



Summer 2023

Recently, the Department of Toxic Substances Control (DTSC) issued the final Programmatic Environmental Impact Report (PEIR) for the Santa Susana Field Laboratory. The purpose of the PEIR is to inform the public about reasonable alternatives for minimizing, avoiding or eliminating significant environmental impacts for cleanup at the site.

Our cleanup will comply with applicable state law and regulations and will ensure the protection of users of the site, surrounding communities, cultural resources and the environment. We will continue to work with DTSC to finalize the soil and groundwater reports necessary for DTSC to make its remedy decision and authorize Boeing to complete the cleanup of our areas of responsibility.

After experiencing an extremely rainy season this winter, we were able to spend early Spring making progress on one of the two Imminent and Substantial Endangerment Determination and Consent Orders (ISEs) issued last year—the former employee Shooting Range at Sage Ranch Park.

The ISE requires Boeing to clean up soil on property currently owned by the Santa Monica Mountains Conservancy that was contaminated by nonprofit shooting range activities created by Rocketdyne and Atomics-International employees.

Numerous prior cleanup activities have been performed in the area. However, additional cleanup is needed to protect some species of birds that may consume lead shot remnants and, in turn, may be eaten by other wildlife.

This is a risk-based cleanup overseen by DTSC that complies with California's rigorous standards of protection. The second ISE for cleanup of contaminated soils in the Area I Burn Pit is in planning with DTSC and is expected to start later this year.

For more information about Boeing's activities, visit www.boeing.com/santasusana.

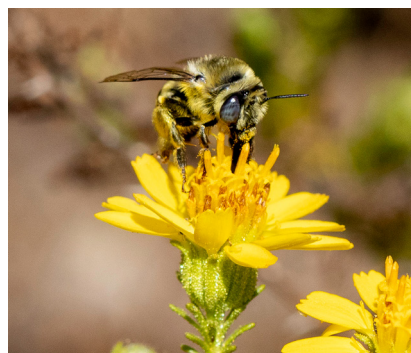


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Pollinator Partnership Blossoms with California Tarplant and Pollinator Study



Urbane Digger Bee (*Anthophora urbana*) on Santa Susana Tarplant (*Deinandra minthornii*) identified during Santa Susana Field Laboratory Pollinator Study. Photo: Zack Abbey, Padre Associates

Pollinators play an important role in our daily lives. Birds, bees, butterflies and bats provide us with one of every third bite of food we eat and they also pollinate more than 70% of all flowering plants that rely on them for reproduction. However, pollinators around the world are showing dangerous signs of decline.

Most people know the Santa Susana Field Laboratory played a significant role in the development of rocket propulsion and energy research. What most people do not know is that the site also serves as key habitat for a variety of native fauna and flora. As the site moves toward restoring areas once used for test facilities, a special focus has been placed on preserving native habitats for our wildlife and pollinators.

Boeing asked Pollinator Partnership, a nonprofit organization that encourages the health of pollinator populations throughout North America, and our onsite consulting biologists, Padre Associates, to evaluate whether the

Woolsey Fire had an impact on the germination potential of the Santa Susana tarplant (*Deinandra minthornii*), a rare California plant found throughout the site. In addition to studying seed quality, the study looked at the number and diversity of bees visiting the tarplant to determine any differences in pollination activity before and after the fire.

The post-fire seed and pollinator study began in October 2019. Biologists identified seven sites on Boeing property where tarplant, with characteristic yellow florets, is prevalent. Biologists collected more than 5,700 seeds over a period of three years and tested the quality of each seed using a tetrazolium solution. The solution is commonly used in biochemical experiments to indicate cellular respiration. The results found that the average viability of samples was almost 80% compared to the 2015 pre-fire germination study where seed viability was 65.5%.

The bee assessment during the three-year study found a few differences from pre-fire studies. Before the fire, honeybees and native bees (i.e., leafcutter and bumble bees) were equal visitors to Santa Susana tarplant. After the fire, the dynamic changed. Honeybees outnumbered native bees through the duration of the study. Additionally, the study found lower number of bees visiting the site after the fire.

Overall, the seed and pollinator study found that the Santa Susana tarplant was one of the fastest plant species to recover at the site after the fire. The tarplants' seeds were of higher quality after the fire, which the study found was due to increased pollinator visits.

Post-Woolsey Fire Study Finds No Evidence of Site Impacts in Offsite Locations



Aerial photo of the Simi Hills.

Following the Woolsey Fire, Boeing commissioned Risk Assessment Corporation (RAC) to determine if potential fire-driven airborne radionuclides had a measurable impact on neighboring communities. RAC specializes in environmental radiological risk and dose assessment, and the Company's founder, John Till, together with Helen Grogan, co-edited the standard textbook, "Radiological Risk Assessment and Environmental Analysis" in 2008.

RAC performed source term estimation, atmospheric transport and deposition modeling, and surface and subsurface soil sampling (during August 2019, nine months following the fire). They wrote a report documenting their analysis in 2020, and in early 2023, the Radiation Safety Journal of the Health Physics Society (HPS) published their peer-reviewed article, "Potential Airborne Releases and Deposition of Radionuclides from the Santa Susana Field Laboratory during the

Woolsey Fire." RAC's study concluded, "Air measurement data collected during the Woolsey Fire, along with atmospheric dispersion modeling and an offsite soil sampling program designed specifically to look for impacts from the fire, showed no evidence of SSFL impact in offsite soils because of the Woolsey Fire."

