

NASA's Environmental Remediation Efforts at the Santa Susana Field Laboratory Actions for Response to OIG Recommendation	
Action	Estimated Completion Date
Working with DTSC to establishing appropriate cleanup standards (called Look-up Tables in AOC).	Summer 2013
Follow outcome of SB-990 law suit appeal.	Ongoing; decision expected in 2013
Follow Tribal interest and demands.	Ongoing; TBD
Through the NEPA process, thoroughly evaluating the impacts from a "cleanup to background" and attempting to minimize those impacts.	Spring 2014
Assist DTSC to evaluate impacts to a "cleanup to background" through its CEQA process.	Winter 2015
Seek cost-effective cleanup methods. This will be an ongoing process to examine various technologies.	Winter 2015

Again, thank you for the opportunity to review and comment on the subject draft report. If you have further questions or require additional information on the Agency's response to the subject draft report, please contact Olga M. Dominguez at 202-358-2800 or e-mail olga.m.dominguez@nasa.gov.

Woodrow Whitlow, Jr.

Woodrow Whitlow, Jr.

cc:
Assistant Administrator for Strategic Infrastructure/Ms. Dominguez
Director, Environmental Management Division/Mr. Leatherwood

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Uncontroverted Fact	Boeing Evidence, DTSC Response
	SSFL site should be cleaned up to a stricter standard than would be required under generally applicable State law? MR. ROBINSON: Objection; lack of foundation. THE WITNESS: No.
104. If SB 990 could not be applied to all of the contamination at SSFL, it would not be possible to “sum” the risks for the entire site and to develop “cumulative risk” assessment as required by SB 990.	<ul style="list-style-type: none"> • Not Disputed
105. There is no technical, scientific, or environmental basis to single out SSFL for more onerous cleanup procedures than apply to other contaminated sites in California.	<p><u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> • Malinowski Dep. [28:22] – [29:3] (“Q. Is there anything that you can identify about the SSFL site that poses a more significant threat to public health than other sites in the state? ... [A.] I am not aware of any imminent threat that is posed by SSFL at this point based on the available information I’ve had.”); • <i>Id.</i> at [95:21] – [96:1] (“Q. Does the chemical contamination that is present at SSFL pose a different risk to the public or the environment than the similar chemical contamination found on the other industrial sites in the state? ... [A.]

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Uncontroverted Fact	Boeing Evidence, DTSC Response
	<p>No.”);</p> <ul style="list-style-type: none"> • <i>Id.</i> at [96:2] – [96:11] (“Q. ... Am I correct that there are also other sites in the state that contain radiological contamination? A. Yes. Q. Is there anything about the radiological contamination that is present at SSFL that poses a different risk to the public or the environment than radiological contamination present at other sites in the state of California? A. Not to the best of my knowledge, no.”); • <i>Id.</i> at [136:2] – [136:17] (“Q. ... [I]s there anything about either the chemical or radiological contamination at SSFL that, in your view, would justify applying a different approach to the cleanup at SSFL than at other sites in the state? ... [A.] ... No. Q. ... Is there anything else about the site other than the chemical or radiological contamination, and putting aside SB 990 for the moment, that would, in your view, justify applying a different approach to the cleanup at SSFL than at other sites in the state? ... [A.] No.”); • Brausch Dep. [107:17] – [107:22] (Q. Can you identify any reason to conclude that the SSFL site should be cleaned up to a stricter standard than would be required under generally applicable State law? ... A. ... No.”).

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1 Uncontroverted Fact	2 Boeing Evidence, DTSC Response
	<p>3 <u><i>DTSC Response</i></u></p> <p>4 Disputed.</p> <p>5 <u>Objection:</u> Defendant objects to Statement of Fact</p> <p>6 # 105 in that it mischaracterizes the witnesses’</p> <p>7 testimony cited [above] – the witnesses did not</p> <p>8 testify that there is no technical, scientific or</p> <p>9 environmental basis to single out SSFL for more</p> <p>10 onerous cleanup procedures that apply to other</p> <p>11 contaminated sites in California.</p>
<p>11 106. McClellan Air</p> <p>12 Force Base, roughly the</p> <p>13 same size as SSFL, is</p> <p>14 seven miles from</p> <p>15 Sacramento and is</p> <p>16 contaminated with all of</p> <p>17 the same contaminants</p> <p>18 listed in SB 990, many in</p> <p>19 higher concentrations,</p> <p>20 including TCE.</p>	<p>11 <u><i>Boeing’s Evidence</i></u></p> <ul style="list-style-type: none"> 12 • Malinowski Dep. [26:3] – [26:23] (McClellan 13 Air Force Base close to major population 14 centers); 15 • <i>Id.</i> at [28:7] – [28:9] (“[A.] McClellan Air Force 16 Base was the most polluted Air Force Base out of 17 all the Air Force. It ranked the highest.”); 18 • <i>Id.</i> at [34:9] – [36:16]; 19 • <i>Id.</i> at [101:11] – [102:12]; 20 • <i>Id.</i> at [128:11] – [134:24] (higher concentrations 21 of volatile organic compounds than SSFL); 22 • <i>Id.</i> at [141:11] – [141:16]; 23 • <i>Id.</i> at [144:6] – [148:22] (“... Q. In your view, is 24 the McClellan Air Force Base a fairly similar site 25 to the SSFL site in terms of the contamination 26 that is present? A. The types of contamination, 27 yes. ... Q. There was TCE as well; is that right? 28 A. Yes.);

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Uncontroverted Fact	Boeing Evidence, DTSC Response
	<ul style="list-style-type: none"> • Greger Dep. [68:7] – [68:16]; • Bowers Decl. ¶¶35, 50, 53, 55, 58, 64; • Ex. 6 to Bowers Decl., <i>Public Health Assessment, McClellan Air Force Base, Sacramento, Sacramento, California</i> at 1-5 (Agency for Toxic Substances and Disease Registry 1994); • Ex. 7 to Bowers Decl., <i>McClellan Air Force Base Administrative Record 6504</i> at 2-1 (EPA 2008); • Ex. 8 to Bowers Decl., <i>McClellan Air Force Base (Groundwater Contamination)</i> at 2, 3, 7 (U.S. EPA Region 9); • Ex. 9 to Bowers Decl., <i>Five Year Review; Former McClellan Air Force Base, California, July 2009</i>, at 3-1 (MWH Americas, Inc.); • Ex. 10 to Bowers Decl., <i>Proposed Plan for Soil Cleanup, McClellan AFB Parcel C-6</i> at 3 (EPA October 2008). <p><u>DTSC Response</u></p> <p>Disputed.</p> <p>Objection: Witnesses lack personal knowledge. Comparisons between the amount of contaminants at the SSFL and those detected at other sites in California lacks the necessary foundation (<i>i.e.</i>, a complete characterization of the SSFL site); see State’s. SUF, ¶ 117.</p>

