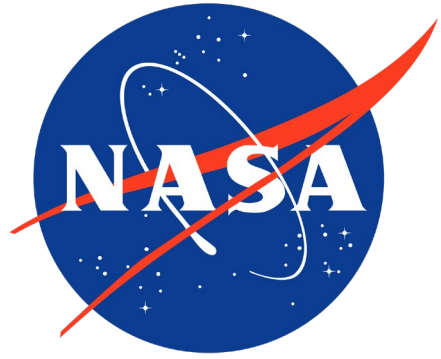
Dehydration

- Living in the southwest, dehydration is a real and common safety concern.
- We have numerous projects that occur in areas where you may be exposed to environmental conditions that can dehydrate an individual very quickly.
- Understanding the early stages of dehydration is key.
 - Fatigue
 - Headaches
 - Lack of urination
 - Lack of perspiration
 - Muscle cramps
- These concerns are lessened by limiting the work being performed in the heat.
- Supply personnel access to water such as personal hydration packs while on the job site.
- In 2023, Las Cruces had a record-breaking 52 days in the 100°F range.
- Starting in May, we start to experience consistent weather in the 90°F range.
- Starting in June, we start to see triple digit temperatures.
- These high temperatures typically last through September.

Sun Exposure

- Although often overlooked, exposure to the sun is a real safety concern.
- New Mexico is in the top ten states with the highest UV index.
- Sunburns can occur and not be noticed until it is too late.
- These exposures are limited by wearing clothing that breathes but also covers our extremities.
 - Long sleeve shirts
 - Hard hats with neck protection
 - Darker lensed safety glasses
- The application and reapplication of sunblock is highly recommended and encouraged.



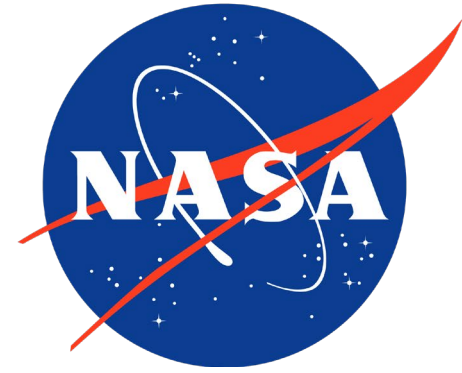


Wildlife, Reptiles, Arachnids

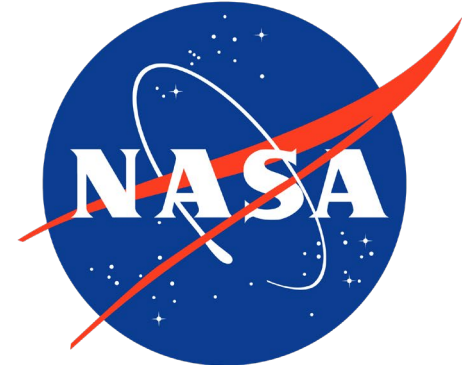
- During this time of year, our wildlife, reptiles, and arachnids become more active. This activity invites safety concerns that need to be revisited for the site.
- Our wildlife roams freely on site and at times will cause road hazards.
- Wildlife to look out for includes, but is not limited to, the following.
 - Oryx
 - Rattlesnakes
 - Deer
 - Javelina
 - Arachnids (Eight-legged Freaks)
- Out of these five, the three most commonly seen on site will be discussed.

Oryx

- These animals are the largest of the antelope family. They stand 4 ft to the shoulder and range from 75 to 94 in. in length. Although varied based on gender, they have an average weight of 500 lbs.
- These beautiful animals roam freely on range and have adapted to our presence.
- Many times, they can be found on the side or in the middle of the road.
- They will cause significant damage to vehicles if struck.
- It is important to make personnel aware that although these animals are beautiful, they are not there to be photographed or approached.
- They always have the right of way.



