



BRIDGING THE GAP BETWEEN
NUCLEAR DANGERS & A SAFE,
SUSTAINABLE FUTURE

Board of Directors

Daniel Hirsch, President
Susan Clark, Board Chair
Dr. Sheldon C. Plotkin, Secretary
Reverend H. Mike Fink
Pauline Saxon

July 16, 2009

Chair Lutz & Board Members
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, CA 90013

Request for Reconsideration & Related Matters (SSFL)

Dear Chair Lutz and Board Members:

On May 8, after a series of reversals of votes, a split Board voted to allow Boeing to exceed numeric pollution limits at Outfalls 8 and 9 for another year without triggering Notices of Violation or the issuance of fines.

Important to this decision was the repeated assertion made—*under oath* – by Boeing counsel Peter Weiner that Boeings violations of its NPDES pollution discharge permit were in effect due to what he said was the refusal of the California Department of Toxic Substances Control (DTSC) to allow Boeing to undertake any interim removals of contaminated soil. The record indicates that several members of the Board appeared to believe this claim and it influenced their vote to give Boeing further waiver from enforceable numerical pollution limits.

However, on June 12, the Acting Director of DTSC wrote to you to inform you that the statements made by Mr. Weiner are not accurate. Additional information, discussed below, further demonstrates that the Weiner statements were false.

Thus, the controversial May decision by this Board was influenced – and tainted – by apparent material false statements made under oath by Boeing counsel.

We ask therefore that the Board (1) reconsider the May decision, and (2) investigate whether material false statements under oath were in fact made by Mr. Weiner and take appropriate action based thereon.

1. THE WEINER STATEMENTS UNDER OATH

After being sworn (TR p.3), Mr. Weiner testified as follows (TR p. 121) that DTSC had forbidden Boeing from undertaking any soil removal actions:

Peter Weiner: "And, Ms. Diamond, just to clarify, but for the Board's 13304 order, **we have been hamstrung in terms of taking removal action, because DTSC said, "No, you're not going to do anything until we've done all of our investigations and we're ready to say yes."** And it was cutting the Gordian knot by issuing the 13304 order that intervened and allowed us and allowed you to get source removal. **Otherwise, we weren't allowed to do it by DTSC."** (emphasis added)

This was not a single assertion. At p. 240, Mr. Weiner testifies again as follows:

Weiner: "We have welcomed the 13304 order. We could have appealed it. We didn't. And we didn't because we think it's the right thing to do. We think it's right to finally dig up some of the dirt. **We've been stopped from doing that by DTSC.**

This Board came forth and issued us an order to do so, **but to be blunt, we couldn't have done it voluntarily, because DTSC wouldn't have let us."** (emphasis added)

The relevant transcript pages are attached hereto.

2. EVIDENCE THAT THESE STATEMENTS ARE FALSE

A. The Acting Director of DTSC Says They Are False

Acting DTSC Director Maziar Movassaghi took the extraordinary step of writing to the Board Chair and Members on June 12 (copy attached) stating that the Weiner testimony that DTSC had refused to permit any soil removals at SSFL and that without the Regional Board's recent order, removals for Outfalls 8 and 9 would have been impossible, was not only untrue but "offensive." Director Movassaghi states:

In fact, Boeing has never asked for DTSC's approval to undertake the removals contemplated by the RWQCB, and DTSC has *never* prevented Boeing or its partners at the SSFL from undertaking removal actions as a way to address immediate and pressing problems at the site.

Since 1999 DTSC has approved and overseen six (6) different interim removal actions at the SSFL

(emphasis in original)

Acting Director Movassaghi then proceeds in a footnote to list the six interim removal actions that have been undertaken at SSFL with DTSC approval and oversight:

(1) 1999-2000, Happy Valley, removal of 1,600 cubic yards (cy) of soil and debris from drainage containing metals and perchlorate, and geophysical surveys in support of ordnance investigation. (2) 2000, Former Sodium Disposal Facility, over 20,000 cy of material excavated to remove elevated concentrations of dioxins, PCBs, and mercury. (3)

2003-2004, Happy Valley, 8,500 cy of perchlorate contaminated soils and surficial weathered bedrock removed primarily from the southern drainage area. (4) 2004, Building 203, removal of approximately 3,000 cy of mercury-contaminated soils to prevent migration downslope. (5) 2007, Sage Ranch, removal of approximately 1,500 cubic yards of antimony and asbestos-contaminated soil and other debris from the northern drainage near for [sic] former LOX plant, (6) 2008, Sage Ranch, removal of approximately 9,000 cubic yards of soil and debris from the northern drainage and former shooting range site.

Note that in addition to demonstrating that Mr. Weiner's testimony that DTSC had blocked all removals is false, several of the removals were in fact in the watersheds for Outfalls 8 and 9, the two outfalls for which Boeing was requesting the Board waive enforceable limits.

Thus, Acting DTSC Director Movassaghi states (a) that Boeing never even asked DTSC for permission to undertake the specific removals under consideration by the Board and was never denied permission, contradicting Mr. Weiner's claim that were it not for the Board's soil removal order, Boeing could not have undertaken the removals in question because DTSC was blocking the removal; (b) that DTSC had never blocked Boeing from undertaking interim removals needed to address pressing problems at the site; and (c) DTSC had approved all such requests for interim removals, and in fact six such removals had been undertaken. The most authoritative source possible—the man in charge of DTSC—has gone out of his way to inform this Board that the Weiner statements were false.

B. The Board's Executive Officer Concedes that the Record Before the Board Demonstrates that the Weiner Statements Were False

In a June 16, 2009, reply letter to DTSC (also attached), Executive Officer Tracy Egoscue admits that the Weiner testimony under oath was false and that the record of that proceeding so demonstrates. Ms. Egoscue states that the LA Water Board staff and DTSC staff have worked

...in close cooperate for many years to ensure that human health and the environment are protected both onsite and downstream of the site. *This relationship has resulted in a number of interim removal actions onsite that have addressed historical exceedances of effluent limitations included in our National Pollutant Discharge Elimination System (NPDES) permits. The Fact Sheet considered by the Los Angeles Water Board on May 8, 2009 included several references to DTSC's involvement in site assessment and cleanup, including interim actions to address soil concentrations of perchlorate and mercury that was contributing to exceedances of effluent limits in our NPDES permits.*

(emphasis added)

We will discuss Ms. Egoscue's extraordinary letter to DTSC in more detail later, but what is important here is that it concedes that the Weiner sworn testimony was false.

