



2013 YEAR in REVIEW

NASA continued environmental investigation and cleanup in two areas used historically for research, development, and testing of rocket engines at Santa Susana Field Laboratory (SSFL). We remain committed to the cleanup and to communicating with community members and neighbors about progress being made. Here is a sampling of the work we performed in 2013.

NASA SANTA SUSANA FIELD LABORATORY

SURFACE WATER & STORMWATER IMPROVEMENTS

Interim Source Removal Action

NASA reached an important milestone this year by completing an Interim Source Removal Action (ISRA). This cleanup effort, begun in 2009 and implemented in three phases, removed a total of 11,759 cubic yards of contaminated soil (through ex-situ or aboveground treatment) from identified source areas in NASA-administered Area II and its portion of Area I at SSFL. Conducted under the direction of the Los Angeles Regional Water Quality Control Board, the ISRA process evaluated chemicals of concern (COCs) in soil. By removing surface soils it reduced the potential of soil with COCs above the ISRA screening levels from being transported off site from Outfall 009. In Phase III at the Expendable Launch Vehicle (ELV) site, NASA introduced the use of 5-cubic-yard woven polypropylene waste containers. These lighter containers increased soil shipping capacity by 42% over the common metal containers carried on roll-off trucks. The shipped soil remained in the reinforced polypropylene waste containers for disposal at the appropriate landfill resulting in fewer truck trips and less diesel emissions. ISRA Phase I removed soil at the Area II Landfill area; Phase II was conducted at a portion of the Ash Pile/Sewage Treatment Plant (AP/STP); and Phase III was completed at the LOX, AP/STP, and ELV sites.

Best Management Practice

NASA implemented a voluntary stormwater Best Management Practice (BMP) on the hillside below the ELV site in the Service Area Road and helipad vicinity of Area II. The BMP along with ISRA cleanup (described above) are initiatives NASA has taken to enhance Boeing's efforts to meet National Pollution Discharge Elimination System (NPDES) permit limits at the outfalls. The BMP was based on a recommendation by the SSFL Stormwater Expert Panel to rehabilitate a drainage channel and install sedimentation tanks. These tanks contain tube settlers that slow stormwater velocity, allowing sediment to drop to the bottom of the tanks. Water is treated using media specifically designed for soils at this site. Treated water is returned to the channel it came from – the natural drainage that leads to the outfall. Operation of the BMP began in November. Because care was taken to protect and preserve vegetation and prevent erosion, many native plant species thrive today in areas where channel rehabilitation took place a short time ago.

SOIL INVESTIGATION

NASA continued to make progress on soil investigation activities culminating in the preparation of a sixth Draft Field Sampling Plan (FSP-6). FSP-6 is the final in a series of soil sampling work plans NASA submitted to the Department of Toxic Substances Control (DTSC) under the terms of the December 2010 Administrative Order on Consent (AOC). The AOC required NASA to conduct soil characterization at the two SSFL areas under its administration that include the 41.7-acre portion of Area I (the former Liquid Oxygen (LOX) Plant), and the 409.5-acres of Area II. NASA divided the site into five FSP areas and collected and analyzed soil and soil vapor chemical data in 2011 and 2012. The FSP-6 work plan includes closing data gaps that remained from previous samples that exceeded AOC screening levels. Community involvement has been an important part of the overall FSP process. DTSC and NASA have

hosted public technical roundtable meetings and tours (the FSP-6 meeting is anticipated in early 2014). Each Draft FSP has been made available for review on the DTSC SSFL website and has had opportunities for public input. FSP-6 field work is expected to start in early 2014. Soil sampling results from all FSPs will be included in a Final Chemical Data Report scheduled for 2015 and when that report is approved, a comprehensive soil cleanup effort will be proposed and implemented.

GROUNDWATER INVESTIGATION

NASA, the Department of Energy (DOE), and Boeing continued joint groundwater investigation efforts, and in 2013 DTSC approved the agencies to pursue individual investigations within their areas of responsibility. NASA is taking a unique approach by looking at Areas of Impacted Groundwater (AIG) which consist of five groundwater plumes in Area II and the portion of Area I that NASA administers. The five source zones are identified as LOX, B204/ELV, Alfa/Bravo, and Coca/Delta AIGs. To understand the nature and extent of each AIG, NASA will be evaluating faults and fracturing, seeps, springs (where applicable), and contaminant migration within the vadose and unsaturated zones. NASA believes these efforts will advance understanding of the groundwater profile and thus conclude NASA's groundwater investigation phase. NASA submitted a characterization work plan to DTSC to begin investigating the LOX plume.