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1 Uncontroverted Fact	Boeing Evidence, DTSC Response
<p>2 107. Lawrence</p> <p>3 Livermore National</p> <p>4 Laboratory, more than</p> <p>5 twice the size of SSFL, is</p> <p>6 48 miles from San</p> <p>7 Francisco and is a DOE</p> <p>8 laboratory used for</p> <p>9 nuclear weapons and other</p> <p>10 research. It is</p> <p>11 contaminated with all of</p> <p>12 the same contaminants</p> <p>13 listed in SB 990. Among</p> <p>14 other things, it has had</p> <p>15 higher historical</p> <p>16 concentrations of TCE and</p> <p>17 tritium than SSFL.</p>	<p><u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> • Malinowski Dep. at [101:11] – [102:12]; • <i>Id.</i> at [163:13] – [163:24] (Lawrence Livermore close to major population centers); • <i>Id.</i> at [169:7] – [175:16] (“Q. Is the list of contaminants at the Lawrence Livermore National Laboratory similar to the list of contaminants of concern at SSFL?... A. Looking both together?... I would say they’re similar, yes.”); • <i>Id.</i> at [173:5] – [173:16] (“Q. [I]s there anything about [Lawrence Livermore National Laboratory] that would support taking a different approach to the cleanup than at SSFL? ... [A.] No.”); • <i>Id.</i> at [175:12] – [175:16] (“Q. Is it fair to say that the principal contaminants of concern at Lawrence Livermore National Laboratory are found in higher concentrations than the same contaminants found at SSFL? A. For those that I am aware of, yes.”); • Bowers Decl. ¶¶32, 39, 48-49, 51-53, 58, 60, 62; • Ex. 4 to Bowers Decl., <i>Site-Wide Record of Decision Lawrence Livermore National Laboratory Site 300</i> at pages 1-1, 2-1, 2-2, 2-4, 2-5, 2-6, 2-8, and 2-9, and Tables 2.5-1, 2.5-2, 2.5-3, 2.5-4, and 2.4-1 (DOE July 2008).

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1 Uncontroverted Fact	2 Boeing Evidence, DTSC Response
	<p>3 <u>DTSC Response</u></p> <p>4 Disputed.</p> <p>5 <u>Objection:</u> Witnesses lack personal knowledge.</p> <p>6 Comparisons between the amount of contaminants</p> <p>7 at the SSFL and those detected at other sites in</p> <p>8 California lacks the necessary foundation (<i>i.e.</i>, a</p> <p>9 complete characterization of the SSFL site); see</p> <p>State’s. SUF, ¶ 117.</p>
<p>10 108. The Pratt &</p> <p>11 Whitney/UTC site is twice</p> <p>12 as large as SSFL and</p> <p>13 located 14 miles south of</p> <p>14 San Jose. It was formerly</p> <p>15 used for the manufacture</p> <p>16 and testing of rocket</p> <p>17 engines, including the</p> <p>18 development,</p> <p>19 manufacturing, and testing</p> <p>20 of solid propellant rocket</p> <p>21 motors and propellants.</p> <p>22 The site has many of the</p> <p>23 same contaminants as</p> <p>24 SSFL and has had higher</p> <p>25 historical concentrations</p> <p>26 of key contaminants,</p> <p>27 including TCE and</p> <p>28 perchlorate.</p>	<p>10 <u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> 11 • Malinowski Dep. at [175:24] – [178:21] (“... Q. 12 Are the principal contaminants of concern that 13 are found at the United Technologies 14 Corporation Pratt & Whitney site higher than the 15 concentrations of the similar contaminants found 16 at SSFL? A. For those that I’m aware of, 17 yes....”); 18 • <i>Id.</i> (“Q. Can you think of any reason to apply a 19 different cleanup process or different cleanup 20 rules at the Pratt & Whitney United Technologies 21 site than at SSFL? A. No.”); 22 • Bowers Decl. ¶¶ 32, 34, 48, 53, 54, 58, 65; 23 • Ex. 1 to Bowers Decl., <i>Revised Human Health</i> 24 <i>and Ecological Risk Assessment Work Plan</i> at 2- 25 1, 4-24 (ARCADIS Aug. 2009); 26 • Ex. 3 to Bowers Decl., <i>Closure Plan – Former</i> 27 <i>Open Burning Facility</i> at 1-15 through 1-17 28 (ARCADIS June 2010);

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Uncontroverted Fact	Boeing Evidence, DTSC Response
	<ul style="list-style-type: none"> Ex. 5 to Bowers Decl., Order No. R2-2004-0032 Revision to Final Site Cleanup Requirements; United Technologies Corporation at 2, 9 (California Regional Water Quality Control Board 2004). <p><u>DTSC Response</u></p> <p>Disputed.</p> <p><u>Objection:</u> Witnesses lack personal knowledge foundation. Comparisons between the amount of contaminants at the SSFL and those detected at other sites in California lacks the necessary foundation (<i>i.e.</i>, a complete characterization of the SSFL site); see State’s. SUF, ¶ 117.</p>
<p>109. SB 990 will result in a substantially more burdensome, time consuming, and expensive cleanup process than that required under generally applicable law, resulting in years of delay in the cleanup schedule, and the unnecessary expenditure of hundreds of millions of additional dollars, which will be allocated between Boeing and the federal</p>	<p><u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> Whipple Decl. ¶¶22–31; Lenox Decl. ¶¶34–36; Bowers Decl. ¶¶71–76; Rutherford Decl. ¶¶48–51; Brausch Dep. [201:19] – [205:17]; Rainey Dep. [38:23] – [39:24]. <p><u>DTSC Response</u></p> <p>Disputed.</p> <p><u>Objection:</u> Defendant objects to Statement of Fact # 109 in that what is “required under generally applicable law” is a conclusion of law. Defendant further objects that the witnesses lack personal knowledge of how much the cleanup will cost, as</p>