C. Boeing's Feasibility Study Work Plan's "Summary of Interim Measures" Further Demonstrates that Boeing's Board Testimony Was False

Also contradicting Mr. Weiner's claim that Boeing has been stopped by DTSC from doing any interim soil removals is Boeing's own submission to DTSC of April 21, 2009, "Feasibility Study Work Plan,"

which has an entire appendix detailing the interim removals Boeing has done to date -- all with DTSC OK. See Appendix B ("Summary of SSFL Interim Measures") in the Feasibility Study Work Plan (pp166-198 of the file), available on the DTSC website at http://www.dtsc-ssfl.com/files/lib_feasibilitystudy/feasibilitystudywork/Feasibility Study Work Plan April 2009.pdf and included here as an attachment.

The first page of text is captioned "Interim Measure and Removal Action Programs" and states in its very first sentences:

"This appendix to the Feasibility Study (FS) Work Plan summarizes interim measures (IMs) for both the Surficial Media and Chatsworth Formation Operable Units that have been conducted at the Santa Susana Field Laboratory (SSFL). **These IMs were overseen by the California Department of Toxic Substances Control**, the regulatory agency responsible for the Resource Conservation and Recovery Act (RCRA) Corrective Action Program at the SSFL." (emphasis added) The document goes on to describe in some detail approximately five interim removals at the site, approved by DTSC.

Note that one of these interim removals was for perchlorate soil contamination in the "Happy Valley" area of SSFL near Outfall 8 (leading into Dayton Canyon) and another for removal of asbestos, PAHs, lead, and perchlorate-containing materials in the watershed and drainage associated with Outfall 9.

The transmittal letter for the FS Work Plan was signed by Boeing's Thomas Gallacher, below the following paragraph:

"I certify under penalty of law that this documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Thus, a few weeks before Mr. Weiner's testimony under oath on behalf of Boeing to the Regional Water Board that DTSC had supposedly blocked Boeing from undertaking any interim removal actions, Boeing had submitted to DTSC, also under oath, a report listing numerous interim measures and removal actions that had in fact been undertaken at SSFL, including near Outfall 8, all with DTSC approval. The man who had transmitted that report to DTSC, Boeing's Thomas Gallacher, testified with and stood right next to Mr. Weiner when the two testified before the Water Board, and despite the opportunity to correct the statements made by Mr. Weiner, did not do so.

D. The May 29, 2009, Tour of SSFL by EO Egoscue and Board Vice-Chair Glickfield Further Demonstrated that the Weiner Testimony Was False

On May 29, Boeing provided a tour of the Santa Susana Field Lab for Cal-EPA Secretary Linda Adams, DTSC Acting Director Movassaghi, Senator Fran Pavley, Assemblymember Julia Brownley, former Senator Sheila Kuehl, and others. Ms. Egoscue and Ms. Glickfield attended on behalf of the Board.

During that tour, participants were taken to the Outfall 8 area and shown the area where Boeing had completed, with DTSC approval, an interim source removal of perchlorate-contaminated soils. They

were also shown where the recent interim removal of contaminated soils had occurred in the Outfall 9 area.

3. THE FALSE STATEMENTS WERE MATERIAL AND HAD THE POTENTIAL TO INFLUENCE THE BOARD'S DECISION

Mr. Weiner, on behalf of Boeing, in essence asserted that Boeing should be granted the additional waiver on fines and Notices of Violation for exceedances at Outfalls 8 and 9 because such exceedances were not Boeing's fault but due to DTSC's alleged refusal to approve any requested interim soil removals at SSFL. Not only was this not true generally at the site, as demonstrated above, but DTSC had in fact approved interim soil removals in the past for both outfalls in question. Indeed, Boeing boasted on the tour (*after* gaining Board approval for the waiver) that perchlorate exceedances at Outfall 8 had ceased because of the interim soil removal action undertaken with DTSC approval.

The Weiner claim was a powerful argument in support of relief from enforcement action by the Board. If the exceedances were not due to failure of Boeing to take appropriate actions, but instead Boeing had done everything it could to prevent such violations and they were occurring only because DTSC refused to permit any interim removals of contaminated soil that was causing the exceedances, then a reasonable person could conceivably agree to provide the relief requested. However, if Boeing were lying in sworn testimony about this matter and the Board became aware of the false testimony, the results might be quite different.

That the testimony was influential with several Board members who voted to grant Boeing the requested relief is demonstrated in the record. Several Board members clearly believed the testimony and were influenced by it, repeating several times that Boeing had been stymied by actions of DTSC and even going so far as to urge Board staff to assist Boeing in overcoming obstacles purportedly placed by DTSC.

4. THE EGOSCUE REFUSAL TO PERMIT THE BOARD TO CONSIDER THE DTSC ACTING DIRECTOR'S LETTER AND DECIDE WHETHER TO REVISIT ITS APPROVAL OF THE BOEING RELIEF

In her letter to DTSC Acting Director Movassaghi, refuses to allow the Board to decide whether it wishes to reconsider its decision based on the disclosure that the Weiner testimony was false. Indeed, she refuses to even permit the DTSC letter to be included in the record.

Board Executive Office Egoscue makes the extraordinary argument that although the Weiner testimony was false, all of the Board members knew when they were voting that it was in fact false. There is no basis in the record whatsoever to support that claim; indeed, the record seems to demonstrate only the opposite, that Board members who voted to grant the relief requested believed the claim and were influenced by it. At minimum, one should ask each Board member in public session whether they knew when they were voting that the Boeing testimony was false.

But if one were to assume that Ms. Egoscue were correct and all the Board members knew, this would mean that the Board voted to grant Boeing the requested relief even knowing that its testimony under oath was false—and, so knowing, took no action about it. This would in itself be grounds for overturning any such decision. Can Ms. Egoscue really be asserting that all Board members knew that sworn testimony by its permittee was false, and not only did nothing about that, but rewarded the permittee?

It should be up to this Board to decide whether to consider the DTSC letter and related

information about the Weiner testimony, and whether to revisit its decision accordingly.

5. REQUESTS TO THE BOARD

We respectfully request that the Board:

(1) Have each Board Member, on the record, state whether she or he knew, at the time he or she voted on May 9, that the statements made by Boeing counsel Weiner under oath in testimony on that day were false, as Ms. Egoscue claims.

(2) Accept this letter and its attachments, including the DTSC June 12 letter, into the record, and reconsider its May 9 decision.

(3) Investigate whether the Weiner statements under oath were false, and if so concluded, take necessary actions against Mr. Weiner. If the Board determines it does not have authority to enforce its own oath, it should refer the matter to other entities who can take appropriate action.

