

Community gets up-close look at NASA pilot studies during 'Groundwater U' site tour

Community members gathered at Santa Susana Field Laboratory (SSFL) for a site tour on April 6, the conclusion of a three-part Groundwater U public workshop series to learn more about groundwater at SSFL and prepare the public to review and comment on forthcoming groundwater decision documents.

During a tour stop at the Alfa Test Area in the NASA-administered portion of SSFL, visitors got a first-hand look at two active pilot studies NASA is conducting to clean the groundwater beneath the test area. Peter Zorba, NASA SSFL project director, described [NASA's Enhanced In Situ Bioremediation \(EISB\) pilot study](#), in which naturally occurring microbes degrade trichloroethylene (TCE) and other volatile organic compounds (VOCs) in the groundwater through a process called reductive dechlorination. Community members also had the chance to see and ask questions about NASA's [Bedrock Vapor Extraction \(BVE\) pilot study](#), a portable, solar-powered system that targets VOC vapors trapped in fractures and pore spaces in the bedrock matrix in the unsaturated vadose zone above the water table.

"We are excited about our groundwater pilot studies, and the Groundwater U tour allowed the public to see firsthand how we are actively treating groundwater and gave us the chance to show how we will expand on those efforts to begin full-scale groundwater cleanup," said Zorba.

Visitors also got an up-close look at Alfa Test Stand 3, as Zorba described how the historic rocket engine testing process worked, and how TCE and other VOCs were released as part of that process.

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-- Peter Zorba, NASA SSFL Project Director

The tour group stopped in other areas at SSFL to showcase treatment technologies that the Department of Energy (DOE) and Boeing are studying, as well as a stop at the onsite Groundwater Extraction Treatment System (GETS) that has treated millions of gallons of groundwater to date from various source areas across the SSFL site.



NASA SSFL Project Director Peter Zorba discusses how the BVE system removes VOCs from the fractured bedrock beneath SSFL.



Groundwater U tour attendees gather at Alfa Test Stand 3 in the NASA-administered Area II.

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NASA welcomes new SSFL Groundwater Project Manager



**Antonette Doherty, NASA
Regional Restoration
Program Manager**

NASA is pleased to announce the addition of Antonette Doherty to the NASA cleanup team at SSFL. Antonette will work alongside Peter Zorba, NASA SSFL Director, as a key member of the team overseeing NASA's groundwater cleanup at SSFL. Serving as Regional Restoration Program Manager within the Environmental Management Division (EMD) at NASA, Antonette's primary focus for SSFL is to provide program management and technical oversight for groundwater cleanup activities, including the Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI) documents, as well as ongoing groundwater monitoring and reporting. She will also regularly coordinate with other SSFL responsible parties and regulatory agencies and support public engagement activities at SSFL.

"I am really looking forward to working with the technical team, the federal, state, and local regulatory agencies, and the community to help move NASA's groundwater cleanup program forward at SSFL through the corrective action process and to the final remedy," said Doherty. "Ultimately, we all share the same goal of achieving a safe and effective cleanup, and I am glad to be part of the team to help get us there."

Antonette brings with her a wealth of technical experience and expertise, as well as a passion for environmental stewardship. She holds a Bachelor of Science degree in Environmental and Occupational Health and a Master of Science degree in Environmental Engineering from New Mexico State University. She joined NASA in 2016 as an Environmental Project Manager for NASA's Johnson Space Center White Sands Test Facility (WSTF) in Las Cruces, New Mexico.

At WSTF, she managed and provided technical oversight for various restoration projects, with a particular focus on RCRA corrective action sites, groundwater monitoring program management, and natural resource damage assessments. Additionally, Antonette served as the WSTF Cultural Resources Manager (CRM) and played an important role in implementing the WSTF CRM program. In addition to her role at SSFL, she continues to provide program management and technical oversight at the WSTF, overseeing the groundwater monitoring and reporting program, source area investigations, and the evaluation of remedial technologies.

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The Groundwater U workshop series was a cooperative effort between the California Department of Toxic Substances Control (DTSC), NASA, Boeing, and DOE.

The first session, entitled "What is Groundwater," was on Feb. 20 and featured a presentation by Dr. Matt Becker, professor and Conrey Endowed Chair of Hydrogeology in the Department of Earth Science and California State University Long Beach. Becker provided an overview of groundwater, geology, and hydrogeology and responded to public questions in a Q&A session following the presentation.

