

Santa Susana Field Laboratory

Monthly Status Report

October 2019

This monthly update informs the community about October 2019 Santa Susana Field Laboratory (SSFL) investigation and cleanup activities performed under the California Department of Toxic Substances Control's (DTSC) oversight. A project overview for The Boeing Company (Boeing), United States Department of Energy (DOE) and National Aeronautics and Space Administration (NASA) SSFL areas is included at the end of this report. Documents reviewed and commented on by DTSC are hyperlinked for easy access. Documents that are under DTSC's review will be made available once DTSC's comments have been issued.

SSFL Activities Completed During October 2019

DTSC

New Project Director

On September 19, 2019, DTSC issued notification letters to DOE, NASA, and Boeing indicating that Mr. Grant Cope, Deputy Director, will be DTSC's Project Director, responsible for overseeing the implementation of the 2010 AOCs with DOE and NASA, and will be DTSC's Project Coordinator, responsible for overseeing implementation of the 2007 Consent Order for Corrective Action. The notification became effective as of October 7, 2019.

California Environmental Quality Act (CEQA)

DTSC's draft Program Environmental Impact Report (Draft PEIR for the SSFL project) was issued for public review on September 7, 2017. A copy of the Draft PEIR and all the appendices are available on [DTSC's Envirostor SSFL Draft PEIR page](#). The 90-day public comment period ended on December 14, 2017. DTSC is currently compiling and reviewing comments that were submitted during the comment period as well as verbal comments received at public hearings. The response to comments will be included in the final PEIR.

Program Management Plan

[DTSC's draft Program Management Plan](#) for the SSFL project was issued for public review with the draft PEIR on September 7, 2017. Comments on the draft PMP are being evaluated by DTSC. The draft document will be finalized as part of the circulation of the final PEIR. A copy of the Draft PMP is available on DTSC's Envirostor SSFL draft PEIR web page.

Site Wide Air Monitoring

Air monitoring is being conducted to evaluate baseline concentrations of airborne dust, volatile organic compounds, and radionuclides at SSFL prior to commencing cleanup activities. This data will be used to evaluate what, if any, impacts to air quality are caused by cleanup activities. The baseline monitoring program is described in the [Final Baseline Air Monitoring Work Plan](#). Data collection for the baseline air monitoring program began on April 15, 2018.

The following Air Monitoring Quarterly Reports are available within the DTSC document library.

Boeing:

- [Boeing 1st Quarter 2018 Air Monitoring Report](#),
- [Boeing 2nd Quarter 2018 Air Monitoring Report](#),
- [Boeing 3rd Quarter 2018-2019 Air Monitoring Report](#)

NASA:

- [NASA 1st Quarter 2018 Air Monitoring Report](#)
- [NASA 2nd Quarter 2018 Air Monitoring Report](#)
- [NASA 3rd Quarter 2019 Air Monitoring Report](#)
- [NASA 4th Quarter 2019 Air Monitoring Report](#)

DOE:

- [DOE 1st Quarter 2018 Air Monitoring Report](#)
- [DOE 2nd Quarter 2018 Air Monitoring Report](#)
- [DOE 3rd Quarter 2019 Air Monitoring Report](#)

On March 19, 2019, [DTSC sent a letter to the Responsible Parties directing them to continue conducting Ambient Air Monitoring](#). On April 29, 2019, [Boeing issued a letter indicating it would continue conducting ambient air monitoring for one additional quarter](#). NASA and DOE are also continuing the baseline air monitoring. On July 24, 2019 [DOE issued a letter indicating that they would continue the baseline air monitoring program](#). On July 29, 2019 [Boeing issued a letter indicating it will continue Perimeter Air Monitoring for the Boeing Administrative Areas for one year](#). On July 31, 2019, [NASA issued a letter indicating it will continue air quality monitoring at the Santa Susana Field Laboratory](#).

NASA

Soils:

On May 31, 2019, DTSC issued a [Response Letter for the NASA Soil Data Summary Report](#) approving NASA's revised Soil Data Summary Report, which was submitted on February 22, 2017. NASA's report summarizes the results of soil samples collected to define the extent of chemical contamination at NASA-administered sites at SSFL. NASA will prepare and submit the Soils Remedial Action Implementation Plan (SRAIP) for cleanup of the contaminated soil at NASA SSFL areas as required by the DTSC-NASA Administrative Order on Consent (AOC). NASA is currently preparing a Supplement to their 2014 Environmental Impact Statement (EIS) to evaluate the revised soil remediation volumes reported in the Data Summary Report.

Groundwater:

On October 17, 2019, DTSC approved the [workplan for the Installation of a Slant Boring Near the Former LOX Plant submitted by NASA](#) to address a groundwater data gap in that area.

On October 15, 2018, DTSC issued a [DTSC comment letter on the May 2017 NASA Draft Groundwater RCRA Facility Investigation Report](#) which summarizes the results of NASA's 2013-2016 ground water source investigations conducted at four sites (the Former Liquid Oxygen (LOX) Plant Area, the Expended Launch Vehicle (ELV)-Building 204 Area, and the former Alfa-Bravo and Coca-Delta Test Stand Areas). The report consists of [NASA's May 2017 Draft Groundwater RCRA Facility Investigation Report Text, Tables, and Figures](#); [NASA's May 2017 Draft Groundwater RCRA Facility Investigation Report, Appendix A: LOX Area](#); [NASA's May 2017 Draft Groundwater RCRA Facility Investigation Report, Appendix B: B204-E L V Area](#); [NASA's May 2017 Draft Groundwater RCRA Facility Investigation Report, Appendix C: Alfa-Bravo Area](#); and [NASA's May 2017 Draft Groundwater RCRA Facility Investigation Report, Appendix D: Coca-Delta Area](#).

DTSC previously provided NASA with the following:

- [DTSC Comment Letter for NASA's Draft Former Liquid Oxygen Plant Area of Impacted Groundwater](#),
- [DTSC Comment Letter for NASA's Draft Building 204 and Expandable Launch Vehicle \(ELV\) Area of Impacted Groundwater](#), and
- [DTSC Comment Letter for NASA's Draft Alfa and Bravo Areas of Impacted Groundwater](#).

NASA is anticipating revising and submitting updated versions of these documents based on DTSC comments. DTSC is reviewing the [NASA Groundwater Draft](#)

[Corrective Measures Study](#) (CMS), dated August 2018. This document presents NASA's draft evaluation of the cleanup technologies and alternatives proposed for the remediation of contaminated ground water and groundwater source zones at the NASA-administered portion of SSFL.

Demolition:

Major demolition and debris removal activities at the NASA SSFL sites have been completed, preparing the sites for the commencement of soil cleanup activities. The historic NASA SSFL test stand structures remain in place pending future decisions on final disposition. Post-demolition stabilization, minor debris removal, and stormwater control activities are ongoing at the NASA sites.

Permitting:

In June 2016, NASA submitted a [draft post-closure permit renewal application for the Area II Surface Impoundments](#). DTSC has reviewed the documents for technical completeness. The effects of 2019 changes to post-closure permit requirements under California Code of Regulations Title 22, Article 6 are being evaluated by DTSC. The post closure requirements for the Area II Surface Impoundments are regulated by DTSC under RCRA laws and regulations because these impoundments are former hazardous waste facilities. The required cleanup levels for the impacted soil will continue to be dictated by the [2010 Administrative Order on Consent for Remedial Action \(AOC\)](#).