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Uncontroverted Fact	Boeing Evidence, DTSC Response
government.	the characterization of the site has not been completed. <i>See</i> State’s. SUF, ¶ 117. Defendant further objects that the expert witnesses cited by Boeing lacked sufficient facts upon which to base their opinion about the cost of the cleanup because the characterization of the site is incomplete.
110. DTSC has made no attempt to determine whether any potential benefit SB 990’s cleanup procedures might have on public health and safety would outweigh the significant potential adverse consequences.	<ul style="list-style-type: none"> • Not Disputed
111. SB 990 will require a substantial amount of additional soil to be removed from the site than under generally applicable law.	<p><u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> • Bowers Decl. ¶¶74–75; • Whipple Decl. ¶¶32–34; • Brausch Dep. [286:5] – [286:24]; • Rainey Dep. [91:2] – [91:17]; • <i>Id.</i> at [108:15] – [109:13]. <p><u>DTSC Response</u></p> <p>Disputed.</p> <p>Objection: Defendant objects to Statement of Fact # 111 in that what is required under “generally applicable law” is a legal conclusion. Defendant further objects that the witnesses lack foundational</p>

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Uncontroverted Fact	Boeing Evidence, DTSC Response
	<p>personal knowledge of how much the cleanup will cost, as the characterization of the site has not been completed. <i>See</i> State’s SUF, ¶ 117. Defendant further objects that the expert witnesses cited by Boeing lacked sufficient facts upon which to base their opinion about the amount of soil to be removed because the characterization of the site is incomplete.</p>
<p>112. Soil removal on a scale necessary to comply with SB 990 would require numerous additional dump-truck round trips through the community, greatly increasing the risk of traffic deaths and illness from pollution by diesel particulates.</p>	<p><u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> • Whipple Decl. ¶¶32–34; • Bowers Decl. ¶¶77–80; • Brausch Dep. [293:15] – [294:17] (“Q. And am I correct that there is some risk to the public associated with additional trucking of soil from a site away from the site? A. Yes. ... Q. ... What is the nature of that risk? A. As I understand it, any time you have vehicular activity on a road, you have some measure of risk associated with accident rates and those sorts of risks that come to bear. Q. Also, diesel particulates? A. Sure. You have emissions from vehicles that travel on the roads.”); • Rainey Dep. [91:2] – [92:23]; [107:10] – [109:10]. <p><u>DTSC Response</u></p> <p>Disputed.</p> <p>Objection: Defendant objects that the witnesses</p>

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Uncontroverted Fact	Boeing Evidence, DTSC Response
	lack foundational personal knowledge of how much the cleanup will cost, as the characterization of the site has not been completed. <i>See</i> State’s SUF, ¶ 117. Defendant further objects that the expert witnesses cited by Boeing lacked sufficient facts upon which to base their opinion about the amount of soil to be removed because the characterization of the site is incomplete.
113. The excavation activities required to comply with SB 990 would destroy considerably more of the existing ecological habitat at SSFL than would otherwise occur.	<p><u>Boeing’s Evidence</u></p> <ul style="list-style-type: none"> • Bowers Decl. ¶74, 75. <p><u>DTSC Response</u></p> <p>Disputed.</p> <p>Objection: Defendant objects that the witnesses lack foundational personal knowledge to testify about the quantification of ecological habitat that will be affected by SB 990’s cleanup standard because it cannot be determined in the absence of a complete site characterization. <i>See</i> State’s SUF, ¶ 117. Defendant further objects that the expert witnesses cited by Boeing lacked sufficient facts upon which to base their opinion about the amount of habitat that might be destroyed because the characterization of the site is incomplete.</p>
114. The method by which contamination is released into the environment at a	<ul style="list-style-type: none"> • Not Disputed

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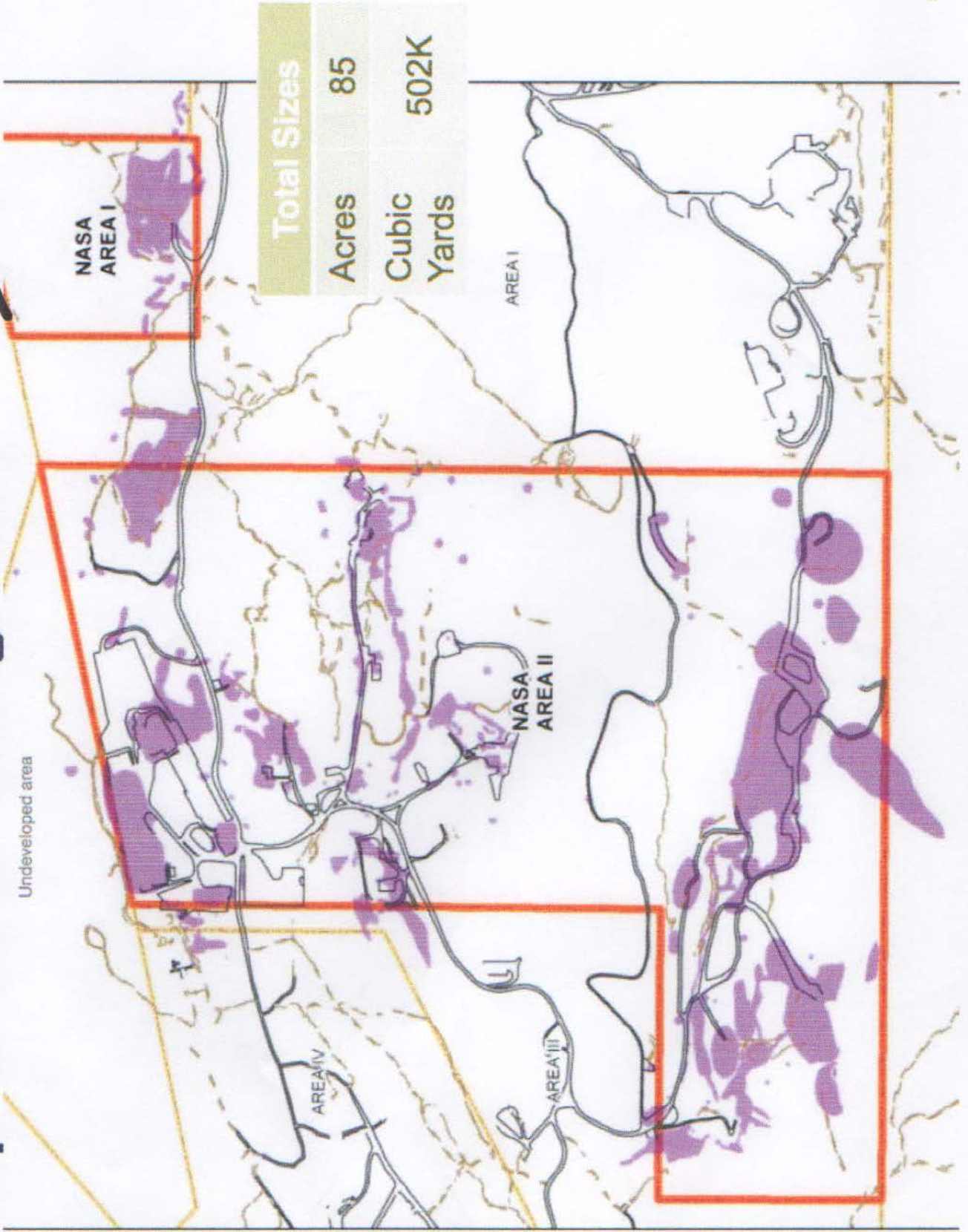
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Uncontroverted Fact	Boeing Evidence, DTSC Response
<p>particular site has no relevance to the appropriate future land- use assumption or the amount of residual contamination that can safely remain at that site at the end of the cleanup.</p>	