At least two of the Board Members who voted to grant Boeing relief from enforceable limits did so saying they were doing so based on trusting Boeing and that if anything subsequently occurred to cause them to believe that that trust was misplaced, there would be significant consequences to Boeing. (see, e.g., statements by Board Chairperson Lutz and Vice Chairperson Glickfield at TR. p. 262-263). The Board now has clear evidence suggesting that that trust was in fact based on false statements under oath. If the Board does nothing in the face of this evidence—including from the head of a sister agency – it will permanently erode the Board’s authority and public confidence in it. We hope the Board will act appropriately in the face of these revelations.

Respectfully submitted,

Daniel Hirsch
President

attachments: as stated

MEETING
STATE OF CALIFORNIA
LOS ANGELES
REGIONAL WATER QUALITY CONTROL BOARD

VENTURA COUNTY GOVERNMENT CENTER
800 SOUTH VICTORIA AVENUE
HEARING ROOM
VENTURA, CALIFORNIA

FRIDAY, MAY 8, 2009

9:03 A.M.

JAMES F. PETERS, CSR, RPR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

1 Lenox is the project manager for the Interim Source
2 Removal Action. His team put together the workplan. We
3 have to defer to NASA, remember, because part of this is
4 on their property.

5 Art, we expect to start removing soil regarding
6 the source removal --

7 MR. LENOX: This summer.

8 MR. GALLAGHER: This summer.

9 BOARD MEMBER DIAMOND: Okay.

10 MR. WEINER: And, Ms. Diamond, just to clarify,
11 but for the Board's 13304 order, we have been hamstrung in
12 terms of taking removal action, because DTSC said, "No,
13 you're not going to do anything until we've done all of
14 our investigations and we're ready to say yes."

15 And it was cutting the Gordian knot by issuing
16 the 13304 order that intervened and allowed us and allowed
17 you to get source removal. Otherwise, we weren't allowed
18 to do it by DTSC.

19 BOARD MEMBER DIAMOND: Okay. Well, again, I
20 thank you for the answers to those questions. I don't
21 want to take up all of the time. I know my fellow board
22 members have other questions. Thank you. And I'm sure
23 they'll call you up as well.

24 I'm just going to move on and just finish -- I'm
25 finished with my questions, but I believe that where we

1 Boeing come up and make some comments to us just very
2 quickly, two minutes; that Mr. Hirsch make a comment to
3 us, two minutes; and then either Heal the Bay or
4 Assemblymember Brownley, if you want to decide which one
5 of you, we'll give one of you an opportunity as well.

6 Please state your name so our reporter knows whom
7 is speaking to us.

8 MR. WEINER: Do you want Boeing first?

9 CHAIRPERSON LUTZ: Yes, we'll start with Boeing.

10 MR. WEINER: Okay. I'm Peter Weiner for Boeing,
11 and Tom Gallagher for Boeing as well.

12 I'm not sure what you want comments on, first of
13 all, but if it's on the two motions or the various motions
14 that have failed, that are at a 3-3, we're committed to
15 cleaning up the site. We have welcomed the 13304 order.
16 We could have appealed it. We didn't. And we didn't
17 because we think it's the right thing to do. We think
18 it's right to finally dig up some of the dirt. We've been
19 stopped from doing that by DTSC.

20 This Board came forth and issued us an order to
21 do so, but to be blunt, we couldn't have done it
22 voluntarily, because DTSC wouldn't have let us. We needed
23 to have an order. It's not that we asked for it, but we
24 welcomed it, and we embraced it. And we are trying our
25 darnedest to comply with it and do it in a robust way.



Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control



Arnold Schwarzenegger
Governor

Maziar Movassaghi
Acting Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

June 12, 2009

Ms. Mary Ann Lutz, Chair
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Dear Chair Lutz:

As you know, the Department of Toxic Substances Control (DTSC) is the lead agency overseeing the investigation and cleanup of the Santa Susana Field Laboratory (SSFL). We are writing to correct the record regarding comments made at the May 8, 2009, the Los Angeles Regional Water Quality Control Board (RWQCB) public meeting.

During the board item for the "Waste Discharge Requirement and Proposed Cease and Desist Order for the Boeing Company, Santa Susana Field Laboratory", testimony was provided by a representative of The Boeing Company (Boeing) who alleged Boeing had been "hamstrung in terms of taking removal action, because DTSC said, 'No, you're not going to do anything until we've done all of our investigations and we're ready to say yes.' And it was cutting the Gordian knot by issuing the 13304 order that intervened and allowed us and allowed you to get source removal. Otherwise, we weren't allowed to do it by DTSC."¹ The RWQCB also heard from the representative of Boeing that "[Boeing] welcomed the 13304 order. We could have appealed it. We didn't. And we didn't because we think it's the right thing to do. We think it's right to finally dig up some of the dirt. We've been stopped from doing that by DTSC. This Board came forth and issued us an order to do so, but to be blunt, we couldn't have done it voluntarily, because DTSC wouldn't have let us."²

The remarks alleging DTSC was an impediment to progress at the site were not only inaccurate, but are also offensive. In fact, Boeing has never asked for DTSC's approval to undertake the removals contemplated by the RWQCB, and DTSC has *never*

¹ Page 121, lines 11 through 18 of the May 8, 2009 meeting transcript prepared by James F. Peters, CSR, RPR, Certified Shorthand Reporter, License Number 10063

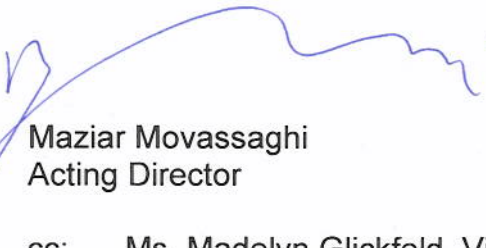
² Page 240, lines 15 through 22 of the aforementioned transcript.

prevented Boeing or its partners at the SSFL from undertaking removal actions at the SSFL. To the contrary, DTSC has strongly supported removal actions as a way to address immediate and pressing problems at the site.

Since 1999 DTSC has approved and overseen six (6) different interim removal actions at the SSFL,³ and it is ready to work with the RWQCB and Boeing to implement the interim source removals contemplated by the RWQCB's 13304 order (i.e., cleanup and abatement order). DTSC fully supports the RWQCB cleanup and abatement order. Boeing is fully aware of the facts in this matter, and we hope that the Company will issue a retraction and correction of the misleading testimony provided to the RWQCB.

DTSC has worked, and will continue to work in close cooperation with the RWQCB on this and other matters to address the cleanup at the SSFL. We are in the process of finalizing a revised order for this site to fully implement the requirements of SB 990 (Kuehl, 2007). My staff will ensure that the RWQCB is aware of the revised order and ask for comments during our public comment period. The complexity of contamination constituents and the natural environment at SSFL require our departments to work in a cooperative fashion to protect the health and safety of citizens living near this site. If you have any questions regarding the above, please contact me at (916) 322-0504.