DOE

Soils:

On December 29, 2016, DOE submitted a [DOE Draft Chemical Data Summary Report](#). The report summarizes the results of soil samples collected to define the extent of chemical contamination in soil in Area IV and the Northern Buffer Zone at SSFL. [On April 24, 2018, DTSC provided comments on the DOE Draft Chemical Data Summary Report](#).

In 2012, US Environmental Protection Agency (US EPA), in coordination with DTSC and DOE, completed sampling efforts to define the nature and extent of Area IV radiologic contamination. US EPA's report ["Final Characterization of Soils Area IV and the Northern Buffer Zone"](#) was issued in December 2012.

DOE conducted soil treatability studies to evaluate onsite soil treatment technologies that could potentially reduce the volume of contaminated soil to be excavated and transported from Area IV. The treatability studies addressed [soil partitioning study](#), [evaluation of mercury valence state in soil](#), [bioremediation study final report](#), [phytoremediation study final report](#), and [natural attenuation Phase 1 report](#), and [natural](#)

[attenuation Phase 2 Final report](#), as well as [residual fuel hydrocarbon characterization methods](#). The soil treatability studies study plans, evaluation reports and [DOE Soil Treatability Study for SSFL Area IV Summary Report](#) have been uploaded to the [Soil Treatability Studies web page](#).

Groundwater:

DOE has completed the majority of its field investigation of ground water contamination at DOE sites at SSFL in support of the RCRA Facility Investigation's (RFI) objective of defining the nature and extent of ground water impacts. The findings from the RFI groundwater investigation are presented in "[Preliminary Draft RCRA Facility Groundwater Investigation Report \(Groundwater RCRA Facility Investigation Report\) Area IV, Santa Susana Field Laboratory, Ventura County, California](#)", dated June 16, 2017. On August 30, 2018, DOE submitted an updated and revised version of the [RCRA Facility Groundwater Remedial Investigation Report, Area IV](#) which is intended for partial completion of the site-wide Groundwater RFI that will be combined with efforts being implemented by Boeing and NASA to address deficiencies previously identified by DTSC. DTSC completed review of this document and provided [DTSC's July 31, 2019 comments on the Draft RFI Groundwater Remedial Investigation Report Area IV](#). DTSC's comments indicate that additional characterization of the Radioactive Materials Handling Facility (RMHF) and the Hazardous Waste Management Facility (HWMF) will occur after building demolition is complete, and that further development of the understanding of hydrological properties in Area IV is required during corrective measures studies and/or corrective measures design. [DOE submitted a revised Groundwater RFI Report in August 2019](#) to address DTSC's comments. On July 24, 2019, DOE submitted [DOE's First Quarter 2019 Groundwater Monitoring Report](#), and DTSC is currently reviewing the document.

Bedrock core hole investigations at the Former Sodium Disposal Facility (FSDF) found near-surface fractures (less than 100 feet below ground surface) containing ground water impacted by chlorinated volatile organic compounds at elevated concentrations. Deeper bedrock core hole RD-23 was drilled near shallow well RS-54 at FSDF, through the near surface bedrock zone to approximately 440 feet below ground surface. RD-23 was subsequently converted to a ground water monitoring well. DOE has indicated that VOCs observed in the deeper formation ground water are likely a result of downward movement of VOCs from the near surface (most likely contaminated water-filled fractures that can drain into the open borehole), rather than sourced from contamination at depth. On April 11, 2019, DOE submitted a [DOE Workplan for Modification of Monitoring Well RD-23](#) to evaluate this theory. The work plan proposes to retrofit core hole/monitoring well RD-23 to isolate the upper zone (vadose zone) having observed

VOC fracture water contamination from the deeper zone while at the same time, allowing for continued sampling access to the vadose zone and the deeper ground

water zones. This work is referred to as an isolation interval test. On June 26, 2019, DTSC approved the work plan.

The 2007 Consent Order for Corrective Action requires submittal of Corrective Measures Study Work Plans that detail the methodology for developing and evaluating potential corrective measures to remedy chemical contamination at SSFL. On September 27, 2018, [DOE's Draft Corrective Measures Study](#) (CMS) was submitted for DOE's Groundwater Area IV Responsibilities. The draft CMS evaluates and provides rationale for selection of possible ground water cleanup actions. Following completion of review of this document, DTSC provided draft comments to DOE via email dated July 9, 2019, and then met with DOE on July 17, 2019 to discuss DTSC's suggested revisions to the draft document. [DTSC's July 31, 2019 comments regarding DOE's Draft Corrective Measures Study](#) have been issued. A revised CMS is anticipated to be submitted by DOE in 2019.

Starting in November 2017, DOE initiated the extraction of ground water from well RS-54 as part of the Groundwater Interim Measure (GWIM) at the Area IV Former Sodium Disposal Facility (FSDF). [DOE's January 2019 Update on the Former Sodium Disposal Facility Groundwater Interim Measure \(Revision 4\) has been issued](#). This document is the fourth status report for the FSDF GWIM activities. The objective of the GWIM at the FSDF is to remove contaminant mass to reduce the threat of contamination to Chatsworth Formation ground water. Well RS-54 is relatively shallow and is within the footprint of the former pond. It extends over 40 feet into bedrock and has exhibited elevated concentrations of trichloroethene in ground water. It is used to monitor shallow ground water that is likely derived by rainfall that infiltrated to the subsurface and is impacted by contaminants contained in near-surface bedrock fractures. DOE has indicated that water levels in this well are highly dependent on seasonal rainfall. The well is dry during below average rain years and has measurable levels of water that can be extracted during average rainfall years. Groundwater extraction from well RS-54 has occurred since November 2017 when the water level was 22 feet (ft.) above the bottom of the well. Since the start of pumping, the water has been pumped down to the level of the pump inside the well 26 times. In March 2018, the pump was replaced with a new pump and placed one-foot lower than the previous pump. Following each pumping event, the lowered water level requires more time to rise and recover, resulting in less water available to remove over time. As of January 2019, the water level in this well is still low. Nearby core hole C-21, drilled in June 2018 to 53 ft. below ground surface (bgs), captured a sufficient amount of shallow fracture bearing ground water to allow for previous sampling and purging. From November 2017 through December 2018, approximately 330 gallons of water were pumped from shallow well

RS-54, and approximately 55.5 gallons were extracted from core hole C-21. DOE will continue to monitor the water levels of these wells and will sample if a sufficient amount

of water recovers. Well development water and purge water generated since July 2018 has been characterized and taken offsite for proper treatment and disposal at a licensed facility.

DOE continues to evaluate the recent pumping and analytical results, and periodically provides progress reports to DTSC regarding ongoing implementation of the GWIM.

Biological Issues Associated with Cleanup:

Biological issues affect the overall SSFL cleanup project. Studies and permits will need to be conducted prior to starting cleanup. Continued communications between DTSC, agencies and RPs will be necessary to address main issues and develop a path forward for addressing biological issues associated with the proposed cleanup.