The second session took place on March 12 and addressed a question about where there is groundwater contamination at SSFL. During this session, Dr. John Cherry, Professor Emeritus at the University of Waterloo and Adjunct Professor at the University of Guelph, and Dr. Beth Parker, Professor of Engineering at the University of Guelph – both members of the SSFL Groundwater Advisory Panel – discussed the unique characteristics of the SSFL site and how it affects the formation and transport of contaminants.

The final workshop on April 4 featured an overview presentation by DTSC about the groundwater cleanup process, as well as presentations by DOE, NASA, and Boeing describing the groundwater treatment options that each organization has studied at SSFL, as well as interim measures and pilot studies. The workshops were preceded by a Jan. 23 listening session hosted by DTSC, where public input was sought regarding groundwater topics of interest to prepare for the Groundwater U workshops.

More information about Groundwater U, including recordings of previous workshops, can be found at [DTSC's SSFL community event's webpage.](#)

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NASA hits key milestone in groundwater cleanup process

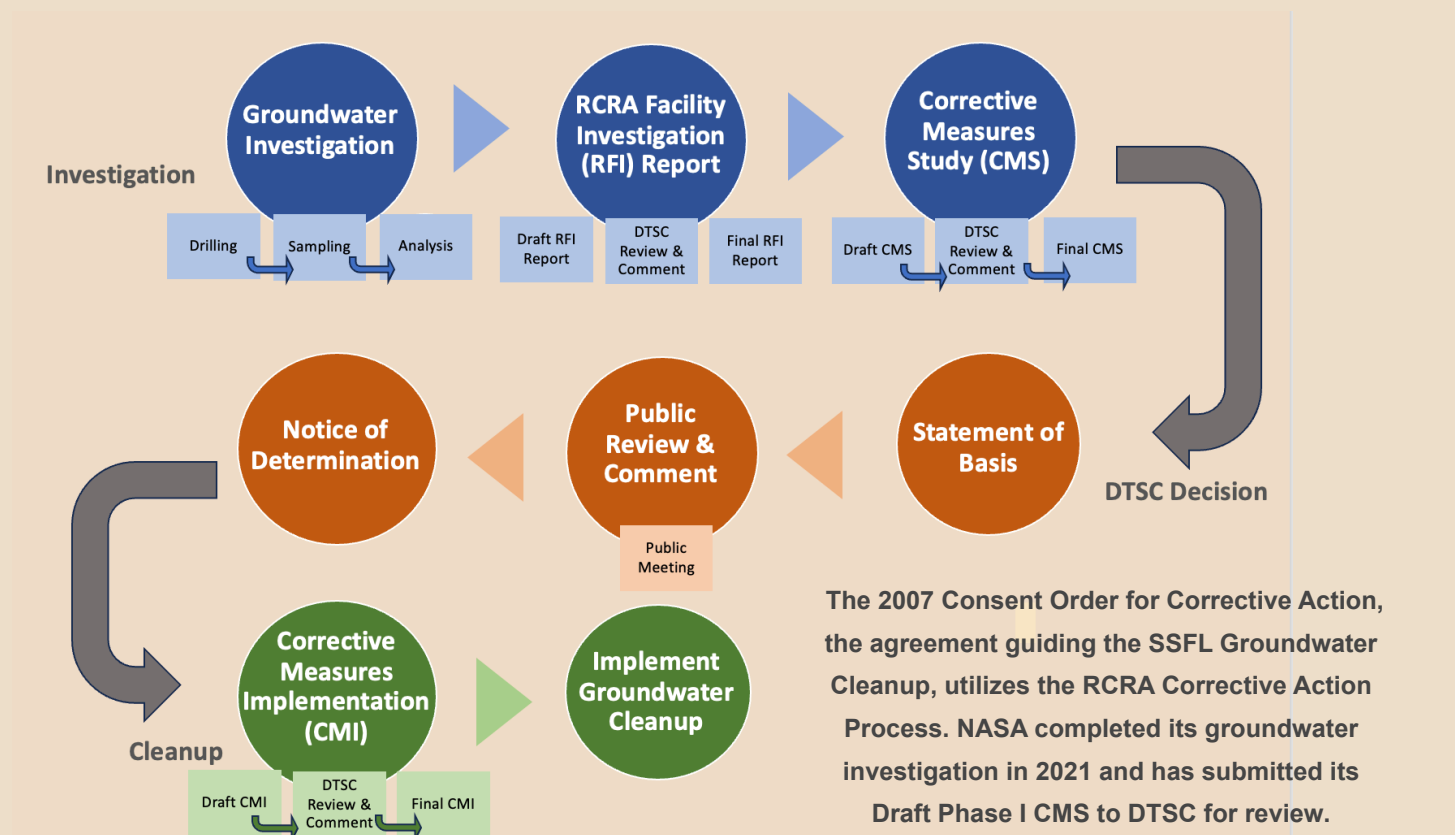
Earlier this year, NASA submitted a Draft Phase 1 Corrective Measures Study (CMS) for Groundwater to the Department of Toxic Substances Control (DTSC), bringing NASA one step closer to implementation of a comprehensive groundwater cleanup at SSFL. The CMS is a key part of the Resource Conservation and Recovery Act (RCRA) process that NASA is following throughout the investigation and cleanup process. NASA's CMS evaluates corrective actions and recommends corrective measures required to clean up groundwater in NASA areas at SSFL.