Sincerely,



Maziar Movassaghi
Acting Director

cc: Ms. Madelyn Glickfeld, Vice Chair
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

³ (1) 1999-2000, Happy Valley, removal of 1,600 cubic yards (cy) of soil and debris from drainage containing metals and perchlorate, and geophysical surveys in support of ordnance investigation. (2) 2000, Former Sodium Disposal Facility, over 20,000 cy of material excavated to remove elevated concentrations of dioxins, PCBs, and mercury. (3) 2003-2004, Happy Valley, 8,500 cy of perchlorate contaminated soils and surficial weathered bedrock removed primarily from the southern drainage area. (4) 2004, Building 203, removal of approximately 3,000 cy mercury-contaminated soils to prevent migration downslope. (5) 2007, Sage Ranch, removal of approximately 1,500 cubic yards of antimony and asbestos-contaminated soil and other debris from the northern drainage near former LOX plant. (6) 2008, Sage Ranch, removal of approximately 9,000 cubic yards of soil and debris from northern drainage and former shooting range site.

cc: Mr. Steve Blois, Board Member
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Ms. Francine Diamond, Board Member
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Ms. Maribel Marin, Board Member
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Ms. Maria Mehranian, Board Member
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Mr. F.W. "Dick" Anderson, Board Member
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Ms. Tracy Egoscue, Executive Officer
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Ms. Mary Armstrong
Vice President, of Environment, Health and Safety
The Boeing Company
100 North Riverside
Chicago, Illinois 60606



California Regional Water Quality Control Board

Los Angeles Region



Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Linda S. Adams
Agency Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.waterboards.ca.gov/losangeles>

Arnold Schwarzenegger
Governor

June 16, 2009

HAND DELIVERED

Mr. Maziar Movassaghi
Acting Director
Department of Toxic Substances Control
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

RESPONSE TO JUNE 12, 2009 LETTER CONCERNING MAY 8, 2009 NPDES PERMIT HEARING FOR THE BOEING COMPANY, SANTA SUSANA FIELD LABORATORY, CANOGA PARK (ORDER NO. R4-2009-0058)

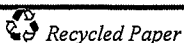
Dear Mr. Movassaghi:

Mary Ann Lutz, Chair of the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board), has asked me to respond on her behalf to your letter dated June 12, 2009. In that letter, you stated that you wish to correct the record regarding comments made by a representative of The Boeing Company (Boeing) at the May 8, 2009 Los Angeles Water Board public hearing. Although we acknowledge your response to Boeing's comments, you should know that the record for this matter was closed on May 8, 2009. On that date, the Los Angeles Water Board reached its final decision in this matter and will not consider any additional evidence at this time. Accordingly, we will not include your letter in the administrative record for this matter.

As you note, Los Angeles Water Board staff and Department of Toxics Substances Control (DTSC) staff have worked in close cooperation for many years to ensure that human health and the environment are protected both onsite and downstream of the site. This relationship has resulted in a number of interim removal actions onsite that have addressed historical exceedances of effluent limitations included in our National Pollutant Discharge Elimination System (NPDES) permits. The Fact Sheet considered by the Los Angeles Water Board on May 8, 2009 included several references to DTSC's involvement in site assessment and cleanup, including interim actions to address elevated soil concentrations of perchlorate and mercury that was contributing to exceedances of effluent limits in our NPDES permits. Thus, the Los Angeles Water Board was provided with information pertaining to DTSC's involvement at the site.

Further, regarding the substance of Boeing's comments about the Department of Toxic Substances Control (DTSC), there is no evidence that the Los Angeles Water Board accepted Boeing's statements as accurate. As is typical in most proceedings where one-sided comments are made concerning another person, without that person being present to defend themselves, the Los Angeles Water Board takes such one-sided comments with a grain of salt. Further, there is no evidence that, even if Boeing's comments about DTSC had been accepted as accurate, the

California Environmental Protection Agency



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

Mr. Maziar Movassaghi
Acting Director

- 2 -

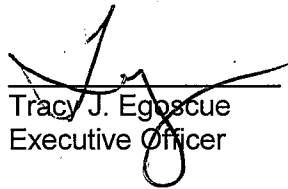
June 16, 2009

Los Angeles Water Board relied upon any of those comments in making its decision. Accordingly, there is no evidence that the information in your letter would have led to a different outcome.

Lastly, we would like to take this opportunity to thank you for your continued efforts to cleanup the site and for your commitment to work cooperatively with the Los Angeles Water Board. This cooperative relationship will enhance both agencies' ability to achieve the final goal of cleaning the site to Senate Bill 990 standards and subsequently having storm water runoff from the site that complies with the applicable water quality based effluent limitations. We look forward to working with you to reach this goal.

If you have any questions, please contact me at (213) 576-6605.

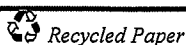
Sincerely,


Tracy J. Egoscue
Executive Officer

cc: Ms. Mary Ann Lutz, Chair
Ms. Madelyn Glickfeld, Vice Chair
Mr. Steve Blois
Ms. Francine Diamond
Ms. Maribel Marin
Ms. Maria Mehranian
Mr. Dick Richardson
Los Angeles Regional Water Quality
Control Board
320 W. Fourth Street, Suite 200
Los Angeles, California 90013

Ms. Mary Armstrong
Vice President of Environment,
Health and Safety
The Boeing Company
100 North Riverside
Chicago, Illinois 60606

California Environmental Protection Agency



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304-1148

Certified Mail

April 21, 2009

In reply refer to SHEA-108548



Mr. Norman Riley
Project Director
California Department of Toxic Substances Control
1001 "I" Street
P. O. Box 806
Sacramento, California 95812-0806

RE: Feasibility Study (FS) Work Plan
Santa Susana Field Laboratory, Ventura County, California

Dear Mr. Riley:

Pursuant to the draft schedule for corrective action developed in accordance with the August 2007 Consent Order for Corrective Action, Boeing is submitting the attached Feasibility Study Workplan, Santa Susana Field Laboratory, prepared by MWH and dated April 2009. This document is submitted on behalf of the Boeing Company, the Department of Energy, and the National Aeronautics and Space Administration. This document has been prepared to meet anticipated requirements as an FS Work Plan to comply with the anticipated 2009 Consent Order rather than as a Corrective Measures Study (CMS) Work Plan, as stipulated in the 2007 Consent Order for Corrective Action, Docket No. P3-08/003.