Permitting:

Safe closure and removal of the structures and buildings is an important step towards completion of the soil investigation and cleanup at DOE's portion of SSFL. On August 13, 2018, DTSC released [DOE's Draft Resource Conservation and Recovery Act \(RCRA\) Closure Plans \(Plans\) for the Radioactive Materials Handling Facility for Buildings 4021, 4022, and 4621 and adjacent outside storage yard](#), the [Closure Plan \(Revision 0\) for the Hazardous Waste Management Facility: Buildings T029 and T133 ETEC Part 1](#) and the [Closure Plan \(Revision 0\) for the Hazardous Waste Management Facility: Buildings T029 and T133 ETEC Part 2](#) for public review and comment. These plans address closure (or demolition and removal) of remaining structures in Area IV which have either RCRA permit or Interim Status authorization, meaning they are regulated with respect to handling, treatment, storage and disposal of hazardous wastes. DOE's "[Standard Operating Procedure for Demolition of Facilities in Area IV at the Santa Susana Field Laboratory, Revision C](#)", dated August 2016 (SOP) was also made available for public review and comment. Any contaminated soil and ground water remaining after demolition will be addressed under the 2010 AOC and the 2007 Consent Order for Corrective Action, respectively. DTSC issued a public notice and established a public comment period from August 13, 2018 through October 12, 2018. On August 30, 2018 and September 8, 2018, DTSC held two public hearings to receive public comments on the Plans. [Public comments were received for the Standard Operating Procedure for the Demolition of Facilities in Area IV, Revision C](#) during the public comment period and are now posted online. DTSC will consider and respond to all comments received on the Closure Plans. DTSC anticipates providing a responsive summary with the final Closure Plans. The Closure Plans will not receive final approval until DTSC's PEIR is completed and certified.

Demolition:

On September 27, 2019, DOE issued a [Record of Decision for the Final Impact Statement for Remediation of Area IV and the Northern Buffer Zone of the Santa Susana Field Laboratory, California](#). In the Record of Decision, DOE announced its decision to demolish the 18 buildings it owns in Area IV of the SSFL and dispose of or recycle the materials off site. This Record of Decision only addresses demolition. DOE indicates it will issue subsequent Records of Decision once a decision for soil and groundwater remediation has been made.

In a letter dated October 7, 2019 to DOE, the California Environmental Protection Agency (CalEPA) clarified the State of California's expectations with respect to DOE's commitments to remediate the SSFL site in accordance with the 2010 Administrative Order on Consent. The letter noted DOE's Record of Decision and also noted that on September 24, 2019, DOE filed a Notice of Status Update with the US District Court, Northern District of California in ongoing litigation stating that DOE intends to commence implementation of the September Record of Decision immediately, and that building demolition may begin as soon as October 24, 2019. CalEPA reiterated in the letter that DOE may not legally proceed with building demolition without prior written approval from DTSC. The 2010 Administrative Order on Consent requires DOE to submit to DTSC, for its review and approval, a demolition plan for the Area IV buildings. That plan must describe DOE's activities to sample and fully characterize the buildings to determine if they are contaminated with radiological or chemical contaminants above background levels.

In a letter dated October 16, 2019 to DOE, DTSC again clarified that DOE may not proceed with any Area IV building demolition without DTSC approval and that DOE's Notice does not satisfy DTSC's requirements for keeping DTSC updated with a demolition schedule, nor does it articulate how DOE will allow for required DTSC oversight of DOE's building demolition activities under the 2010 Administrative Order on Consent. DTSC required DOE to revise the August 2016 Standard Operating Procedure for Demolition of Facilities in Area IV at the Santa Susana Field Laboratory, Revision C (SOP) to be consistent with the administrative Order on Consent which outlines the process for preparation and submittal of demolition and waste disposal plans for all buildings located in Area IV regardless of building ownership or Resource Conservation and Recovery Act (RCRA) status. DTSC required that the SOP must set forth the process for preparation and submittal of closure plans for RCRA-permitted buildings. The SOP must also either provide that DOE will characterize the buildings' radionuclides to background standard for purposes of determining if radiological contamination exists and require that all debris contaminated with radioactive contaminants above local background levels be disposed in a licensed low-level radioactive waste facility or an authorized low-level radioactive disposal facility at a DOE site; or provide for the disposal of all Area IV building demolition debris at a

licensed low-level radioactive waste facility or an authorized low-level radioactive disposal facility at a DOE site. DTSC requested DOE to provide written response as to which option DOE will pursue and confirm that it will not commence any demolition activities pending DTSC's approval of a revised SOP and required demolition-related documentation (e.g., building demolition plans, etc.). DTSC reiterated its commitment to expedite cleanup of SSFL and pledged to immediately work with DOE to implement either option to allow building demolition and disposal to proceed in a health-protective manner.

Boeing

Surficial Media Investigation:

Boeing is finishing soils investigation work in Area I, Area III, and the southern buffer zone. Boeing's surficial media characterization work is divided into units identified as Boeing RFI Subareas:

- 1A North, 1A Central, 1A South
- 1B North, 1B Southwest, 1B Southeast
- 5/9 North, 5/9 South, and
- Group 10

Boeing is following the Data Quality Objectives (DQOs) process and standard operating procedures for planning and conducting sampling work to complete the characterization of surficial media. The purpose of the current phase of surficial media investigation work is to collect sufficient data to fill data gaps that were identified in the 2007 and 2008 Group RFI Reports. All Boeing sites are in the data evaluation and reporting work phases.

- **Subarea 5/9 South** - Systems Testing Lab (STL-IV), Compound A, Sewage Treatment Plant (STP)-3, and Environmental Effects Laboratory (EEL), and areas not associated with RFI sites in Subarea 5/9 South
 - On April 27, 2017, [Boeing submitted Responses to DTSC Review Comments on the June 2015 RCRA Facility Investigation Data Summary Report](#) and the [revised RFI Data Summary Report for Subarea 5/9 South](#) on April 27, 2017.
 - On April 25, 2018, DTSC sent [DTSC comments on the Boeing Company's RFI Data Summary and Findings Report](#) to Boeing and on May 24, 2018 DTSC received [Boeing's Responses to DTSC Comments on the RCRA Facility Investigation Data Summary and Findings Reports, Boeing RFI Subarea 5/9 South](#). On June 12, 2018 DTSC received supplemental information associated with the responses. DTSC reviewed the responses to comments and supplemental information and

on July 11, 2018, submitted [DTSC response to Boeing's supplemental information and May 24, 2018 comments](#). DTSC and Boeing have been discussing vadose zone to ground water source area issues. On September 11, 2018 Boeing submitted a [Boeing memo regarding STL-IV Supplemental Vadose Zone to Ground water Source Area Information](#). DTSC provided [DTSC's comments to Boeing's September 11, 2018 memo](#) on October 29, 2018. Boeing responded to DTSC comments dated July 11, 2018 in a [Boeing RFI Response memo](#) dated April 25, 2019. Boeing revised their memo and resubmitted it in a Revised Boeing RFI Response memo dated September 17, 2019.