Rattlesnakes

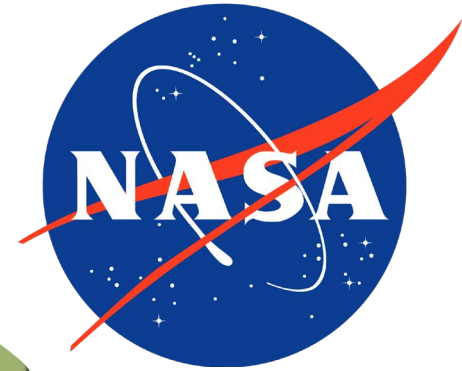


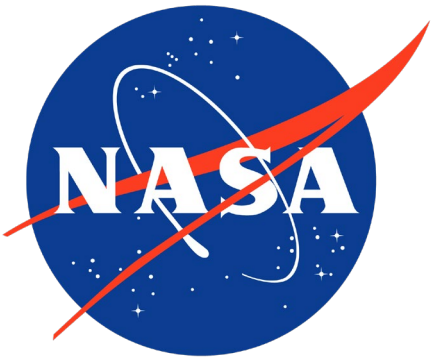
- These slithery friends are abundant and a real safety concern for our personnel during this time of year.
- They prefer temperatures from 80 to 90°F.
- They make their way into buildings and at times are found in testing areas, so being visually vigilant is a must.
- They love the coverage of brush, pallets, and tubing, so working out in the field can add to the safety concerns of working in this environment.
- When one is found, our site is instructed to call our onsite fire department so they can capture and relocate the reptile.
- If you are bitten, we have safety protocols onsite that will get you medical attention right away.
- They are faster than you so don't be fooled. They can cover half their body length in just 70 milliseconds and can reach 8 ft in length.



Eight-legged Freaks

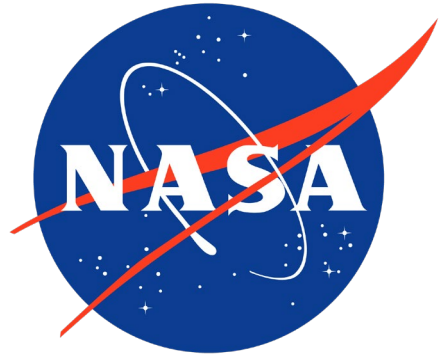
- Many venomous spiders can be found on site, but two of the more common ones are detailed below.
- Black Widow Spider
 - They can typically produce 4-9 egg sacs in the summer.
 - They tend to hang out in dark and undisturbed areas such as wood piles, shrubs, behind furniture, and under desks.
 - Symptoms from a bite include muscle and chest pain, cramping, nausea, breathing and speech difficulty, and sweating.
- Brown Recluse
 - They prefer dark, dry areas.
 - They lay eggs during the summer.
 - They like to hide in human-altered environments, trash cans, and tarps.
 - Symptoms from a bite include muscle and abdominal pain and skin beginning to peel off.
- Our site has pest control mitigation to limit interaction with these nasty critters.





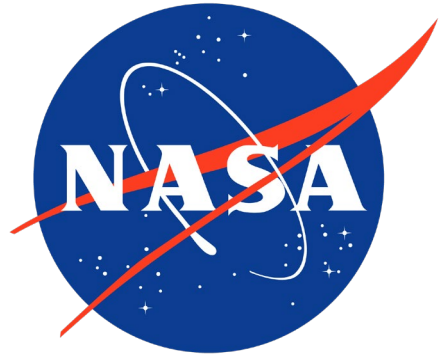
Winds

- Our location experiences high winds that affect our testing abilities and onsite work.
- Placement of barricades for hazardous testing (engine firing, propellant operations, and purging of test stands) is required.
- Wind directions and wind speeds need to be monitored for the duration of the operation.
- Areas downwind of hazardous operations need to have restricted access.
- High winds may result in operation stoppage and evacuation of areas.
- It affects onsite work and limits access to roofs, towers, and the use of ladders.
- Items in the field may become flying objects.



Lightning

- **Lightning is possible throughout the year and needs to be monitored when present.**
- White Sands Test Facility has above-ground magazines, storage vessels, and buildings that need to be grounded.
- Lightning within 6 miles is cause for work and operation stoppage.
- Work and operations stopped due to lightning may resume no earlier than 30 min after the last lightning strike 6 or more miles away.



Cold

- Cold weather in our location causes hazardous conditions that affect onsite operation and field work.
- Hazardous areas have cold weather protocols that must be followed. To ensure test area systems or propellant storage areas aren't leaking due to component/flange seals contracting.
- Weather conditions are monitored daily.
- If temperatures fall below 25°F, hazardous areas must be placed under restricted access.
- Totally encapsulating suit (TES) use is limited to 40°F and shall not be used if the temperature is 20°F.
- TES stiffen when temperatures fall below 40°F.
- Wind speed needs to be considered when using TES due to wind chill.
- Hazardous road and walking conditions can become an issue due to freezing.



Questions?

Learn more about the White Sands Test Facility

<https://www.nasa.gov/white-sands-test-facility/>

Las Cruces, New Mexico

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