



2015 YEAR in REVIEW

NASA SANTA SUSANA FIELD LABORATORY

The end of a calendar year is always a good time for reflection. NASA is taking this opportunity to share the progress made in 2015 with investigations and cleanup activities in the two areas used historically for research, development, and testing of rocket engines at Santa Susana Field Laboratory (SSFL). The progress made over the past year moves NASA closer to our goal of a final cleanup that protects human health and the environment.

Demolition

NASA is performing demolition to prepare the site for final cleanup. Completing demolition in the Northern Service Area shows significant progress. The area looks quite different than it did at the beginning of 2015. Pre-demolition activities began in February starting with the removal of 220 tons of asbestos containing building materials. Over the summer and into early fall 17 structures were removed including obsolete engineering office buildings, laboratories, assembly buildings, and a fire station, as well as support structures such as paint shops, maintenance buildings, and supply sheds. Demolition of these structures generated roughly 558 tons of general construction materials, 1,404 tons of steel, and 3,758 tons of concrete. In addition, 4,510 tons of asphalt were generated from demolition of Northern Service Area roadways. Demolition debris was carefully inspected then material determined to be clean was recycled; the rest was safely transported off site for disposal at licensed facilities. After each structure was demolished, the area was regraded and hydroseeding was done to promote re-vegetation of native plants to minimize potential for erosion and dust migration. To see before and after photos of demolition, please visit <http://ssfl.msfc.nasa.gov> and click on "Demolition Updates."

Stormwater

Stormwater management is an important consideration in every one of NASA's activities at SSFL. Taking proactive steps to control runoff during site investigations, demolition, and cleanup activities ensures stormwater leaving the site meets the strict discharge limits associated with Boeing's National Pollutant Discharge Elimination System (NPDES) permit. In 2015 NASA made a number of preparations for El Niño forecasted to bring rain to the region this winter. For example, NASA evaluated rainfall records of past El Niño events to help anticipate the timing of storm events and to prepare for heavy rains that may result. As a precaution, extra sediment control and erosion materials such as straw wattles, sandbags, gravel, and rip-rap have been stockpiled and pre-staged in strategic locations at the site. Backhoes and other heavy equipment are ready to place these materials where needed as the weather dictates.

Investigations

Soil and groundwater investigations provide important data and a better understanding of site conditions. Results from these investigations inform the decisions NASA will make about final cleanup.

Soil

NASA completed "step-out" soil sampling in 2015. This resulted in extending cleanup boundaries and a revised footprint. It is now estimated that 600,000 cubic yards of soil may be remediated or removed to meet the 2010 Administrative Order on Consent (AOC) cleanup requirements. In May, a Draft Soil Data Summary Report was submitted to the Department of Toxic Substance Control (DTSC). The draft report summarizes the nature of chemicals in the soils and the vertical and horizontal extent of contamination at 16 sites. NASA will address DTSC comments, once received, and expects to submit the final report in 2016.

Groundwater

NASA made significant progress in 2015 by completing field work in four areas of impacted groundwater (AIGs). This field work included drilling 14 boreholes and conducting geophysics in the new boreholes and in existing wells. In August, NASA completed an aquifer test on the North Fault Zone to characterize the fault and assess the degree of hydraulic connection between it and other underground formations. Understanding this network helps NASA to plan for cleanup options that may use pumping and extraction as part of groundwater treatment.

Treatability Studies

Everyone is interested in which treatment technologies might be used to clean up soil and groundwater at SSFL. To answer this question, treatability studies are being conducted in the laboratory and in the field to evaluate how effective a technology is and whether or not it is possible to use on a larger scale.

Soil - Treating soil in place, called in-situ studies, assess whether using a technology would meet the AOC required cleanup levels, and thus reduce the volume of contaminated soil transported off site for disposal. The bench scale (laboratory) study consisted of two components: soil washing for soil collected from the Coca/Delta Fuel Farm and thermal desorption for soil collected from the Alfa/Bravo Fuel Farm.

Soil washing uses physical and chemical methods to extract and concentrate contaminants. Results from the treatability study show this technology can effectively achieve reductions - post-treatment concentrations were generally more than 95 percent lower than the pre-treatment (baseline) samples. The excessive water demands required by soil washing, especially when considering a full-scale version in this arid setting during prolonged local drought conditions make this technology impractical.

Thermal desorption heats the soil to very high temperatures and like soil washing, is a treatment process that reduces the volume of waste generated for offsite transportation and disposal. At high temperatures the test indicated 100 percent removal of contaminants. Further pilot testing may be warranted for thermal desorption as a choice for ongoing remediation efforts for soil at SSFL.

The field scale pilot study consisted of bioventing followed by infiltration of an oxidizing solution in the Bravo Skim Pond area. Bioventing introduces air (oxygen) to contaminated soil to promote biological activity, which leads to bioremediation of chemicals. In situ chemical oxidation (ISCO) is the application of an oxidizing agent to the subsurface that changes organics to inorganics such as carbon dioxide and water. Challenges associated with air flow, soil characteristics, and subsurface variability make these technologies impractical.

Landfarming was researched to evaluate it as an aboveground remediation technology. Landfarming is a technology for excavated soils that reduces concentrations of petroleum constituents (TPH) through biodegradation. Once the concentrations are at or below LUT values, the soil can be placed back into the excavation. Site conditions at SSFL are favorable to effectively implement landfarming.

Groundwater - As part of the site-wide cleanup effort, NASA, Boeing, and the Department of Energy (DOE) are coordinating treatability studies. Groundwater treatability studies include microbial characterization of rock core and pore water, bio-stimulation, thermal heating of rock core analyses, and bedrock vapor extraction (BVE). Fieldwork for NASA's BVE study was completed and data is being evaluated.

Community Outreach

Communicating with neighbors and the community remains a commitment of NASA's year in and year out. Community Outreach Coordinator Lori Manes had a busy and productive first year at SSFL maintaining frequent contact with community groups and interested stakeholders. She and cleanup team members – Program Director Allen Elliott and Project Manager Peter Zorba participated in presentations and meetings, including neighborhood council meetings, and kept in contact with the public by phone and email throughout the year. A new NASA SSFL Communications E-List was launched in 2015 as another way of communicating with the public. Interested stakeholders can sign up to receive E-List updates at <http://go.nasa.gov/1NCtSIK>. Subscribers stay connected by receiving regular emails about cleanup activities at SSFL. It is easy to subscribe and members can unsubscribe at any time. NASA published three editions of the online newsletter – FieldNOTE – in May, August, and November. The NASA SSFL Cleanup Website now features a Demolition Update section with the latest photos and news about demolition.

This Year in Review is intended to present highlights from the work accomplished at SSFL over the past year.

More information is available at <http://ssfl.msfc.nasa.gov> or contact:

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