- **Subarea 1A Central** - Building 359, Advanced Propulsion Test Facility (APTF), and Happy Valley North and areas not associated with RFI sites in Subarea 1A Central
 - On May 24, 2017, [Boeing submitted responses to DTSC comments on the RFI Data Summary and Findings Report](#) and [Boeing responses to DTSC's comments on the revised RFI Data Summary Reports for Subarea 1A Central](#). DTSC sent [DTSC comments on the Boeing RFI Data Summary and Findings Reports for Subarea 1A Central](#) to Boeing on June 20, 2018.
- **Subarea 10** (Southern Buffer Zone)
 - Boeing submitted the [Boeing RFI Data Summary Report for Subarea 10](#) on June 19, 2017. On April 2, 2019, [DTSC sent comments on the Boeing RFI Data Summary and Findings Reports for Subarea 10](#) to Boeing.
- **Subarea 5/9 North** - Silvernale, Engineering Chemistry Laboratory (ECL), and areas not associated with RFI sites in Subarea 5/9 North.
 - Boeing submitted the RFI Data Summary Report for Subarea 5/9 North on July 26, 2017. That report can be found on the [Boeing Subarea 5/9 North section of the SSFL Document Library](#). On May 23, 2019 [DTSC sent comments on the Boeing RFI Data Summary and Findings Reports for Subarea 5/9 North](#) to Boeing.
- **Subarea 1A South** - Canyon, Happy Valley South, Laser Engineering Testing Facility (LETf)/CTL-I, and areas not associated with RFI sites in Subarea 1A South.
 - Boeing submitted the [Boeing RFI Data Summary and Findings Reports RFI Subarea 1A South](#) to DTSC on August 22, 2017.
 - DTSC is reviewing the report.

- **Subarea 1B Southeast** – Chemical Test Lab (CTL)-III, Perimeter Pond, and areas not associated with RFI sites in Subarea 1B Southeast.
 - Boeing submitted the RFI Data Summary Report for Subarea 1B Southeast on September 29, 2017. That report can be found in the [Boeing Subarea 1B Southeast section of the SSFL Document Library](#).
 - DTSC is reviewing the report.
- **Subarea 1B North** - Bowl, R-1 Pond, and areas not associated with RFI sites in Subarea 1B North.
 - Boeing submitted the RFI Data Summary and Findings Report for Subarea 1B North on November 19, 2017. This report can be found in the [Boeing Subarea 1B North section of the SSFL Document Library](#).
 - DTSC is reviewing the report.
- **Subarea 1A North** - B-1, Instrument & Equipment Laboratory (IEL), Area 1 Landfill, and areas not associated with RFI sites in Subarea 1A North.
 - Boeing submitted the RFI Data Summary and Findings Report for subarea 1A North on December 18, 2017. This document can be found on the Boeing Subarea 1B North section of the SSFL Document Library.
 - DTSC is reviewing the report.
 - Former Shooting Range
 - The Former Shooting Range is not part of Subarea 1A North, but the site information is included here as the Former Shooting Range is located on the Mountains Recreation Conservancy Authority, Sage Ranch property which is adjacent to Subarea 1A North and some soil data overlap between the Former Shooting Range area and Subarea 1A North.
 - The work is being conducted under an approved work plan and addendum that is available on the [Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting range Area section of the SSFL Document Library](#).
 - Field work to investigate soils to define the extent of lead shot and clay pigeons as well as characterize the soil for lead, arsenic, antimony, and polynuclear aromatic hydrocarbon concentrations began in late September 2016 and was completed on January 18, 2017.
 - Laboratory analysis for soil sampling is complete.
 - Boeing constructed a fence to prevent access to a 1,200-foot section of the Sage Ranch Loop Trail where sampling results indicate remediation is necessary to address lead concentrations in the soil.

- Boeing released a statement to community members regarding the status of the sampling results, the need for remediation, and the closure and re-routing of a portion of the trail.
- The [Boeing Draft Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting Range Investigation Area Data Summary Report and Findings Report](#) was submitted to DTSC on April 11, 2017.
- DTSC provided Boeing with [DTSC comments on the Draft Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting Range Investigation Area Data Summary and Findings Report](#) on May 5, 2017.
 - DTSC received responses to DTSC comments on July 11, 2017.
- DTSC responded to Boeing with a [DTSC Letter regarding Additional Characterization of Contaminant Migration at the Former Rocketdyne employee Shooting Range](#). This letter, dated November 15, 2017, required Boeing to conduct further characterization and evaluation of the impacted media that may have entered the Northern Drainage from the Former Shooting Range.
- DTSC received the Work Plan Addendum for additional field work on February 28, 2018. The Work Plan Addendum can be found in the [Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting range Area section of the SSFL Document Library](#).
- DTSC provided Boeing with [DTSC comments on the Draft Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting range Area Investigation Work Plan Addendum](#) on April 13, 2018.
 - DTSC received the [Boeing Responses to DTSC comments on the Draft Former Rocketdyne-Atomic International Rifle and Pistol Club Shooting Range Area Investigation Work Plan Addendum](#) on May 4, 2018.
 - A copy of the Revised Work Plan Addendum can be found in the [Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting range Area section of the SSFL Document Library](#).
 - DTSC approved the Work Plan Addendum with additional requirements in a May 23, 2018 [DTSC Letter on the Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting Range Area Investigation Work Plan Addendum](#).
 - The additional field work was conducted between June 18-20, 2018. Boeing submitted the Revised Draft Shooting

Range Data Summary and Findings Report on October 15, 2018. This report is available on the [Former Rocketdyne-Atomics International Rifle and Pistol Club Shooting Range Area section of the SSFL Document Library](#). DTSC is currently reviewing the report.

- On September 12, 2017 DTSC and the Los Angeles Regional Water Quality Control Board conducted a site inspection of recently installed stormwater best management practices (BMPs) used to control stormwater runoff from the Former Shooting Range into the Northern Drainage. Based on the site inspection and recommendations from DTSC and the LARWQCB the BMPs were evaluated by the Expert Panel and subsequently upgraded.
- **Subarea 1B Southwest** - Area I Burn Pit, CTL-V, and areas not associated with RFI sites in Subarea 1B Southwest.
 - Boeing submitted the RFI Data Summary and Findings Report for Subarea 1B Southwest in late December of 2017 and it was received by DTSC on January 2, 2018. A copy of this report is available on the Boeing Subarea 1B Southwest section of the SSFL Document Library.
 - DTSC is reviewing the report.
- **Path Forward for Submittal of Final Data Summary and Findings Reports**
 - On March 13, 2019 [Boeing submitted a memo titled Approach for Submittal of the Final Data Summary and Findings Reports, Boeing RFI Subareas, Santa Susana Field Laboratory, Ventura County, California.](#)
 - On April 2, 2019, DTSC provided Boeing with [DTSC comments on the Proposed Approach for Submittal of Final Data Summary and Findings Report, Boeing RFI Subareas.](#)
 - Boeing responded to DTSC comments in a [Boeing memo titled Response to DTSC Comments on proposed Approach for Submittal of Final Data Summary and Finding Reports, Boeing RFI subareas; RCRA Facility Investigation Data Summary and Findings Report, Boeing RFI Subarea 5/9 South; RCRA Facility Investigation Data Summary and Findings Report, Boeing RFI Subarea 1A Central](#) dated April 25, 2019.
 - Boeing revised their memo and resubmitted it in a Boeing Memo titled [Final Proposed Approach for Submittal of Final Data Summary and Findings Reports, Boeing RFI Subareas](#) dated September 17, 2019.