Cleanup Areas for Background



\$200 M!



Undeveloped area

NASA AREA I

AREA I

NASA AREA II

AREA IV

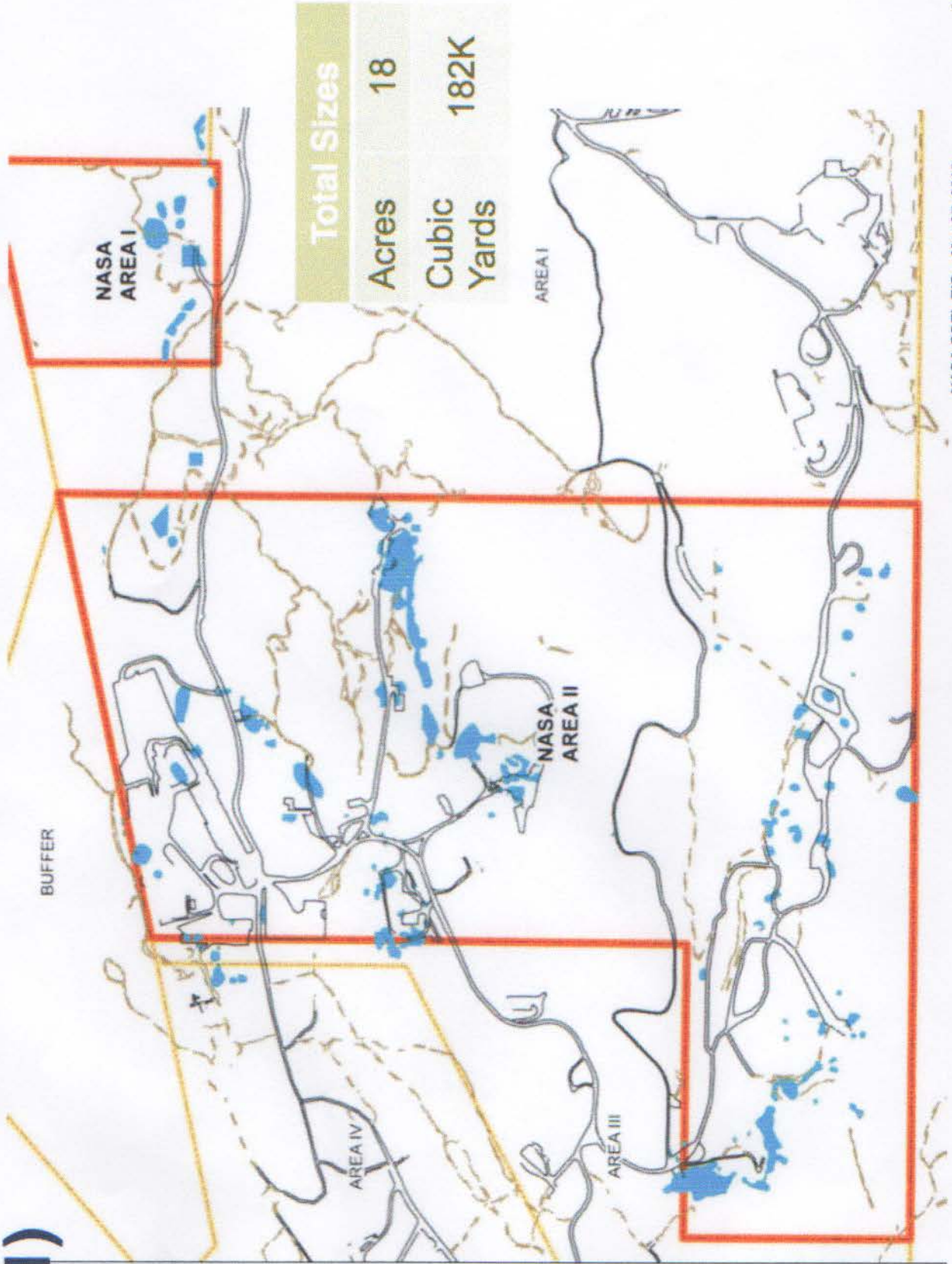
AREA III



\$ 80 m

National Aeronautics and Space Administration

Cleanup Areas for Suburban Residential (Alt 1)

