2021 YEAR in REVIEW

NASA SANTA SUSANA FIELD LABORATORY

NASA administers 451.2 acres in two areas of the Santa Susana Field Laboratory (SSFL) used historically for the research, development, and testing of rocket engines associated with programs such as Apollo and the Space Shuttle. This Year in Review is intended to present highlights from the work accomplished at SSFL over the past year as NASA continues to work toward achieving a cleanup that is fully protective of public health and the natural environment.

GROUNDWATER & SOILS

2021 was a year of progress with groundwater cleanup efforts at SSFL. In May, active groundwater treatment resumed with the re-activation of the onsite groundwater extraction and treatment system (GETS). The GETS treats groundwater extracted from 13 wells across SSFL as part of a groundwater interim action (GWIM) overseen by the Department of Toxic Substances Control (DTSC).

NASA also prepared for the implementation of two groundwater pilot studies set to launch in 2022. Consistent with NASA's Green Engineering Initiative, both pilot studies use technologies that optimize energy efficiency to conserve energy and water.

The first study will evaluate the effectiveness of enhanced in situ bioremediation (ESIB), a treatment technology that uses naturally occurring microbes to remove trichloroethylene (TCE) and other volatile organic compounds (VOCs) from groundwater. As part of the study, NASA is building a closed-loop extraction-recirculation system. In 2021 NASA completed the permitting process with the Los Angeles Regional Water Quality Control Board and drilled and developed one of the three monitoring wells required for the system. A second pilot study focuses on bedrock vapor extraction (BVE) and its ability to remove VOCs from the fractured bedrock below SSFL. During 2021, NASA designed the BVE system and prepared for its construction in early 2022.

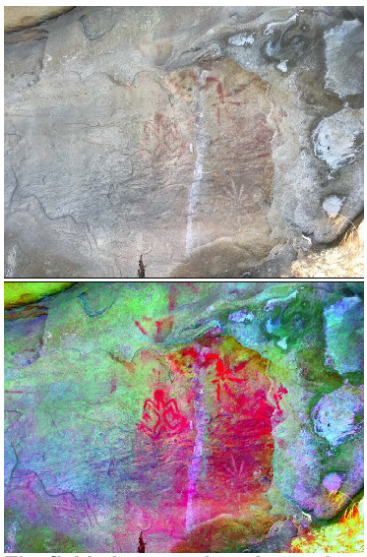
In August, NASA drilled one of three injection wells needed for the EISB pilot study.

For soils, NASA is eager to continue to make progress toward cleanup, but the DTSC must finalize their SSFL Program Environmental Impact Report (PEIR) before NASA can begin designing soil cleanup plans.

CULTURAL RESOURCES

NASA continues to demonstrate its commitment to protecting the extraordinary Native American and cultural resources located at SSFL. During 2021, NASA progressed with its Programmatic Agreement (PA) requirement to produce and submit a Traditional Cultural Property (TCP) nomination to the National Register of Historic Places (NRHP). Listing the TCP in the NRHP would ensure the documentation and recognition of the SSFL site as a landscape of central importance to the history and religious and cultural practices of Native American Tribes tied to the region. NASA submitted the nomination to the Keeper of the NRHP in September of 2020 and in early 2021, NASA responded to comments from the Keeper, and submitted an updated nomination to the California State Historic Preservation Officer (SHPO) for final review. NASA is currently waiting for the SHPO to review and provide feedback on the updated nomination so it can be resubmitted to the Keeper.

During 2021 NASA also undertook a photographic survey of rock shelters and overhangs in NASA areas at SSFL. The goal of the study was to assess the existence of unidentified pictographs utilizing DStretch photographic filters that can reveal faint or unseen rock art, and identify any previously unknown prehistoric cultural resources. Although no new rock art sites were identified, fourteen previously unidentified archaeological sites were discovered and formally recorded during this survey.



The field photograph at the top is shown with Dstretch enhancement at the bottom.

2021 YEAR in REVIEW

NASA SANTA SUSANA FIELD LABORATORY

DEMOLITION

NASA continued with its demolition program and kicked off Phase 5 in the Bravo Test Area in the summer of 2021. Phase 5 focuses on the demolition of the two remaining Bravo test stands and associated control house. NASA completed pre-demolition activities, including biological surveys and abatement of asbestos and the lead-based paint on the test stands. During demolition, NASA characterized and handled all demolition debris in accordance with all environmental requirements and safety precautions outlined by local, state, and federal regulations. Over 19 tons of non-hazardous waste and 4 tons of hazardous waste were documented and safely transported offsite for proper disposal at approved waste facilities. In addition, nearly 2,000 tons of un-impacted steel was transported for recycling in 2021.

NASA removed the three flare stacks, known as "tiki torches," at the top of Bravo Test Stand 2. These stainless-steel pipes, ranging in size from 15 linear feet to 42 linear feet, were used historically to redirect and safely burn off exhaust during rocket engine testing at Bravo. Once detached from the stand, NASA prepared the historic flare stacks for transfer to the Air Force for display at the Flight Test Museum.

A crane removes one of the three flare stacks from the top of Bravo Test Stand 2.

AIR MONITORING

During 2021, NASA continued to evaluate air quality conditions in NASA areas at SSFL as part of a site-wide air monitoring program that began in 2018. Throughout the year, NASA collected in-the-field air monitoring data with four strategically placed air monitoring stations. In addition, NASA conducted laboratory analysis of the ambient air samples, performed quality assurance activities, and produced quarterly reports and annual reports summarizing the data. Results so far have indicated there are no measurable emissions from the site negatively impacting air quality at SSFL, nor the local or regional air quality.

One of four air monitoring stations located in NASA areas.

FOR MORE INFORMATION

Visit **https://ssfl.msfc.nasa.gov** or contact:

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