- **Risk Assessment**

- Risk Assessments were included in the two draft RFI Data Summary and Findings Reports submitted to date (Subareas 5/9 South and 1A Central).
- Based on DTSC review comments and changes in risk assessment input parameters by the US EPA, the risk assessment process will need to undergo some changes.
 - Boeing submitted the [Boeing Draft Standardized Risk Assessment Methodology \(SRAM\), Revision 3](#) on May 18, 2017.
 - DTSC sent Boeing a letter titled [DTSC Comments on Boeings Draft Standardized Risk Assessment Methodology Work Plan Revision 3](#) on January 16, 2018 rejecting the revised work plan.
 - Boeing contested DTSC's rejection of the draft SRAM-3 in a letter dated March 15, 2018. DTSC responded in a letter dated April 4, 2018 and agreed to calculate the risk for the resident and resident with garden. Boeing further contested items in the April 20, 2018 letter, then conceded these items in a letter dated May 21, 2018. These letters are summarized in the [Letters Referenced in the Cover Letter to the Revised SRAM 3 dated July 24, 2018](#). Boeing submitted a [revised Boeing SRAM Work Plan, Revision 3 dated July 2018](#). DTSC is reviewing this revised work plan.
- In a May 18, 2018 letter, [DTSC requested 95 percent Upper Confidence Limits \(95 UCL's\) for 5/9 South](#) and in June of 2018 [DTSC Requested a 95 UCL's for 1A Central](#). DTSC was provided with [Boeing's 95 UCLs for 5/9 South sites](#) and [Boeing's 95 UCLs for 1A Central sites](#) in July 2018. DTSC responded with a [DTSC letter requesting additional information for the 5/9 South sites](#) in July 2018. Boeing submitted a [Boeing Response to DTSC's Additional request for 95 UCL Concentrations for Boeing RFI Subarea 5/9 South](#) to DTSC, dated August 28, 2018. DTSC responded with a [DTSC letter requesting additional information for the 1A Central sites](#) in August 2018. On September 11, 2018 [Boeing's response to DTSC's Additional Request for 95 UCL Concentrations for Boeing RFI Subarea 1A Central](#) was submitted to DTSC.

Groundwater:

- Faults
 - In 2016, Boeing submitted [Boeing Draft Hydrogeologic Characterization of Faults memo, Boeing Draft Hydrogeologic Characterization of Faults appendices](#) and an [update to the Boeing Draft Hydrogeologic Characterization of Faults Memo](#). The concepts presented in the faults

technical memorandum have been incorporated into the draft Remedial Investigation (RI) Report.

- DTSC is evaluating the faults work within the context of the draft RI Report.
- Ground water Flow Model
 - Boeing continues to work to update the 3D Ground water Flow Model.
- Draft Remedial Investigation Report
 - In June of 2017 Boeing submitted a draft RI Report summarizing the results of ground water characterization work for Area I, Area III and the Southern Buffer Zone. DTSC provided [comments](#) on the Draft Groundwater RFI Report to Boeing on October 25, 2019.
- Boeing Sites in Area IV
 - In May of 2018 Boeing submitted a draft RFI Data Summary and Findings Report summarizing the results of ground water characterization work for Boeing ground water sites in Area IV. A copy of this report is available in [the RFI Reports section of the SSFL Document Library](#). DTSC is reviewing the document.
- Corrective Measures Studies
 - In September of 2017, Boeing submitted a [Boeing Feasibility Study Work Plan Addendum](#) to further explain their approach for conducting Corrective Measures Studies on ground water and vadose zone bedrock.
 - On June 27, 2018, DTSC sent a letter to Boeing DOE, and NASA requesting more information about cleanup technologies and the development of alternatives to be evaluated in the CMSs.

Building Demolition:

The December 2018 [final judgment in the 2013 litigation over the role of DTSC and the Department of Public Health \(DPH\) in the demolition of Boeing-owned buildings in SSFL Area IV](#) is in the process of appeal by the petitioners.

Permitting:

In October 2015, Boeing submitted a draft post-closure permit renewal application for the Areas I and III Surface Impoundments and a separate Closure Plan for the Thermal Treatment Facility. DTSC is currently reviewing the Areas I and III Surface Impoundment post-closure permit application for technical adequacy. DTSC has temporarily suspended review of the Closure Plan for the Thermal Treatment Facility pending ongoing discussion of risk assessment requirements. Documents relating to

the post-closure permit renewal application can be found on [The DTSC's Envirostor Page for the Boeing Co-Canoga Park facility](#)

The post-closure requirements for the Area I and III Surface Impoundments and closure requirements for the Thermal Treatment Facility are regulated by DTSC under RCRA laws and regulations because both are former hazardous waste facilities. The required cleanup levels for the impacted soil and ground water will continue to be dictated by the 2007 Consent Order.

Sitewide Groundwater Characterization and Cleanup:

The SSFL ground water characterization and cleanup program is being conducted by the three responsible parties; Boeing, DOE, and NASA. The ground water characterization and cleanup program consists of:

- Investigation and characterization of ground water contamination;
- Ground water monitoring;
- Ground water interim measures; and
- Treatment of contaminated ground water with permitted discharge from the Ground water Extraction and Treatment System.

Groundwater Remedial Investigation (GWRI):

Data gaps were identified in the 2009 Draft Site-wide GWRI Report by the RPs. DTSC also identified additional data gaps that were presented in the GWRI comments. The data gap work has been divided into six categories:

- Data gaps identified in the Remedial Investigation (RI) Report;
- Source Zone Characterization;
- Characterization of seeps and springs;
- Characterization of faults;
- Ground water flow model; and
- Contaminant transport modeling.

Documents regarding the Draft GWRI report can be found on [Sitewide Groundwater Remedial Investigation Report section of the SSFL Document Library](#).

Status of GWRI Data Gap Work:

Boeing, DOE and NASA have submitted Draft RFI Reports report summarizing the results ground water investigations conducted at their respective sites. DTSC is reviewing and issuing comments on the documents. Additionally, Boeing, DOE, and NASA are working on a single, overarching site summary document for ground water characterization at the SSFL site.

Ground water modeling efforts are proceeding:

- Ground water flow model
 - The conditionally approved, ground water flow model work plan presents an approach for a mountain scale ground water flow model.
 - Work from the fault studies and data from monitoring wells installed since 2009 will be used to supplement the ground water flow model.
 - DTSC, Boeing, DOE, and NASA are considering applying the revised model at the remedy design stage of the project.
- Contaminant transport modeling
 - Boeing, DOE, and NASA continue to develop the approach for contaminant transport modeling.

Sitewide Groundwater Treatability Studies:

Treatability studies have been conducted on several technologies to be evaluated in the feasibility study. The treatability studies address both soil/bedrock and ground water contamination. Treatability studies can be either field studies or laboratory studies.