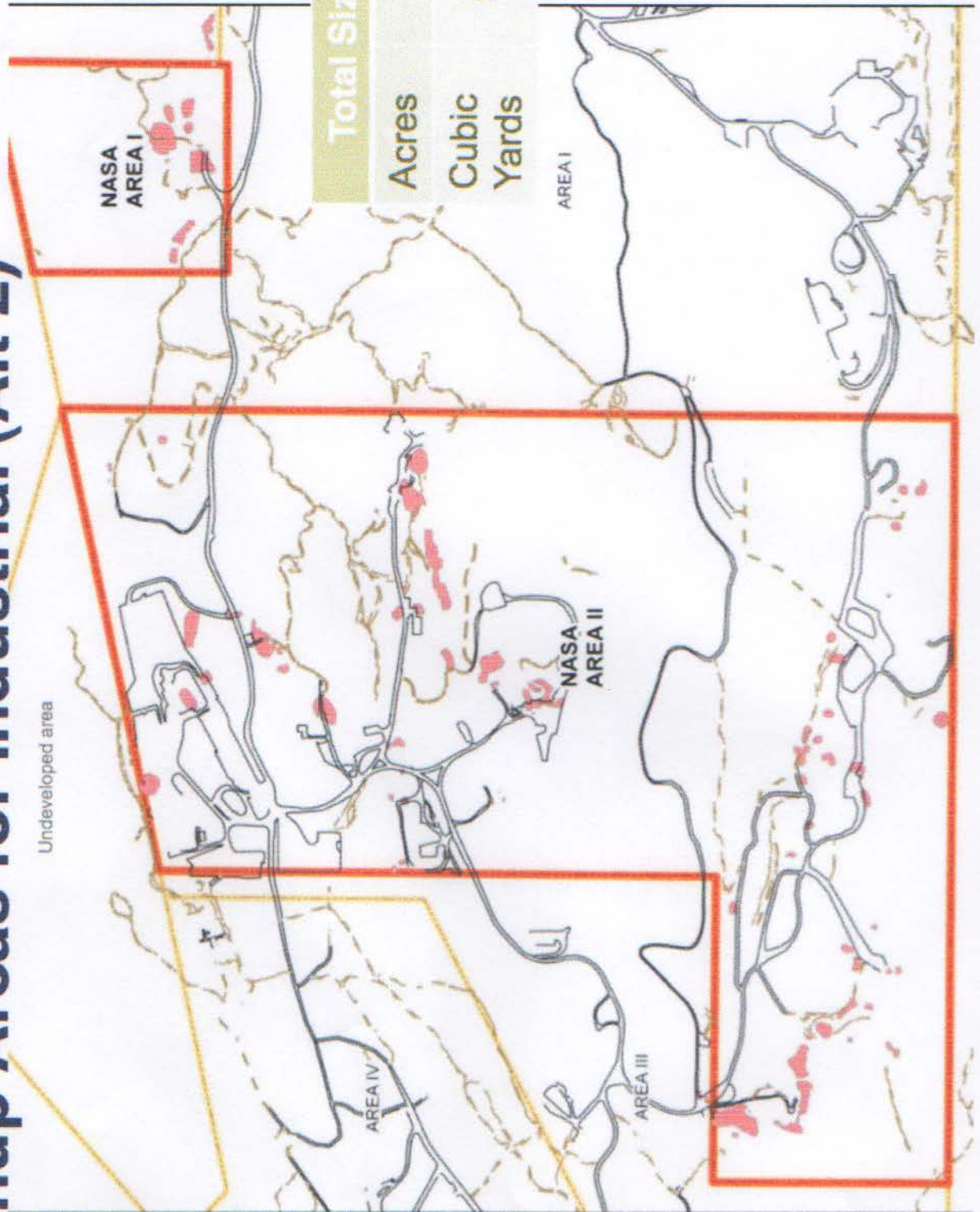




\$ 490 m

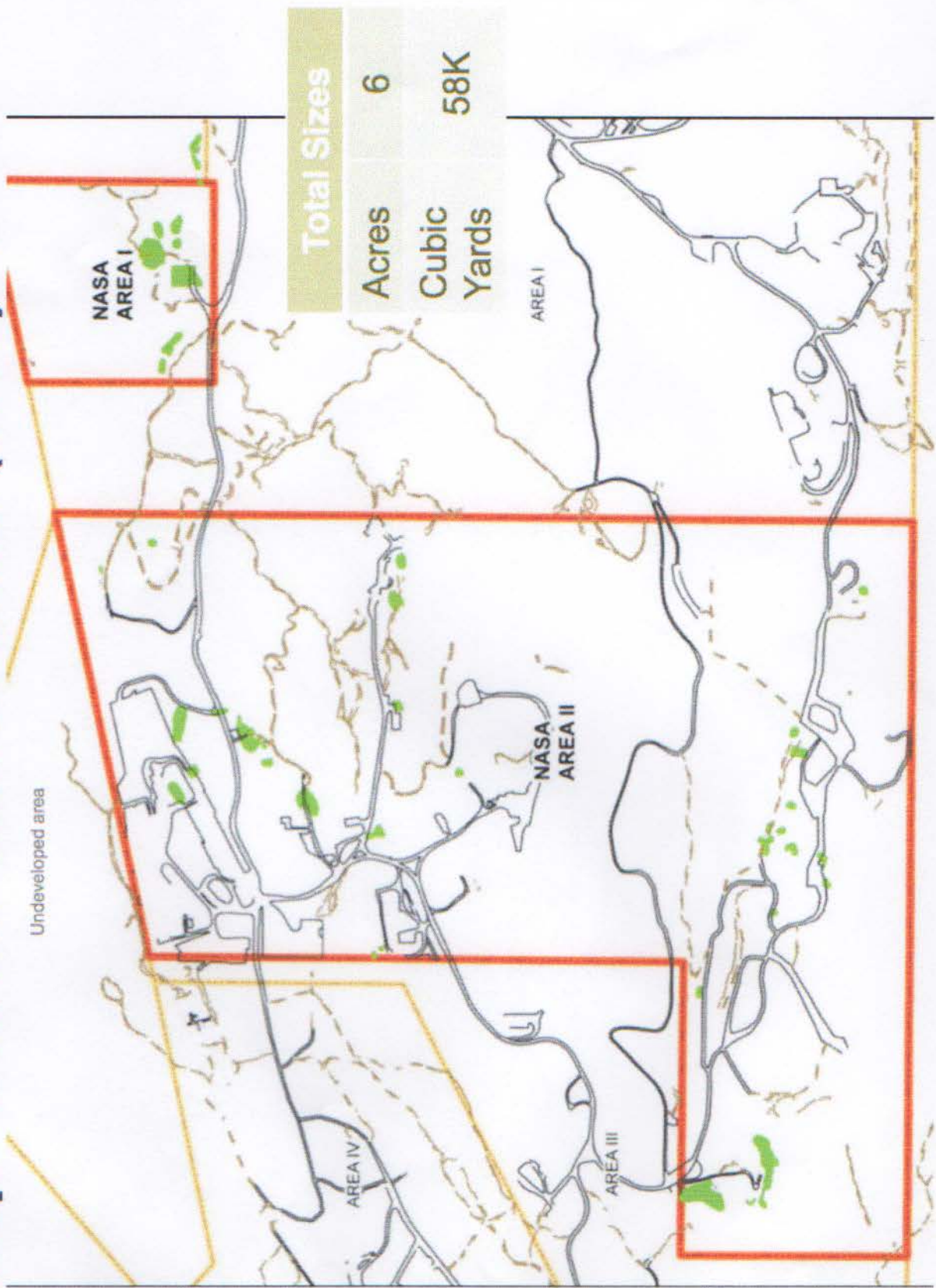
National Aeronautics and Space Administration

Cleanup Areas for Industrial (Alt 2)





Cleanup Area for Recreational (Alt 3) \$25m



cost. For example, the difference in making the site suitable for residential use versus achieving background levels is approximately \$133 million. DTSC officials told us they believe NASA’s cost estimate for achieving background levels is overstated, but NASA officials insist their estimates are based on the effort that would be required to meet the 2017 deadline and the exposure levels the DTSC previously required in the 2007 Consent Order.