Please address any questions regarding this workplan to Mr. David Dassler at (661) 210-5673.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Thomas D. Gallacher
Name: Thomas D. Gallacher
Director, Santa Susana Field Laboratory
Title: Environment, Health and Safety
Date: April 20, 2009

DWD:bjc

cc: Distribution

Mr. N. Riley, DTSC (SHEA-108548)

April 21, 2009

Page 2

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Ms. L. Light, LA Public Library, Platt Branch	(1 hard copy)



**FEASIBILITY STUDY WORK PLAN
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA**

Prepared For:

THE BOEING COMPANY

The NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

and

THE UNITED STATES DEPARTMENT OF ENERGY

Prepared By:

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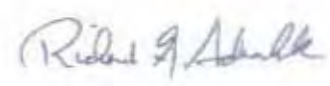
April 2009

**PROFESSIONAL CERTIFICATION
FEASIBILITY STUDY WORK PLAN
Santa Susana Field Laboratory
April 2009**

This work plan has been prepared by a team of qualified professionals under the supervision of the senior staff whose seal and/or signature appears below.




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**FEASIBILITY STUDY WORK PLAN
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA**

***APPENDIX B
SUMMARY OF SSFL INTERIM MEASURES***

Prepared For:

THE BOEING COMPANY

The NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

and

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LIST OF ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing material
B203	Building 2203
B359	Building 1359
BBC	Brandeis-Bardin Campus
Boeing	The Boeing Company
bgs	below ground surface
CAO	Cleanup and Abatement Order
cy	cubic yards
DTSC	Department of Toxic Substances Control
DOE	United States Department of Energy
ELV	Expendable Launch Vehicle
FS	feasibility study
FSDF	Former Sodium Disposal facility
H&A	Haley & Aldrich
HVIM	Happy Valley Interim Measures
HVN	Happy Valley North
HVS	Happy Valley South
ICF	ICK Kaiser
IM	interim measures
IT	IT Corporation
LLRW	low-level radioactive wastes
LOX	liquid oxygen
mg/kg	milligrams per kilogram
MWH	MWH, Inc.
µg/kg	micrograms per kilogram
NaK	sodium potassium
NASA	National Aeronautics and Space Administration
ng/kg	nanograms per kilogram
NPDES	National Pollutant Discharge Elimination System

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

NRC	United States Nuclear Regulatory Commission
Ogden	Ogden Environmental and Energy Services Company, Inc.
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Rockwell	Rockwell International
RWQCB	Regional Water Quality Control Board
SBA	soil borrow area
SSFL	Santa Susana Field Laboratory
SVOC	semi-volatile organic compound
TEQ	toxic equivalent
TPH	total petroleum hydrocarbons
UXB	UXB International, Inc.
UXO	unexploded ordnance
VOC	volatile organic compound
Zenco	Zenco Engineering

APPENDIX B

B.1.0 INTERIM MEASURE AND REMOVAL ACTION PROGRAMS

This appendix to the Feasibility Study (FS) Work Plan summarizes interim measures (IMs) for both the Surficial Media and Chatsworth Formation Operable Units that have been conducted at the Santa Susana Field Laboratory (SSFL). These IMs were overseen by the California Department of Toxic Substances Control (DTSC), the regulatory agency responsible for the Resource Conservation and Recovery Act (RCRA) Corrective Action Program at the SSFL. The IMs, summarized on Table B-1, have applicability to the FS as they can be used in the evaluation of the implementability, effectiveness and/or cost of the technology applied for the IM.

Interim measures for the Surficial Media Operable Unit (Surficial OU) have been conducted at five different locations across the SSFL. Descriptions of IMs conducted at each of the five locations are provided below and their locations are shown on Figure B-1.

B.2.0 FORMER SODIUM DISPOSAL FACILITY (FSDF) INTERIM MEASURES

The Former Sodium Disposal Facility (FSDF) RCRA Facility Investigation (RFI) Site is approximately 4.3 acres and is located in the western portion of Area IV at the SSFL. IM activities were conducted at the site from 1992 to 1993, and again from 2000 to 2001.

B.2.1 FSDF IM Program Area

The FSDF was used to clean metallic sodium and sodium/potassium mixtures (NaK) from equipment and for waste disposal. For purposes of characterization, the FSDF and its drainages were divided into the Lower Pond, Upper Pond, Western Area, and drainage channels A, B and C.

B.2.2 FSDF IM Program Scope and Objective

In 1992, the Regional Water Quality Control Board (RWQCB) and DTSC jointly approved the Lower Pond Closure Plan with modifications (RWQCB, 1992a). Soil excavation was initiated, and approximately 12,000 cubic yards (cy) were removed from the Lower Pond (ICF, 1997). The RWQCB notified Rockwell that all Board requirements had been met for the closure of the Lower Pond (RWQCB, 1992b). The first shipment of hazardous soil waste, which only included soils that did not originate in a radioactive materials management area, were disposed offsite at a Class I Landfill operated by Chemical Waste Management in Kettleman City (DOE, 2000). Soil that contained low-level radioactive wastes (LLRW), including mixed waste and soils classified as radioactive only, were disposed at the United States Nuclear Regulatory Commission (NRC) licensed LLRW disposal site operated by Envirocare in Olive, Utah (DOE, 2000). At that time, further action at the site was halted pending determination of cleanup goals and confirmation sample collection. Oversight of the continued cleanup activities was transferred to DTSC with implementation of the Closure Plan.

During this cleanup activity, contaminated pieces of zirconium metal (lathe turnings) were found in the Western Debris Area, along with remains of containers. The turnings, containers, and surrounding soil were also removed during the 1992 excavation (Rockwell, 1992a). A small amount of asbestos was reportedly removed from the excavation in 1993 (Rockwell, 1993).

In 1999, an IM Work Plan was prepared for the Upper Pond, the Western Area, and Channels A, B, and C. The work plan outlined the proposed excavation areas and provided detailed plans for excavation, backfilling, confirmation sampling, and monitoring. Cleanup goals for dioxins/furans and polychlorinated biphenyls (PCB) were developed based on a human health risk assessment using previous sampling data. The cleanup levels established were 600 micrograms per kilogram [$\mu\text{g}/\text{kg}$] for PCBs and 13.1 nanograms per kilogram [ng/kg] toxic equivalency quotient (TEQ) for dioxins using 1999 equivalency methods (IT, 1999). DTSC approved the FSDF IM Work Plan in December 1999 (DTSC, 1999).