- Four ground water laboratory studies were conducted:
 - Chemical oxidation using potassium permanganate;
 - Thermal heating of rock core; DOE submitted a revised white paper study of thermal heating of fractured bedrock to DTSC in September 2017. DTSC reviewed the document and submitted DTSC Review of Response to DTSC Comments and Revised Draft White Paper on Thermal Remediation Technologies for Treatment of Chlorinated Solvents to the RPs on February 7, 2018.
 - Microbial characterization and Bio-Stimulation of rock core, pore water;
 - On July 10, 2017, Boeing submitted to DTSC [Boeing's Final Report, Laboratory Evaluation of Biostimulation to Treat Chlorinated Ethenes in the Chatsworth Formation](#).
 - DTSC is reviewing the report.
- Two field studies were conducted:
 - In-situ chemical oxidation (ISCO) using potassium permanganate;
 - On June 14, 2016 [Boeing developed a Final Report of Results, ISCO Field Experiment](#) and submitted it to DTSC.
 - [DTSC issued comments on the Review of Final Report of Results for the ISCO Field Experimentation](#) to Boeing on June 16, 2017. Boeing provided responses to DTSC comments on August 28, 2017. DTSC provided [DTSC responded to the Review of DTSC](#)

[Comments on the Final Report of the results for the ISCO Field Experimentation](#) on both the responses and the report on February 7, 2018. On June 12 2018, [Boeing provided a Response to DTSC Comments \(dated February 7, 2018\), on the Final Report of Results, ISCO Field Experimentation](#) to DTSC. On March 18, 2019, DTSC issued [DTSC's Response to Boeing June 12, 2018 Response to DTSC Comments \(Dated February 7, 2018\) on the Final Report of Results for the ISCO Field Experiment](#). No further action will be taken on this report.

- Bedrock vapor extraction (BVE);
 - Conducted at NASA's former Bravo test area in late 2014.
 - NASA has submitted a [NASA Technical Memorandum: Results from Bravo Bedrock Vapor Extraction Treatability Study](#) dated November 2015 to DTSC.
 - DTSC has reviewed and has provided comments in the [DTSC Review of Technical Memorandum: Results from the Bravo Bedrock Vapor Extraction Treatability Study](#) on October 14, 2016.

Groundwater Monitoring:

Groundwater monitoring reports are submitted quarterly, with the fourth quarter submittal being an annual report. DTSC reviews the quarterly reports for completeness and compliance but may not issue written comments on the specific quarterly report if significant issues are not present. If compliance issues arise during review of the quarterly ground water monitoring reports, DTSC directs the Responsible Parties (RPs) to take action to comply and follow up to ensure compliance is achieved and maintained. Groundwater monitoring reports and DTSC responses are available on the [Quarterly/Annual Groundwater Reports section of the SSFL Document Library](#).

The annual reports present the results of the previous year's monitoring and undergo a more thorough review. The [DOE Report on Annual Groundwater Monitoring, Area IV, 2018](#), [NASA Area I LOX and Area II Annual 2017 Groundwater Monitoring Report](#) and [Boeing Report on Annual Groundwater Monitoring 2017](#) were submitted to DTSC on March 12, 2018; February 21, 2018; and February 26, 2018; respectively. [DOE Report on Annual Groundwater Monitoring, Area IV, 2018](#); [NASA Area I LOX and Area II Annual 2018 Groundwater Monitoring Report](#); and [Boeing Report on Annual Groundwater Monitoring, 2018](#) were submitted to DTSC on March 11, 2019; February 7, 2019; and February 25, 2019 respectively. DTSC is reviewing the Reports.

Groundwater Interim Measures (GWIM):

The GWIM project includes the operation of fourteen ground water extraction wells. Pumping started at the first of the 14 extraction wells. The water is being pumped to the existing Ground water Extraction Treatment System (GETS) for treatment. GETS effluent is regulated by the Los Angeles Regional Water Quality Control Board (LARWQCB).

On October 2, 2017, the LARWQCB enrolled Boeing under [General Waste Discharge Requirements to regulate injection of GETS effluent to WS-5](#). [Surface discharge of GETS effluent regulated under an NPDES permit](#) can proceed after securing a Streambed Alteration Agreement with the California Department of Fish and Wildlife.

- GWIM and GETS infrastructure is complete, and permits are in place.
- Staged operation of the GWIM (pumping at C-1) began on July 18, 2019.
- As described above, DOE is actively monitoring the slow water level recovery from pumping well RS-54 and Core Hole C-21 at FSDF in Area IV. DOE is handling and disposing of the extracted ground water as liquid waste.
- Water levels at SP-890, SP881, and SP-882 are being monitored. If seepage occurs, it is mechanically collected. When GWIM operations in Area II begin, the seeps will be dewatered through operation of extraction well WS-9A.

Groundwater RFI Report:

Working toward a [Groundwater RFI format approved by DTSC in a letter dated January 13, 2017](#), Boeing, DOE, and NASA prepared and submitted individual report sections for their specific ground water characterization activities. The individual report sections were submitted by Boeing on June 2, 2017 ([Boeing Site-Wide Groundwater RFI Report](#) and [Boeing Site-Wide Groundwater RFI Report Appendices](#)), DOE on June 15, 2017, and NASA on May 8, 2017. DTSC is reviewing the reports and submitted comments on the DOE section on March 25, 2018. [DOE submitted an updated revised Final RCRA Facility Groundwater RI report on August 30, 2018](#), and [DTSC submitted a conditional approval letter dated July 31, 2019](#). [DTSC submitted comments on the NASA LOX report](#) section in April 2018, [DTSC submitted comments on the NASA Building 204 and ELV report](#) section in June 2018, [DTSC submitted comments on the NASA Alfa and Bravo Areas report](#) section in July 2018 and [DTSC submitted comments on the NASA Groundwater RFI report](#) section in October 2018. DTSC submitted comments on the [Boeing Groundwater RFI report](#) in October 2019. The individual sections will be part of a single sitewide report deliverable.

Feasibility Study/Corrective Measures Study:

In June 27, 2013, [DTSC has conditionally approved the Feasibility Study work plan](#). Cleanup of sitewide ground water and surficial media in Boeing areas will be regulated

under Chapter 6.5 of Division 20 of the Health and Safety Code (California Hazardous Waste Control Law and the Resource Conservation and Recovery Act authorizations). Soils in DOE and NASA areas will be cleaned up under the respective AOCs, and Soils Remedial Action Implementation Plans (SRAIPs) will be prepared to describe their respective cleanup activities. DTSC has received, and is reviewing Boeing's, DOE's, and NASA's Corrective Measures Studies Work Plan addenda for ground water and vadose zone bedrock. On June 27, 2018 DTSC sent a letter to the RPs asking for additional information regarding assessments and criteria to be used in the CMS.

Public Outreach:

During the month of October 2019, Public Participation continued to coordinate with the project team regarding the:

- SSFL Community Meeting and logistics;
- Response to Comments for the SSFL draft PEIR and draft PMP;
- Response to Comments for the United States Department of Energy Draft RCRA Closure Plans for the Radioactive Materials Handling Facility (RMHF), the Hazardous Waste Management Facility (HWMF) (Closure Plans) and the DOE Standard Operating Procedure for Demolition of Facilities in Area IV at the Santa Susana Field Laboratory, Revision C, August 2016 (SOP); and
- General project inquiries from the public.