Table 2: Cleanup Levels and Associated Soil Removal and Cost Estimates

Cleanup Level	Estimated Amount of Soil to be Removed (cubic yards)	NASA’s Estimated Cost
Background (required under AOC)	502,000	\$209 million
Residential	182,000	\$76 million
Industrial	92,000	\$37 million
Recreational (expected future land use for SSFL)	58,000	\$25 million
No Action	Not Applicable	Not Applicable

Source: NASA presentation to the community surrounding the SSFL.

Interests of Outside Parties Played a Significant Role in NASA’s Cleanup Decision.

Although the NASA Administrator ultimately agreed to the AOC, other NASA officials involved in discussions about the Santa Susana cleanup expressed reservations about the terms of the agreement, with one senior official writing “...be advised that I believe [the AOC] to be inappropriately written and executed and sign it with reservations.” According to NASA officials, input from members of Congress and local California leaders as well as advice from the CEQ played a significant role in the Agency’s decision to agree to the terms of the AOC and in its subsequent decision to exclude clean-up alternatives other than background levels from further consideration in the NEPA process.

NASA, Boeing, and DOE officials told us that political interest in the SSFL cleanup is rooted in a long history of community distrust about the Federal Government’s activities at the site, particularly the nuclear testing and research the Government conducted there in the 1950s. According to DOE officials, a partial meltdown of one of the nuclear reactors at DOE’s portion of the site in 1959 has been a longstanding focus of public attention and suspicion from anti-nuclear groups.²⁶ DTSC officials also cited community distrust as one of the reasons California has taken a particularly aggressive approach to the SSFL cleanup.

As part of the NEPA scoping process, NASA identified five possible alternatives for remediation of the soil at the SSFL site, including cleaning to residential and recreational use standards. However, NASA’s inclusion of the full range of possible clean-up alternatives caused concern among DTSC officials and California political leaders. The

²⁶ In fall 2012, the EPA released preliminary results showing lingering radiological contamination in the DOE-managed portion of the SSFL.

Table 1 shows the various cleanup or remediation levels possible for a site like the SSFL and the underlying assumptions associated with each level.

Table 1: Definition of Cleanup Level

Cleanup Level	Definition (Assumptions for Establishment of Exposure Limits)
Background	Returns the environment to its natural state prior to the introduction of contaminants.
Residential	Assumes that an adult or child could live on the remediated site 24 hours per day, 350 days per year, for 30+ years without adverse health impacts.
Industrial	Assumes workers could remain on the remediated site for 8 to 10 hours per day, 250 days per year over a 25-year period without adverse health impacts.
Recreational	Assumes that an adult or child could be exposed several hours per day for about 50 days per year over a 30-year period without adverse health impacts.

Source: NASA SSFL Fact Sheet

NASA Signed Consent Orders with State of California Governing Remediation at the SSFL. NASA has been involved in cleanup activities at the SSFL since at least the early 1980s. In August 2007, NASA, Boeing, and DOE signed a Consent Order for Corrective Action with the DTSC under which the Agency committed to clean up groundwater and soil in the portions of the SSFL it administers to “residential” exposure levels. According to the Federal district court that heard Boeing’s legal challenge to SB 990, it is undisputed that cleanup to the residential level will fully protect human health and environment. Shortly after this Consent Order was signed, the California legislature enacted California Senate Bill (SB) 990, which imposes a stricter clean-up standard than the Consent Order.

In December 2010, NASA entered into another agreement with DTSC known as the Administrative Order of Consent for Remedial Action (AOC).¹⁶ Under the terms of the AOC, NASA agreed that the 2007 Consent Order would continue to govern its cleanup obligations related to groundwater at Santa Susana (i.e., residential level), but the Agency would be required to clean the soil to the more stringent “background” level. NASA further agreed that soil cleanup at the site would be completed by 2017. According to a press release issued by the California EPA at the time, the AOC “meets the high bar set by Senate Bill 990 which requires the entire SSFL property to be cleaned up to stringent and protective standards, and places the cleanup of both chemical and radioactive contamination under the oversight of DTSC.”

¹⁶ Under California state law, an Administrative Order of Consent is an agreement signed by the DTSC and an individual, business, or other entity through which the violator agrees to take the required corrective actions or to refrain from an activity.

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**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA**

THE BOEING COMPANY,

Plaintiff,

v.

LEONARD ROBINSON, in his official
capacity as the Acting Director of the
California Department of Toxic
Substances Control,

Defendant.

Case No. CV 10-04839-JFW (MANx)

**JUDGMENT PURSUANT TO FED.
R. CIV. P. 54(b)**

The Court having granted Plaintiff The Boeing Company’s Motion for Summary Judgment based on its determination that there were no genuine issues as to any material fact and that Plaintiff was entitled to judgment as a matter of law on Counts One, Two, and Three of the Amended Complaint, IT IS NOW, THEREFORE, HEREBY ORDERED, ADJUDGED, AND DECREED that judgment is entered in this action as follows:

1. Judgment is entered in favor of Plaintiff The Boeing Company as to Counts One, Two, and Three of the Amended Complaint.

2. California Senate Bill 990 (“SB 990”), codified at Cal. Health & Safety Code § 25359.20, is declared invalid and unconstitutional in its entirety under the Supremacy Clause of the United States Constitution.

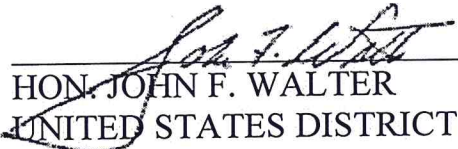
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3. Defendant in his official capacity as Acting Director of the California Department of Toxic Substances Control (“DTSC”) and any successors, as well as any officers, agents, servants, employees, or attorneys acting for or on behalf of DTSC, or persons in active concert or participation with any such person or DTSC, are hereby enjoined from enforcing or implementing SB 990.