The FSDF IM Work Plan removal action was implemented, and soil within the Upper and Lower Ponds and the upper portion of Channel B was excavated to bedrock. Based on additional sampling data evaluation, in addition to dioxins and PCBs, cleanup levels were established for mercury (0.3 milligrams per kilogram [mg/kg]) and perchlorate (any detection) (IT, 2002). Soils were also removed from the Western Area and the Southern Metal Anomaly Area. Drainage sediments and over-bank deposits were removed from Channels A, B, and C. Removed soils were disposed offsite at a Class I Landfill operated by Safety Kleen in Buttonwillow, California in 2001 (IT, 2002). The Upper and Lower Pond excavation and upper Channel B were backfilled to depths reaching approximately 13 feet below ground surface (bgs) with clean soil from the DTSC-approved Area IV Soil Borrow Area (SBA) (IT, 2002; DTSC, 2000). The backfill was compacted, and infiltration monitoring system installed, and the area re-vegetated. A total of 14,928 tons (approximately 12,000 cy) of soil, debris, bedrock, and construction materials were disposed of offsite during the 2000 FSDF IM.

B.2.3 FSDF IM Sampling Program Details

Almost 600 samples were collected and analyzed for chemical contaminants including: dioxins, metals, perchlorate, volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs) and total petroleum hydrocarbons (TPH). In addition, radiological surveys were conducted to measure radionuclides in soil and groundwater. Results of these analyses are presented in the Group 8 RFI Report (MWH, 2007b).

B.2.4 FSDF IM Program Results

A total of 24,000 cy of soil, debris, bedrock, and construction materials were removed and disposed of offsite during the two IMs. Groundwater and surface water monitoring are ongoing.

B.3.0 HAPPY VALLEY AND BUILDING 359 (B359) INTERIM MEASURES

Three adjacent RFI sites in Area I were the subject of related IM activities in the 1990s and 2000s: Building 1359 (B359), Happy Valley North (HVN) and Happy Valley South (HVS). Detailed information on these sites is presented in the IM Reports (Happy Valley

Interim Measures [HVIM] Excavation Reports [MWH, 2004 and 2005] and HVIM Final Report [MWH, 2007]) and summarized in the Group 1A RFI Report (MWH, 2009).

The first interim measure took place from January 1999 to January 2000. The purpose was to investigate for, excavate, and dispose of suspect unexploded ordnance (UXO) from the Happy Valley and B359 areas (UXB, 2002).

The second interim measure, known as the HVIM, was conducted from Fall 2003 to Fall 2006. The primary purpose of the HVIM was to reduce the release of perchlorate to surface water runoff at the three RFI sites. The HVN and B359 RFI Sites were used as staging areas for biotreatment of perchlorate-impacted soil excavated at the HVS RFI Site. The secondary purpose of this interim measure was to excavate metals-impacted soil at the three RFI sites and dispose of this soil offsite.

B.3.1 Happy Valley Area IM Program Area

Both IMs were conducted at all the three RFI sites: B359 (3.5 acres), HVN (1.3 acres) and HVS (12.7 acres). The B359 Area, the northernmost of the three sites, formerly contained approximately 10 buildings, all of which have been completely removed. The HVN RFI Site is approximately 1.3 acres encompassing the former Tunnel Facility and former Buildings 1315 and 1316. All structures at this site have been removed. The HVN RFI Site is separated from the HVS RFI Site by a ridge that forms a surface water divide. The HVS RFI Site is the southernmost of the three sites, and surface water from this site flows into the Happy Valley Drainage that extends approximately 3,000 feet from the operational area to the property boundary. Facility operations were conducted in the area near Building 1372 located north of the Happy Valley Drainage. The facility operational area formerly contained 25 small structures, typically solitary buildings, all of which have been removed.

B.3.2 Happy Valley Area IM Program Scope and Objective

In 1999, as part of the interim measure to remove suspect energetic and/or ordnance items, surficial soils were investigated at and near the B359, HVN and HVS RFI Sites (UXB, 2002). The scope of work for the 1999 IM included the following:

- Acquiring appropriate permits and authorizations for the proposed work;
- Surface UXO clearance;
- Debris removal and soil sifting;
- Geophysical survey;
- Anomaly investigation;
- Storage and disposal of suspect UXO; and
- Site restoration.

As a result of this IM, in 2003 The Boeing Company (Boeing) submitted a deed notification for portions of land at these three RFI sites that requires additional actions to be taken prior to excavating in this area, and would notify future landowners of this condition. A geophysical survey was performed to confirm that ordnance and suspect ordnance had been removed (UXB, 2002).

The objective of the 2003 HVIM was to control perchlorate releases to surface water at the three RFI sites. In summary, the scope of work for the excavation and restoration portion of the HVIM included the following:

- Acquiring appropriate permits and authorizations for the proposed work;
- Collecting and analyzing soil, bedrock, soil leachate, and surface water characterization and confirmation samples;
- Excavation of soil at the Happy Valley drainage, B359, and Building 1316 areas that contain metals at concentrations that exceed site screening levels for transportation offsite and disposal;
- Excavation of soil that contains perchlorate in the Happy Valley drainage area;
- Transportation of soil that contains perchlorate from the Happy Valley drainage area to the B359 area for *ex situ* biotreatment;
- Backfilling of excavations at the Happy Valley drainage area with clean backfill from a DTSC-approved onsite SBA;
- Restoring the vegetation within the backfilled Happy Valley Drainage excavation areas; and
- In situ biotreatment of soils that contain perchlorate at the B359 area, as well as two adjacent building footprints, the Building 1316 and 1376 areas.

The bulk of HVIM excavation activities were conducted between October 2003 and January 2004, and focused primarily on perchlorate removal actions within the Happy

Valley drainage area. Excavation was also conducted at five locations in the B359 and Building 1316 areas and two former building foundation areas within the Happy Valley drainage area to remove soils that contained metals at concentrations that exceeded site screening levels. HVIM biotreatment activities were initiated in October 2004, and continued through the 2005 and 2006 summer seasons.

B.3.3 Happy Valley Area IM Sampling Program Details

Several thousand samples were collected from soil, surface water, and groundwater as a part of the characterization for these IM activities. A majority of the samples were analyzed for perchlorate, but hundreds of samples were collected and analyzed for chemical contaminants including but not limited to: dioxins, metals, VOCs, SVOCs, and TPH. Results for these analyses are presented in the HVIM Excavation Reports (MWH, 2004 and 2005), the HVIM Final Report (MWH, 2007a), and the Group 1A RFI Report (MWH, 2009). During the biotreatment phase of the HVIM, hundreds of samples were collected and analyzed for perchlorate.