The following documents were also uploaded to the Document Library on DTSC's website:

- [DTSC Comments on the Hydrogeologic Characterization of Faults Report](#)
- [Letter from Meredith Williams, DTSC to John Jones, DOE regarding Department of Energy Standard Operating Procedure for Demolition of Facilities in Area IV](#)
- [NASA Post Closure Permit Third Quarter 2019 Report](#)
- [SSFL Monthly Update - August 2019](#)
- [SSFL Monthly Update - July 2019](#)

Documents Submitted in October 2019

[The Stormwater Pollution Prevention Plan \(Version 6 for Compliance with 2015 NPDES Permit\) Santa Susana Field Laboratory.](#)

SSFL Activities Anticipated after October 2019

DTSC

- DTSC is compiling comments received on the Draft PEIR and Draft PMP and will generate responses to those comments.

NASA

- NASA will prepare the Soils Remedial Action Implementation Plan (SRAIP) for the cleanup of contaminated soils in SSFL Area I LOX and Area II.
- DTSC will continue to review sections of NASA's May 2017 Groundwater Remedial Investigation (RI) Report, June 2017 Human Ecological Risk Assessment and February 2018 Sampling and Analysis Plan for ground water investigations conducted at NASA sites.
- DTSC will review and provide comments on NASA's August 2018 Groundwater CMS Report.
- DTSC will review and provide comments on NASA's September 2019 Slant Boring Workplan for the LOX Area.

DOE

- DOE will revise and submit the Draft Chemical Data Summary Report.
- DTSC will provide comments to DOE on the Draft RCRA RMHF and HWMF Closure Plans and Standard Operating Procedures for Demolition of Facilities in Area IV at the Santa Susana Field Laboratory (SOP).
- DOE and DTSC will continue data evaluation and ground water discussions.
- DTSC will complete review of DOE's 2017 and 2018 Annual Ground water Monitoring Reports (dated March 2018 and 2019).
- DOE will continue GWIM operations, as well as associated data evaluation.
- DOE will submit a revised Corrective Measures Study Report to address DTSC's July 31, 2019 comments.

Boeing

Surficial Media Investigation

- Preparation of the RFI summary reports and Risk Assessments is ongoing for all Boeing sites and subareas. RFI summary reports and risk assessments are being submitted separately. Boeing has submitted all nine Data Summary and Findings Reports for Areas I and III. DTSC anticipates continuing to review of the 1A South, 1B Southeast, 1B North, 1A North, and 1B Southwest RFI DSFRs in August 2019.
- DTSC is reviewing the report on Laboratory Evaluation of Biostimulation to Treat Chlorinated Ethenes in the Chatsworth Formation.
- DTSC is reviewing the Revised SRAM-3 submitted in July 2018.
- DTSC is reviewing the Shooting Range DSFRs submitted in October 2018.

Groundwater

- Faults
 - DTSC is evaluating the concepts presented in the faults technical memorandum within the context of the draft RI Report.
- Boeing ground water characterization work in Area IV
 - DTSC is reviewing the draft report submitted in May 2018.
- Ground water flow model.
 - The ground water flow model continues to be developed.
- Groundwater Report.
 - DTSC is reviewing the Boeing section of the site-wide Groundwater RFI Report submitted in June 2017.

Stormwater Monitoring and Sampling

- To comply with Los Angeles Regional Water Quality Control Board requirements, Boeing will monitor flow and collect samples as needed during rain events.

Feasibility Study / Corrective Measures Study (CMS)

- DTSC is reviewing the CMS report submitted by NASA.

Sitewide Ground water

DTSC is reviewing and commenting on the individual report sections for NASA's specific ground water characterization activities. DTSC has conditionally approved DOE's portion of the report. The individual sections are intended to be part of single sitewide report deliverable that is under development.

Public Outreach

The following Public Participation activities are anticipated in the next 30 days:

- The DTSC SSFL Monthly Update Report for September will be posted online and added to the "What's New" page.
- Public comments on the draft PEIR and draft PMP will continue to be reviewed and responses developed.
- Public comments on the draft Closure Plans will continue to be reviewed and responses developed.
- The Public Participation Plan will be updated to include the outreach process for the draft PEIR, draft PMP, and draft Closure Plans/SOP, community meetings, next steps, and DTSC's outreach strategy moving forward.

General Project Schedule

The current schedule goal is to finalize the PEIR in 2019. When site characterization documents are completed, the next step would be for all three RPs to develop their respective draft cleanup decision documents. Cleanup activities would begin after the cleanup decision documents are made available for public comment, the comments appropriately addressed, and the cleanup decision document finalized.

The departure from the 2017 schedule presented in the Consent Order and referred to in the AOCs is due to the recognized complexity of the project, including the rugged physical nature of the site, multiple responsible parties, and the need to complete several phases of investigation to define the nature and extent of impacted soils. In addition, as described in the Program Management Plan, during the investigation phases, several cleanup actions were taken.

Project cleanup schedules will be further defined in the remediation planning documents and associated designs. The schedules will be provided in the updated Program Management Plan. The cleanup of all chemically and radiologically impacted soils is currently anticipated to take approximately 15 years to completed.

Project Overview

The SSFL is located 30 miles northwest of downtown Los Angeles in southeastern Ventura County, near the crest of the Simi Hills at the western border of the San Fernando Valley. A former rocket engine test and nuclear research facility, the 2,849-acre field laboratory is currently the focus of a comprehensive environmental investigation and cleanup program, conducted by Boeing, DOE, and NASA, and overseen by DTSC. Boeing owns and operates Area IV but DOE is responsible for cleanup of soils in Area IV and the Northern Buffer Zone (NBZ).