In addition, RAC determined that some assertions made by Fairewinds Energy following a community-led sampling of ash, dust and soil after the Woolsey Fire were not able to be reproduced or validated. The study can be found here:

https://racteam.com/wp-content/uploads/2023/05/Report-on-Evaluation-of-Offsite-Impacts-of-Woolsey-Fire-at-SSFL_FINALApps.pdf



STORMWATER SEASON – BY THE NUMBERS

- **45+** inches of rain
- **7** outfalls with flow
- Over 50 days operating at Stormwater Treatment System 18; more than **34,000,000** gallons treated
- Over 30 days operating at Stormwater Treatment System 11; more than **6,000,000** gallons treated
- **60+** samples taken
- **5,500** individual analyte tests analyzed
- **99%** onsite compliance

Additional information can be found in Boeing's quarterly stormwater report: https://www.boeing.com/assets/pdf/aboutus/environment/santa_susana/ents/1Q2023-DMR-1-of-6.pdf

Boeing's Bedrock Vapor Extraction Pilot Study Q & A

As a result of past rocket engine testing and energy research, chemicals seeped into the soil and groundwater at Santa Susana. The primary groundwater contaminant is trichloroethylene (TCE), a common industrial solvent. TCE was used in the early years at the lab to clean out residual fuel after rocket engine testing and degrease parts and equipment.

Groundwater investigation efforts at Santa Susana also have been conducted over several decades by Boeing, NASA and the U.S. Department of Energy (DOE). This work has been performed under the oversight of the California Department of Toxic Substances Control (DTSC). Since 1996, Boeing has received input and guidance on its groundwater investigation from the Santa Susana Groundwater Advisory Panel, which is made up of renowned groundwater experts. Under their direction, several new techniques were developed to examine the fractured bedrock and deep groundwater, and study the distribution, transport and fate of chemical contamination.

Boeing is conducting a bedrock vapor extraction pilot test in the southeast area of the site near the former Component Test Laboratory III (CTL-III) to determine if vapor extraction can remove TCE in bedrock. CTL-III was used to test gas generators and small rocket engines, among other operations.

What is vapor extraction?

Vapor extraction is a treatment technology used to remove vapor (volatile organic chemicals) in soil. It works by applying vacuum flow through the soil and fractured bedrock to extract vapors.

How will it be implemented onsite?

Onsite, the vacuum will be applied to extraction wells open to fractures and unsaturated porous bedrock and will focus in an area where high levels of TCE were found in partially saturated rock and groundwater. This field work will be conducted in collaboration with the University of Guelph Morwick G360 Groundwater Research Institute, groundwater experts who have studied the site for more than 25 years.



Crew installs bedrock vapor extraction well near the former Component Test Laboratory III.

When is the pilot test scheduled to begin?

This work is scheduled to begin in June 2023 and it will last approximately 10 months. However, drilling and installation of the vapor extraction well and five monitoring wells began in October 2022.

How will you know if vapor extraction was effective?

The criteria used to evaluate the performance of the test will include

- 1) analyzing the mass of extracted compounds through measurements of the flow rate and the concentration of the compounds, which is done through sampling,
- 2) the pressure (vacuum) and flow of the blower and,
- 3) the pressure in the adjacent vapor monitoring wells before and after shutting down the vapor extraction well.

Is drinking water impacted?

Drinking water is not affected. Groundwater below the Santa Susana site is not—

and never will be—used for public consumption. The use of groundwater for drinking water purposes is expressly prohibited in the 2017 Conservation Easement that Boeing recorded over its approximately 2,400 acres at Santa Susana, as well as the land use covenant placed on the site by DTSC in 2022 prohibiting groundwater use. In addition, after convening a hearing prompted by community concerns, the Los Angeles Regional Water Quality Control Board confirmed that the groundwater at Santa Susana is part of a different aquifer with no direct connection to the aquifer that Simi Valley had proposed to use to supplement drinking water supplies. Any contamination that may exist in the Simi Valley aquifer is from local sources and not related to Santa Susana operations.

For more information about Boeing's groundwater activities, visit https://www.boeing.com/resources/boeingdotcom/principles/environment/pdf/08.16.21_Santa%20Susana%20Groundwater_081621A.pdf.

Citizen Scientists in Action



Earth Day Nature Walk

In celebration of Earth Day, Boeing and citizen scientists from the Sky Valley Volunteers, Simi Hills Wildlife Observatory and Southwestern Herpetologists Society hosted a private nature walk, highlighting the citizen scientists' onsite biological activities.



California Scrub-Jay (*Aphelocoma californica*)

Simi Hills Wildlife Observatory

Last month, birders from the Simi Hills Wildlife Observatory hosted a bird-a-thon at Santa Susana. The bird-a-thon involved teams of birders attempting to find and identify as many species of birds as they could at the site over a four-hour period. The species count identified at the site was 38 plus two partly identified taxa. Some identified species included: Golden eagles, Canyon wren, Western tanager, Hooded oriole, Phainopepla and Lewis's woodpecker.

For more information, visit <https://simihillswildlife.wixsite.com/aboutus>.



California Kingsnake (*Lampropeltis californicae*)

Southwestern Herpetologists Society

The Southwestern Herpetologists Society had a record snake identification day in early April when they identified 16 snakes in one day, including 11 Gopher snakes, three California King snakes, one Ringed-neck snake and one Two-striped garter snake. Also ID'd that same day: Side-blotched lizards, Western fence lizards, Western skinks, Baja California tree frogs, Western toad tadpoles and numerous invertebrates, including a young tarantula spider. Visit <https://swhs.org/> for more information.



Coast Live Oak (*Quercus agrifolia*)

Sky Valley Volunteers

The Sky Valley Volunteers planted approximately 30 oak tree seedlings in the Southern Buffer Zone at the site last month. The seedlings are acorns from coast live oaks that have been gathered at the site, germinated, potted and stored in an onsite shade house. To learn more about the Sky Valley Volunteers, visit <https://www.skyvalleyvolunteers.org/>.