4. The Court finds that there is no just reason for delay of the entry of final judgment. In light of this finding, final judgment for Plaintiff is entered pursuant to Rule 54(b) as to Counts One, Two, and Three of the Amended Complaint. Counts Four through Nine of the Amended Complaint, which seek the same relief sought in Counts One, Two, and Three, are stayed pending further order of the Court.

The Clerk is ordered to enter this Judgment.

DATED: May 5, 2011


HON. JOHN F. WALTER
UNITED STATES DISTRICT JUDGE

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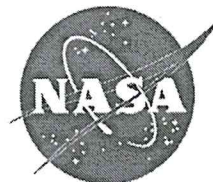
FEBRUARY 14, 2013

AUDIT REPORT

OFFICE OF AUDITS

NASA'S ENVIRONMENTAL REMEDIATION EFFORTS AT THE SANTA SUSANA FIELD LABORATORY

OFFICE OF INSPECTOR GENERAL

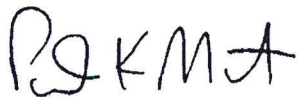


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Acronyms

AOC	Administrative Order of Consent
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
DTSC	California Department of Toxic Substances Control
EIS	Environmental Impact Statement
EMD	Environmental Management Division
EPA	Environmental Protection Agency
FY	Fiscal Year
GSA	General Services Administration
NEPA	National Environmental Policy Act
OIG	Office of Inspector General
RCRA	Resource Conservation and Recovery Act
SB	Senate Bill
SSFL	Santa Susana Field Laboratory
TCE	Trichloroethylene

OVERVIEW

NASA'S ENVIRONMENTAL REMEDIATION EFFORTS AT THE SANTA SUSANA FIELD LABORATORY

The Issue

The Santa Susana Field Laboratory (Santa Susana or SSFL) is located on 2,850 acres in the Simi Hills of Ventura County, California, approximately 30 miles northwest of downtown Los Angeles. First opened in 1948 in what was then a remote area, the facility was for many years the site of research efforts on civilian use of nuclear energy by the Department of Energy (DOE) and rocket testing for defense and space exploration by the United States Air Force (Air Force) and NASA.¹ Over the years, these activities resulted in radiological and chemical contamination of the soil and groundwater at the site.

NASA is responsible for administering 451.2 acres in two areas of the SSFL site, which includes 41.7 acres of Area I and all 409.5 acres of Area II. The Boeing Company (Boeing) owns and operates the remainder of the SSFL, and the DOE leased property in Area IV from Boeing. The Santa Susana site is home to at least 10 species of sensitive plants and at least 5 species of sensitive wildlife, as well as the Burro Flats Painted Cave, which contains pictographs and petroglyphs created by early Native Americans.

For many years, the Santa Susana facility has been the subject of considerable attention from anti-nuclear activists, environmentalists, and the public. From the mid-1950s until the mid-1990s, DOE and its predecessor agencies conducted civilian nuclear research and energy development projects at the SSFL.² A partial meltdown at one of the nuclear facilities in 1959 led to a release of radioactive contaminants.

Although radioactive contamination remains a concern in the DOE portion of the SSFL, the primary contaminant in the NASA-administered areas of the site is trichloroethylene (TCE), a nonflammable, colorless liquid identified as a potential carcinogen. NASA and the Air Force used large quantities of TCE to clean rocket engines, and prior to the early 1960s when catch basins were installed, allowed the substance to run freely onto the ground. While the Air Force was a large contributor to the TCE contamination, NASA – as the current administrator of the property – has assumed responsibility for the cleanup.

¹ The area has become much less remote over time. More than 500,000 people currently live in southern Ventura County, California, where the SSFL is located.

² DOE's predecessor agency was the Atomic Energy Commission.

NASA, like all Federal agencies, is required to comply with laws and regulations that govern cleanup of contaminants left behind from Agency activities.³ Generally, these laws require responsible parties to conduct risk assessments to identify and evaluate the threat that contaminants pose to human health and structure their remediation efforts based on the results of those assessments. One of the principal factors considered in this type of assessment is the reasonably foreseeable use of the affected property, such as agriculture, housing, industry, or recreation. Each scenario assumes future users will be exposed to some amount of residual contamination at the site, with greater assumed exposure requiring a more stringent cleanup standard. The various clean-up levels potentially applicable to a site like the SSFL include background, residential, and recreational.⁴

Boeing has publicly stated that it intends to preserve its portion of the SSFL site – by far the largest section – for use as open space parkland upon completion of cleanup activities. Similarly, NASA officials told us that the anticipated future use of the NASA portion of the SSFL site is for recreation.

NASA has been involved in cleanup activities at the SSFL since at least the early 1980s. In August 2007, NASA, Boeing, and DOE signed consent orders with California’s Department of Toxic Substances Control (DTSC) agreeing to clean up groundwater and soil at the SSFL to residential exposure levels. Shortly thereafter, in October 2007, California Senate Bill No. 990 (SB 990) was enacted. SB 990 applies only to the SSFL and requires that the site be restored to either a “suburban residential” or a “rural residential (agricultural)” level, whichever will produce the lower permissible residual concentration for each contaminant. The legislation specifically prohibits the sale, lease, or other transfer of the property unless DTSC certifies that the land has undergone complete remediation.

In November 2009, Boeing filed a Federal lawsuit challenging SB 990 as violating the U.S. Constitution. In April 2011, a judge in the United States District Court for the Central District of California ruled in Boeing’s favor and declared the law unconstitutional. The State of California appealed that decision and oral arguments are expected before the U.S. Court of Appeals for the Ninth Circuit in early 2013.

In December 2010, NASA entered into a second agreement with the DTSC known as the Administrative Order of Consent for Remedial Action (AOC). Under the terms of the AOC, NASA agreed that the 2007 consent order would continue to govern its cleanup obligations related to groundwater at Santa Susana, but the Agency would be required to

³ The three primary environmental laws are the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4347; the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §9601 et seq.; and the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §6901 et seq.

⁴ Background level means returning the site to its natural state prior to the introduction of contaminants. Residential level assumes that an adult or child could live on the remediated site 24 hours per day, 350 days per year, for 30+ years. Recreational level assumes that an adult or child could be exposed several hours a day for about 50 days per year over a 30-year period without adverse health effects.

return the soil to its original state before any testing activities occurred – referred to in the AOC as “background” levels. NASA further agreed that it would complete soil cleanup to this standard by 2017.