B.3.4 Happy Valley Area IM Program Results

During the 1999 IM, portions of all three RFI sites were surveyed for debris. In the operational area at the HVS RFI Site, surficial soils were excavated to about 1 foot deep, sifted to identify debris or suspect ordnance, and replaced. Additionally, approximately 1,800 cy of soil were removed during the 1999 IM, primarily from the upper Happy Valley Drainage south of Building 1372 (UXB 2002).

In 2003, approximately 1,170 cy of non-hazardous, metals-impacted soils were removed from the B359 and HVN RFI Sites and disposed of offsite in preparation for performing perchlorate biotreatment at the site (MWH, 2004). These soils were transported offsite to Chemical Waste Management, a Class I Landfill located in Kettleman City, California, following all applicable waste disposal regulations.

Biotreatment was initiated at the B359 and HVN RFI Sites in October 2004, including approximately 8,000 cy of *ex situ* soils from the HVS RFI Site, and approximately 9,100 cy of *in situ* soils. Biotreatment activities were concluded in August 2006, and the

biotreatment area was re-contoured to conform to the surrounding topography and reduce slopes to control erosion (MWH, 2007a). In February 2007, approximately 80 cy of soils were excavated at the B359 RFI Site to remove residual shallow soils that were not effectively treated, which were transported offsite to Chemical Waste Management (MWH, 2007a). DTSC recently provided comments regarding the HVIM activities, and conditionally approved completion of the HVIM (DTSC, 2008).

B.4.0 BUILDING 2203 (B203) INTERIM MEASURE

The B203 IM was located on an upland hill north of Building 2203 (B203) at the Expendable Launch Vehicle (ELV) RFI Site that slopes northwest toward an intermittent stream. This area receives surface water runoff from the western portion of the ELV RFI site. The B203 IM activities were conducted from July to October 2004.

B.4.1 B203 IM Program Area

The ELV RFI Site in Area II comprises approximately 1.6 acres and consists of Buildings 206, 202, 203, and the drainage north of B203. The B203 IM occurred in the drainage north of the B203 area; information for the entire ELV RFI Site is presented in the Draft Group 2 RFI Report (NASA, 2008). For the purposes of the Interim Measure, the area was divided into three parts: Areas A, B and C, corresponding to the mercury soil source area (Area A) and areas of decreasing soil mercury concentrations downslope from the source area (Areas B and C, respectively). An area lateral to the source area was also addressed (Area D).

B.4.2 B203 IM Program Scope and Objective

The objectives of the B203 IM were to remove mercury-impacted soils from an upland source area (Area A), and prevent the potential migration of mercury in soil to the downslope drainage prior to the 2004/2005 rainy season. The mercury target action level for B203 IM excavation activities was 0.09 mg/kg, based on the maximum concentration of mercury in the DTSC-approved SSFL soil background data set (Ogden 2000, MWH 2003, DTSC 2004).

The scope of work for the B203 IM included the following:

- Acquiring appropriate permits and authorizations for the proposed work;
- Collecting and analyzing soil and bedrock samples to delineate and confirm the excavation areas;
- Excavating soil and bedrock that contained mercury concentrations greater than 0.09 mg/kg in Areas A and D, including a small area of soil that contained elevated VOCs;
- Performing oak tree surveys and monitoring as required during field activities;
- Stockpiling excavated materials for subsequent offsite disposal according to applicable regulations;
- Backfilling IM excavation areas with clean soil from the SSFL onsite SBA and restoring the area to approximate pre-excavation contours;
- Reseeding to restore vegetation within the B203 IM area; and
- Implementing surface water and erosion control measures following completion of excavation activities.

The scope of the B203 IM field program included excavation of soil and bedrock containing mercury in Areas A and D, and subsequent restoration of these areas. Field activities for the B203 IM began with excavation of soil and bedrock on July 19, 2004, and were completed on October 1, 2004 following surface re-contouring, implementation of erosion control measures, and reseeded to restore vegetation.

B.4.3 B203 IM Sampling Program Details

Three-hundred thirty characterization samples were collected and analyzed for mercury. To evaluate the progress and completeness of the IM, characterization sampling continued during excavation activities in July and August 2004. Effectiveness of the B203 IM is being monitored by collection and analysis of surface water samples for mercury at the National Pollutant Discharge Elimination System (NPDES) sampling point at the downgradient excavation boundary. Monitoring began in October 2004 at the beginning of the 2004/2005 rainy season, and is ongoing.

B.4.4 B203 IM Program Results

Approximately 3,000 cy of soil and bedrock that contained mercury were removed and stockpiled; approximately 250 cy of this material also contained VOCs. In most areas, soil was excavated down to and including the upper weathered portion of bedrock using excavators, vacuum trucks, and hand shovels. Soil and bedrock characterized as non-hazardous waste were transported to Antelope Valley Class III landfill, located in Antelope Valley, California. Approximately 15 cy of soil, considered to be hazardous waste based on elevated mercury concentrations (up to 50 mg/kg total mercury), were segregated and transported to the Chemical Waste Management disposal facility, a Class I landfill located in Kettleman Hills, California.

B.5.0 NORTHERN DRAINAGE AND LOX REMOVAL PROGRAMS

The Northern Drainage program area includes the North Drainage, which extends east to west from the former Rocketdyne-Atomics International Rifle and Pistol Club, Inc. shooting range (former shooting range) located on Sage Ranch property, immediately north of SSFL, to the former Liquid Oxygen (LOX) Plant RFI Site, past the Area II Landfill, and finally turns north onto Jewish American University, Brandeis-Bardin Campus (BBC) property. Two interim removal actions have been performed to date. The LOX removal program was implemented in Fall 2007, and was conducted to remove debris and soil containing antimony and asbestos-containing material (ACM). Approximately 2,500 cy of debris and soil were excavated and transported offsite for disposal. The Northern Drainage clay target debris removal associated with the former shooting range was initiated in August 2007 and continued through December 2008, with approximately 9,400 cy of soil and debris removed. Completion of the clay pigeon target debris removal will continue into 2009. Removal of residual lead shot associated with the former shooting range is also in progress. For the purpose of this FS Work Plan summary, samples collected prior to November 2008 are described and presented.

B.5.1 Northern Drainage Removal Action Program Area

The Northern Drainage removal action program area includes the former shooting range located on the Sage Ranch, immediately north of SSFL, the offsite portion of the Northern Drainage between the former shooting range to the former LOX Plant, and the portion of the Northern Drainage west of the former LOX plant that extends north onto the BBC.

The Northern Drainage roughly bisects the former shooting range area, extending east to west and extends approximately 8,000 linear feet (1.5 miles) from the east end of the former shooting range to Outfall No. 009, leaving SSFL property and entering Brandeis-Bardin approximately 500 feet north of Outfall 009.