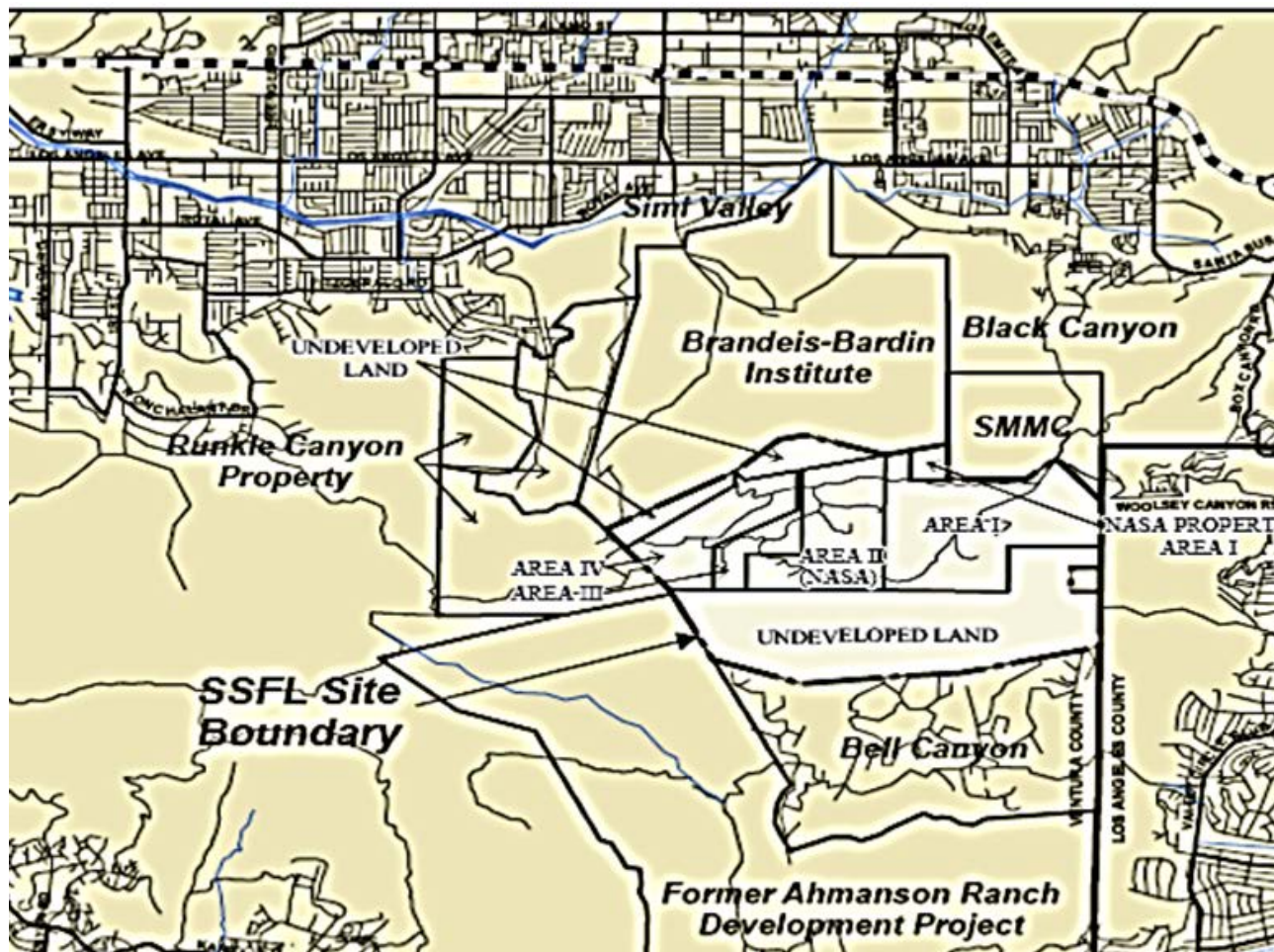


Figure 1 – S S F L and Surrounding Area

DOE

DTSC and DOE participated in chemical soil sampling efforts in Area IV of the SSFL property where former DOE activities occurred on the Site. Area IV is a 290-acre area located in the northwestern section of the site. DOE owns facilities on a 90-acre site within Area IV. Area IV includes the Energy Technology Engineering Center (ETEC) facility where nuclear research, development, and testing began in the 1950s.

The Area IV radiological soil sampling effort, conducted by the US EPA, was completed in 2012. The US EPA approached the investigation by splitting the Area IV and NBZ investigation into historical site assessment (HSA) subareas. The chemical soil sampling efforts followed the same HSA subarea designations. DOE and DTSC participated in Area IV and NBZ co-located soil sampling for chemical contaminants.

DOE completed the chemical soil characterization sampling in 2014. The sampling included three phases, as specified in the December 2010 AOC, signed by DTSC and DOE:

- Phase 1 - Co-located sampling for chemical analysis at US EPA's first phase of radiological sampling locations in Area IV and the NBZ.
- Phase 2 - Sampling at randomly selected sampling locations, and
- Phase 3 - Identify the locations at the Site where insufficient chemical data exists (chemical data gaps) and sample as appropriate.

In 2012, the US EPA, in coordination with DTSC and DOE, completed its second round of sampling efforts to define the nature and extent of radiologic contamination in Area IV. US EPA's round two sampling locations were based upon the validated sampling results they received from their Round 1 sampling. Not all of US EPA's Round 2 sample locations were sampled for chemical contaminants in 2012 and chemical data gap investigation locations may have been required where no radiological sampling was needed. In 2013-2014, the rationale and selection of chemical data gap investigation sampling locations for Area IV were provided, discussed with the community, and implemented. The Area IV chemical data gap sampling is now complete. The radionuclide and chemical results from these investigations are being used for remediation planning. A Draft Chemical Data Summary Report was submitted to DTSC on December 29, 2016. DOE Draft Environmental Impact Statement was issued to the public on January 6, 2017, and the Final Environmental Impact Statement was issued in November 2018.

DOE has completed investigations of ground water source areas at DOE sites in Area IV, with the goal of characterizing the nature and extent of contaminant releases at these areas for ground water remedial planning. DOE's findings are presented in a RCRA Facility Groundwater Remedial Investigation Report for Area IV which is intended for partial completion of the site-wide Groundwater RFI that will be combined with efforts being implemented by Boeing and NASA.

NASA

NASA has concluded chemical data gap investigations of soil and surficial media characterization at the 41.7-acre NASA administered portion of Area I (the former LOX Plant), and 404-acre Area II. NASA Area II was used primarily for rocket engine testing and includes the Alfa, Bravo, Coca, former Delta Test Stands and support structures. Under the terms of the December 2010 AOC, NASA implemented six Field Sampling Plans (FSPs) to complete the AOC soil investigations.

The five NASA surficial media FSPs include:

- FSP-1 - Alfa-Bravo Fuel Farm, Coca-Delta Fuel Farm, Propellant Load Facility
- FSP-2 - Incinerator/Ash Pile/STP, Building 204, Storable Propellant Area (SPA), and Skyline Road
- FSP-3 - Alfa Test Stand, Bravo Test Stand
- FSP-4 - LOX Plant, Area II Landfill, ELV

- FSP-5 - Coca Test Stand, former Delta Stand, R2 Ponds

The sampling proposed in the FSPs is complete, and DTSC is reviewing NASA's draft Data Summary Report for soils characterization work in the NASA areas of the site.

NASA is conducting extensive investigations of five major ground water source areas at Area I LOX Plant and Area II, with the goal of characterizing the nature and extent of contaminant releases at these areas for ground water remedial planning.

Boeing

Boeing owns most of Area I and all of Areas III and IV. Areas I and III total 792 acres and are operated by Boeing. Boeing also owns the 1,143-acre southern buffer zone and 182-acre Northern Buffer Zone (NBZ). Soils in Area IV and the NBZ are being characterized in the DOE portion of the project.

Boeing sites are in Reporting Groups 1A, 1B, 5, 9 and 10. Boeing has reorganized the sites in subgroups identified as Boeing RFI Groups:

- 1A North, 1A Central, 1A South
- 1B North, 1B Southwest, 1B Southeast
- 5/9 North, 5/9 South, and
- Group 10

The proposed sampling is substantially complete, and Boeing has begun submitting data summary reports for DTSC review. Boeing is conducting investigations of groundwater source areas at Boeing sites in Area I and Area III, with the goal of characterizing the nature and extent of contaminant releases at these areas for ground water remedial planning. Additional Information can be found on DTSC's website at: [www.dtsc.ca.gov/SiteCleanup/Santa Susana Field Lab](http://www.dtsc.ca.gov/SiteCleanup/Santa_Susana_Field_Lab).