



FieldNOTE

OCTOBER 2013

An Update
on NASA's
Cleanup Efforts at
Santa Susana
Field Laboratory

Typically starting in November, the rainy season brings an average of 14 inches of rainfall annually to the 2,850-acre Santa Susana Field Laboratory (SSFL). The first rains of November tend to be absorbed quickly into the ground after the dry summer. Later in the rainy season, storm events often produce enough rain water that it accumulates on pavement and other surfaces. Some water infiltrates but much of it becomes runoff. This stormwater runoff flows downhill and drains into SSFL channels leading to on-site outfalls before being discharged to regional watersheds.

STORMWATER IMPROVEMENTS IN PLACE AHEAD OF THE RAINY SEASON

Construction of a stormwater Best Management Practice (BMP) is complete and NASA expects it to be operational ahead of this year's rainy season. This is the most recent initiative taken by NASA to improve stormwater management in

The Los Angeles Regional Water Quality Control Board regulates stormwater at SSFL outfalls. The Boeing Company holds the stormwater discharge permit known as the National Pollutant Discharge Elimination System, or NPDES permit for the entire SSFL site. NPDES limits, set in the permit, are monitored at the outfalls during storm events.

NASA-administered areas at SSFL. The BMP, described below, is a voluntary improvement NASA is taking in addition to the ongoing Interim Source Removal Action (ISRA) we have been implementing since 2009. Both efforts are designed to ensure that stormwater continues to meet the stringent water quality requirements [see sidebar] at SSFL Outfall 009 before surface water makes its way off site into the regional watershed.

NASA has been working closely with Los Angeles Regional Water Quality Control Board staff and the SSFL Stormwater Expert Panel to enhance Boeing efforts to meet NPDES permit limits at the outfalls. This independent panel consists of five surface water experts from universities and consulting firms. A mission of the Expert Panel has been to study the site and identify remedies to improve stormwater quality at the SSFL Outfalls 008 and 009. (A portion of NASA-administered land in Area II drains to Outfall 009.) Using soil sampling data and stormwater event monitoring data, the Expert Panel identified and ranked a set of recommendations for Boeing – and NASA – to consider. These included

active treatment systems, natural treatment systems, and BMPs. The problem, the Panel found, was that as stormwater flowed downhill and over surfaces in areas where ISRA chemicals of concern (COCs) have been identified, the water was picking up dioxins and transporting them along with sediment to the outfalls.

NASA decided to move forward with an Expert Panel recommendation and worked with the Panel to design a BMP focused on the hillside below the ELV (Expendable Launch Vehicle) site in Area II. [See aerial photo.] "Being a good steward is important to us and we wanted to do our part to help Boeing meet their stormwater permit obligations for the Site," said NASA SSFL Project Manager Peter Zorba. Implementing NASA's BMP will effectively capture, control, and mitigate stormwater runoff, and thus reduce the potential for COCs to be carried from the ELV hillside site to Outfall 009 during storm events. ■



NASA took action to improve stormwater quality by completing a BMP on the hillside below the ELV site in Area II.

BMP construction is complete

NASA COMPLETES BMP CONSTRUCTION

NASA constructed the BMP over a four month period – from June to October 2013. BMP construction consisted of two main parts: rehabilitating a drainage channel and installing sedimentation and filtration tanks.

first The first step was to rehabilitate a dilapidated asphalt-lined drainage channel that runs approximately 600 linear feet along Service Area Road. The channel was originally intended to collect water from the roadway, the nearby parking lots, and the adjacent hillside, and then to convey water to Outfall 009. Due to the broken asphalt and overgrown vegetation in the channel, stormwater, instead of being captured in the channel, was seeping into the ground beneath the channel and then running onto Service Area Road. There, the water would entrain and transport sediment further downstream towards Outfall 009.

While gaining access to the channel, NASA used precautions to protect and preserve native vegetation and prevent erosion. For example, NASA cut the plants and bushes (instead of digging them up) leaving the root structures in place to promote re-growth after construction was finished.

The broken asphalt was removed and the channel was re-graded and then sculpted to enhance and contain the downhill stormwater flow. A layer of hydroseed was put down in and adjacent to the channel. NASA used a seed mix of plant types native to SSFL that was recommended by the Stormwater Expert Panel. A permeable geotextile mat was installed in the channel to hold seeds and soil in place while allowing for

incidental infiltration and vegetation to grow up through the lofty weave of the fabric. [See photo.] Another layer of hydroseed was placed on top of the mat and soil along the channel. With this work completed, stormwater runoff from the adjacent hillside is contained within a more environmentally friendly channel bringing the water to the system collection area near Helipad Road.



The mat keeps soil in place. Plants grow through the mesh.



Drainage before construction.



Drainage after construction.

second The second step in BMP construction was to install a multi-tank system to promote settling of sediment in the water and to filter contaminants from the stormwater. A culvert and collection basin located below Helipad Road were restored and augmented to handle the flow of stormwater coming from the rehabilitated uphill channel. Next, a wet well was installed to convey the water under the road to where three 18,000 gallon above-ground tanks were positioned. [See photo.] The system is designed to operate as follows:

As stormwater pumps into the first two 18,000 gallon tanks it encounters tube settlers that slow the velocity of the stormwater, allowing the sediment to drop to the bottom of the tanks.



After being treated in these tanks, stormwater is returned into the natural drainage to Outfall 009.

Stormwater is gravity-fed to a third tank equipped with filter media specifically designed to remove dioxins.

Treated stormwater is returned to an existing drainage east of the tanks where it flows under Service Area Road and back into the natural drainage leading to Outfall 009.

NASA's BMP improves how stormwater moves from the ELV Service Area to Outfall 009. "I'm really proud of what we've accomplished here. I like that we've been able to fuse proactive 'Green' technologies with cutting edge environmental engineering to implement highly-ranked Expert Panel recommendations," said NASA's Zorba. "When the rain comes, we'll be ready." Full operation of NASA's BMP is expected this fall.

Monitoring during storm events at the outfall will continue. Improvements in stormwater quality are anticipated. ■

You can follow us on Twitter ► @NASAenvcomm

FOR MORE INFORMATION CONTACT **Merrilee Fellows** NASA Manager for Community Involvement

Phone 818-393-0754

Email mfellows@nasa.gov