Under RCRA, DTSC (as the regulatory agency) will select a preferred remedy and issue a Statement of Basis summarizing NASA's 2021 RCRA Facilities Investigation (RFI) Report and the CMS. Community members and interested parties will have the opportunity to review and comment on the document during the public comment period. NASA is expecting DTSC to release the Statement of Basis for NASA's Phase I groundwater cleanup this summer.

Once NASA has a final, DTSC-approved Phase 1 CMS, NASA will proceed with producing a Phase 1 Corrective Measures Implementation (CMI) Plan, which provides a detailed plan for cleanup, including specific corrective measures to be taken and the timeline for implementation. Once the CMI is completed — anticipated in 2025 — NASA can begin implementing the first phase of groundwater cleanup (see diagram below that outlines the RCRA investigation and cleanup process).

NASA is approaching the cleanup in two phases, and the RCRA documents reflect this approach. The Phase 1 CMS (and subsequent CMI) addresses source areas in the groundwater and bedrock with the highest concentrations of trichloroethylene (TCE), which is NASA's primary concern for groundwater cleanup. The Phase 2 CMS (and CMI) will cover the remaining groundwater and bedrock vapor contamination.

RCRA Corrective Measures Process for SSFL Groundwater



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Coca Demolition continues as NASA moves into Phase 7



Coca Test Stand I is at the center of NASA's Phase 7 demolition.

NASA kicked off Phase 7 of its demolition program at SSFL early this year and has already made visible progress. Phase 7 includes the dismantling and removal of the Coca Test Stand I superstructure and the much smaller remnant of Coca Test Stand 2, an early version located adjacent to Stand I.

In March, following the completion of pre-demolition abatement activities, a large 300-ton crane was deployed to the Coca I site and assembled by the demolition team. The crane allows crews to reach the top of the more-than-200-foot structure and dismantle it section by section.

NASA expects to complete Phase 7 demolition by the end of this year. Phase 8 -- the last planned phase of demolition in NASA areas at SSFL prior to cleanup -- will include the removal of the Coca Control House as well as the remaining concrete in the spillways and throughout the Coca Test Area. Phase 8 is expected to begin sometime in 2025.

NASA demolition activities at SSFL are overseen by the U.S. Army Corps of Engineers (USACE). USACE has partnered with demolition contractor Per-ma-Fix to complete Phase 7 activities.

Demolition in Photos: Phase 7 - Coca I



Demolition crews attach the boom (the telescopic arm used to lift heavy objects) to the crane.



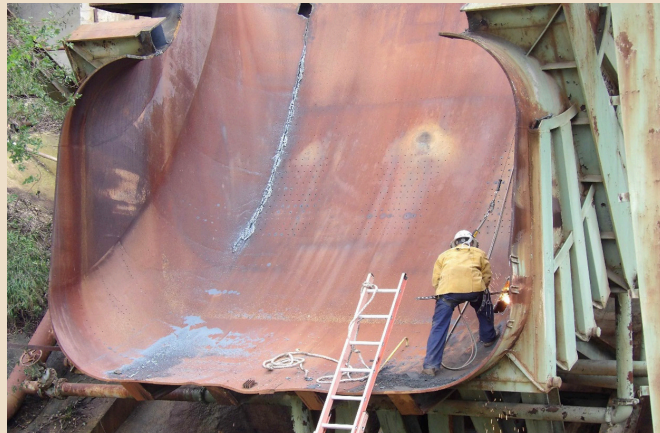
Workers look on as a crane moves an elevator car that was once used to transport workers to different levels of the test stand during historic operations.



Above: A 300-ton crane removes Level 7 of the Coca Test Stand I during demolition.



The flame stack that stood atop Coca Test Stand I sits in front of the structure following its removal.



Left: A worker uses a torch to cut the flame bucket into sections prior to removal.

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