TREATABILITY STUDIES

Groundwater Bedrock Vapor Extraction

In September, NASA submitted a groundwater treatability study work plan to DTSC. NASA intends to conduct the study at the former Bravo test stand area using vapor extraction in unsaturated bedrock (the subsurface above the water table). Bedrock vapor extraction or BVE uses vacuum blowers and extraction wells to collect contaminated soil vapor which then can be treated aboveground. During the study, NASA will be evaluating the ability to a) apply vacuum across the geology at the site, and b) remove contaminant mass from the shallow bedrock matrix. Data gathered will be used to evaluate how effective BVE is and whether or not BVE is a feasible remediation technology for use on a larger scale in the existing site conditions. NASA expects the testing to start in 2014 and run for about three months.

Groundwater Bench Scale

An ongoing multi-phased "bench scale" biostimulation study continued at Clemson University assessing whether rock and groundwater at SSFL have the bacteria present that naturally degrade chlorinated solvents. Having established that the bacteria do exist scientists performed a number of column tests to assess whether stimulating the bacteria growth can complete the dechlorination process. The initial study looks promising. Several amended columns show complete characterization and effectively increase or enhance the breakdown of the solvents. Work continues to assess whether dechlorination is occurring within the rock matrix or the fractures, or both.

Soil Multiple Studies

In a coordinated effort with DOE and the public, NASA looked at a broad range of soil remediation technologies in 2013. Sharing lessons learned between the agencies reduced research overlap and diminished the possibility of overlooking technologies for evaluation. NASA's goal is to understand what remediation technologies are possible for use at SSFL and whether the technologies are able to meet the AOC requirements of "cleanup to background levels" or Look-Up Table values (LUTs). NASA determined that of the technologies assessed, five had potential but not one had universal application, because conditions vary from site to site. NASA estimates that one-third of the 500,000 cubic yards of soil identified for removal could potentially be treated on site to LUT standards using one or more of the five identified technologies. NASA is testing, on a small scale – and as an alternative to excavation – bioventing with an in-situ chemical oxidation injection; landfarming with an ex-situ chemical oxidation application; soil washing; and thermal desorption.

ENVIRONMENTAL IMPACT STATEMENT

NASA is developing an Environmental Impact Statement (EIS) to evaluate potential environmental impacts from a Proposed Action to remediate the environment to a level that meets NASA's cleanup responsibilities and to perform demolition actions necessary to support both remediation and property disposition of the NASA-administered portion of SSFL. In July, NASA submitted the Draft EIS for DTSC and public review. In August, NASA hosted two Public Meetings where the public participated in discussions with NASA, and public comments were recorded. The 45-day public comment period deadline was subsequently extended until October 17 (due to the government shutdown). NASA reviewed comments and prepared a Response to Comments which will be included in the final EIS in early 2014.

SECTION 106 PROCESS

The EIS documents how NASA is integrating the "Section 106" consultation requirements of the National Historic Preservation Act into the National Environmental Policy Act (NEPA) review process. Implementing these processes ensures that the effects on cultural resources of the Proposed Action are being considered.

COMMUNITY OUTREACH

NASA remains committed to communicating with the public and we have been involved with community outreach in a number of ways. We posted several project updates to the SSFL Cleanup website (<http://ssfl.msfc.nasa.gov>). We responded to inquiries from traditional media outlets and occasionally used social media such as twitter @NASAenvcomm to communicate cleanup progress. Boeing, DOE and NASA sponsored several bus tours during the year, at which NASA handed out a new fact sheet entitled SSFL Past and Present, giving a brief overview of NASA-administered land and the cleanup status. We continued to maintain frequent contact during the year with community groups and interested stakeholders. FieldNOTE, our online newsletter was published in January and October. January's edition featured descriptions, photographs, and audio links associated with plant, animal, and habitat surveys. The October edition described the steps NASA took over the summer to construct and implement a voluntary stormwater improvement Best Management Practice. NASA also has participated in two DTSC-sponsored "Open Houses" where the public was able to learn about the activities of all the parties involved in the cleanup at SSFL.

Our 2013 Year in Review is intended to present highlights from the work we accomplished at SSFL over the past year. More details are available on <http://ssfl.msfc.nasa.gov>.

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