To comply with the 2010 Order, NASA budget requests include proposed funding increases of approximately \$30 million per year from fiscal years (FYs) 2014 through 2017 (an additional \$120 million total for the 4 years). NASA estimates that cleanup costs for Santa Susana to the AOC standard could cost at least \$200 million. In contrast, estimates to clean the site to a standard suitable for residential and recreational use are in the range of \$76 million and \$25 million, respectively. Santa Susana is not the only pending environmental remediation project at NASA. According to Agency environmental management officials, several other projects pose greater risks to human health and the environment than Santa Susana.

The AOC includes a provision for NASA to follow the National Environmental Policy Act (NEPA), which requires the Agency to complete an Environmental Impact Statement (EIS) for its cleanup activities at Santa Susana.⁵ As part of this process, NASA initially identified five possible alternatives for remediation of the site, including cleaning to residential and recreational use standards. However, NASA’s inclusion of alternatives other than cleanup to background levels caused concern among DTSC officials and California political leaders.

In May 2012, DTSC sent a letter to the NASA Administrator to request that “NASA modify its...process to align itself with...a cleanup of the site to background levels...in compliance with the AOC” rather than evaluate less stringent cleanup alternatives. In addition, Senator Barbara Boxer from California asked the Council on Environmental Quality (CEQ), a White House office that coordinates Federal environmental efforts and works closely with agencies in the development of environmental policies, whether NASA was legally required to consider cleanup options other than background level. After the CEQ advised the Senator that there was no such requirement, NASA limited its EIS process to consideration of only one cleanup standard – background levels.

Given the high cost of the SSFL cleanup and the unusual legal underpinnings of the AOC, we examined whether NASA’s plans to clean up environmental contamination at Santa Susana conform with the laws and standards that generally govern such remediation efforts and provide the best value to the taxpayer. Details of the audit’s scope and methodology are in Appendix A.

Results

NASA has agreed to clean its portion of the Santa Susana site to a level that exceeds the generally accepted standard necessary to protect human health in light of the expected

⁵ An EIS is a detailed evaluation of the Agency’s proposed action and possible alternatives. The public, other Federal agencies, and outside parties may provide input into development of an EIS and are afforded an opportunity to comment on the resulting draft EIS.

future use of the site. Moreover, the cleanup is likely to cost the taxpayers significantly more than the cleanup effort NASA agreed to in its 2007 Consent Order with the State of California – a remediation level itself that was more stringent than what would be required based on the expected use of the site. Although the precise outlines of the cleanup effort and therefore its ultimate cost have not been finalized, NASA estimates that cleaning the SSFL to background levels could cost more than \$200 million, or more than twice the cost to clean it to residential levels and more than eight times the cost to clean it to a recreational use standard. In addition, because cleanup to background levels may require highly invasive soil removal, there is a risk that such a cleanup would result in significant damage to the surrounding environment and to archeological, historical, and natural resources at the site.

Management Action

We recommend that the Administrator, with the assistance of the Associate Administrator for Mission Support, reexamine the Agency’s current plans for cleaning the NASA-administered portion of the Santa Susana site and ensure that its environmental remediation is conducted in the most cost-effective manner in keeping with the expected future use of the property.

In accordance with our usual practice, we provided NASA with a draft of this report and requested the Agency respond to our recommendation. Typically, the Agency indicates whether it concurs with our recommendation and describes any corrective actions it plans to undertake to meet the intent of the recommendation. However, in this case NASA declined to indicate whether it agreed or disagreed with our recommendation.

Rather, after noting that NASA “fully appreciates” our recommendation, the Associate Administrator stated that the Agency will continue to work with the DTSC and local community stakeholders “within the requirements” of the AOC and at the same time will “make every effort to implement a [cleanup] program that will achieve both cost avoidance and protection of cultural and natural resources.” In addition, the Associate Administrator noted several recent developments that may affect how the AOC is interpreted and implemented. (See Appendix F for Management’s Response).

Although we are encouraged by NASA’s pledge to work toward a cleanup that achieves cost avoidance and preserves cultural and natural resources, it is not clear that the Agency can achieve the most appropriate and cost-effective remediation effort given the constraints of the current AOC. Accordingly, our recommendation remains unresolved and we will continue to monitor the Agency’s efforts to clean the Santa Susana site.

NASA COMMITTED TO AN EXCESSIVE AND UNNECESSARILY COSTLY CLEANUP

NASA has agreed to clean its portion of the Santa Susana site to a level that exceeds the generally accepted standard necessary to protect human health in light of the expected future use of the site. Moreover, the cleanup is likely to cost taxpayers significantly more than the cleanup effort NASA agreed to in its 2007 Consent Order with the State of California – a remediation level that was more stringent than what would be required based on the expected use of the site. Although the precise outlines of the cleanup effort and therefore its ultimate cost have not been finalized, NASA estimates that the cost to clean the soil to background levels could exceed more than \$200 million. This is more than twice the cost to clean the site to residential levels and more than eight times the approximately \$25 million NASA estimates it would cost to clean the site to a recreational use standard.²⁵ In addition, because cleanup to background levels may require highly invasive soil removal, there is a greater risk that such a cleanup may result in significant damage to the surrounding environment as well as to archeological, historical, and natural resources at the site.

NASA's Remediation Plan Commits the Agency to a Cleanup Standard Not Based on Risk to Health. Environmental cleanup standards generally are set after measuring the risks to human health in light of the expected future use of the property. While Boeing is cleaning its portion of the SSFL site – by far the largest section – to residential cleanup standards, it has publicly stated that it intends to preserve the site for use as open space parkland upon completion of its cleanup activities. Although final disposition of the NASA-administered portions of the SSFL lies with the GSA, NASA officials said they also expect the Agency's portion will ultimately be used for recreation. According to NASA, DOE, and EPA officials and in light of this expected land use, a normal NEPA process – where the full range of alternatives would be identified and evaluated prior to deciding on the course of action – would likely have led to a decision to clean the area to a less stringent standard than background levels. Although California officials have not yet established the specific criteria necessary for NASA to achieve background levels for the various contaminants at the site, these levels are expected to approximate the natural concentrations that would have been found in the soil prior to any rocket testing activities.

Less Costly Cleanup Alternatives Exist. NASA estimates potential costs of more than \$200 million to clean its portion of the SSFL site to background levels to meet the terms of the AOC. This compares to \$76 million to make the site appropriate for residential use and \$25 million for recreational use. As shown in Table 2, the possible scenarios for NASA's remediation efforts at the SSFL site vary considerably in effort required and in

²⁵ The estimates above are for the soil cleanup at SSFL based on the 2010 AOC. They do not include the cost of groundwater cleanup, which is still governed by the 2007 agreement.