B.5.2 Northern Drainage Removal Action Program Scope and Objective

RFI soil and debris samples collected between June and September 2007 indicated asbestos and antimony were present in the LOX debris area. On November 1, 2007, the DTSC issued to Boeing and the National Aeronautics and Space Administration (NASA) an Imminent and Substantial Endangerment Determination and Order and Removal Action Order requiring the cleanup of the Northern Drainage area of the SSFL (DTSC, 2007a). Additionally, on November 6, 2007, the RWQCB issued Boeing a Cleanup and Abatement Order requiring Boeing to clean up the Northern Drainage area (RWQCB, 2007). The objective of the LOX Debris Removal Action was to remove this debris and soil containing asbestos and antimony from the debris area in the Northern Drainage. Both orders applied to property encompassed within the “Northern Drainage,” including the former LOX Plant debris area, and the former shooting range. The former LOX Plant debris area represents the first phase of the removal action that was implemented in the Fall 2007, while the remainder of the Northern Drainage, including the former shooting range, was to begin in the Summer 2008.

LOX Debris Area

The scope of work for the LOX Debris Removal Action included the collection and analysis of soil characterization samples, removal and offsite disposal of soil that

contained ACM and/or antimony in the LOX debris area, the collection and analysis of soil confirmation samples, and the implementation of post soil removal surface water and erosion control measures.

The Northern Drainage Debris/Asbestos Work Plan (Zenco, 2007) was approved by the DTSC on November 13, 2007 (DTSC, 2007b) and fieldwork was performed from November 13, 2007 through December 21, 2007. As reported in the LOX debris removal report, approximately 2,500 cy of soil with elevated antimony and ACM was removed from the LOX debris area (MWH, 2008). Soil and ACM were contained in roll off bins and transported offsite for disposal to Chemical Waste Management, Inc., a Class I Landfill located in Kettleman City, California.

Former Shooting Range Area

The objective of the clay target removal action was to remove remnants of clay targets used in skeet and trap shooting from the former shooting range area and from the Northern Drainage banks and streambed deposits. Clay target debris are the suspected source of polyaromatic hydrocarbon (PAH) contamination found in the Northern Drainage from previous sampling events.

The proposed scope of work for the Clay Target Debris Removal Work Plan (H&A, 2008) was based on a meeting with the DTSC on June 22, 2007, a subsequent letter to the DTSC on July 6, 2007, and discussions with the DTSC staff on August 7, 2007. Activities from the Clay Target Debris Removal Work Plan scope of work completed in 2008 include a visual survey for clay target debris along approximately 8,000 linear feet of drainage from the former shooting range to NPDES Outfall 009, biological and cultural surveys for sensitive and/or endangered species and historical cultural artifacts, removal of clay target debris in the former shooting range area using a backhoe or other heavy equipment, removal of surficial deposits of clay target debris with a vacuum truck or manual means as necessary, and soil confirmation sampling to determine if additional soil removal is necessary.

During field implementation of shooting range source area removal activities, an area of buried trash and debris north of the former shooting range area was encountered. This debris and surrounding impacted soil was removed under DTSC oversight.

The Northern Drainage clay target debris removal action has been on hold since December 2008 and will resume after the end of the 2008/2009 rainy season. Soil and debris removal are scheduled to continue between NPDES Outfall 009 and the BBC after April 2009. Approximately 9,400 cy of impacted soil and anthropogenic debris has been removed and transported offsite for disposal from the former shooting range area and the Northern Drainage bank and streambed deposits.

B.5.3 Northern Drainage Removal Action Sampling Program Details

Approximately 400 samples were collected and analyzed for chemical constituents including: VOCs, SVOCs, dioxins, perchlorate, pesticides, herbicides, metals, TPH, and asbestos. The results from the LOX Debris Area Removal Action are presented in the Former LOX Plant Debris/Asbestos Removal Action Report (MWH, 2008). The results from the ongoing Northern Drainage Clay Target Debris Removal Action will be report in an upcoming report. Approximately 2,500 cy of soil and debris were removed during the LOX Debris area removal action completed in December 2007. The results from the ongoing Northern Drainage Clay Target Debris Removal Action will be report in an upcoming report. To date, approximately 6,500 cy of soil and debris were removed the Former Shooting Range Area, and 2,900 cy of soil and clay target debris were removed from the Northern Drainage between the Former Shooting Range and Outfall 009. The soil removal action in the Northern Drainage is scheduled to continue beyond Outfall 009 in the Spring of 2009 after the end of the 2008/2009 rainy season.

B.5.4 Northern Drainage Removal Action Program Results

As of December 2008, approximately 11,900 cy of soil and debris have been removed during two removal actions from the LOX and Northern Drainage debris areas. The additional volume of soil and debris to be removed after the removal action continues in Spring 2009 is unknown. Additional soil confirmation sampling will be conducted

following soil/sediment removal in the Northern Drainage between the former LOX plant and the BBC.

Surface water sampling results collected in response to a Cleanup and Abatement Order (CAO) issued by the RWQCB are included in monthly monitoring reports. Surface water sampling results collected as required by the RWQCB for this removal action are described in reports submitted to the RWQCB quarterly.

B.6.0 GROUNDWATER INTERIM MEASURES

The groundwater interim measure summary that was prepared by Haley & Aldrich (H&A) is provided in Attachment B-1. In summary, over 1.7 billion gallons of groundwater from both the surficial media and Chatsworth formation operable units have been extracted and treated, resulting in the removal of about 2,700 pounds of volatile organic compounds.

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TABLES

Table B-1
Summary of SSFL Interim Measures for Surficial Media and Chatsworth Formation Operable Units
(Page 1 of 2)

OU/ Media	Location	Timeframe	Technology	Process Option	Contaminants	Clean-up levels	Volume	Units	Disposal Location
Surficial OU: Soil / Sediment / Bedrock	FSDF	1992 - 1993	Excavation	Offsite disposal	Mercury	Not specified ⁽¹⁾	11,200	cy	Chem Waste, Kettleman City, CA
					PCBs	Not specified ⁽¹⁾			
					Dioxins/Furans	Not specified ⁽¹⁾			
					LLRW	6 mCi Cs-137	300	cy	Envirocare, Olive, UT
	FSDF	2000	Excavation	Offsite disposal	1 mCi Sr-90	6 mCi Cs-137	420	cy	Envirocare, Olive, UT
					Mixed Waste	1 mCi Sr-90	245	cy	Chiquita Canyon, Valencia, CA
					Debris and Scrap	Detection			
	Happy Valley	1999 - 2000	Excavation	Offsite disposal	PCBs	600 ug/kg	12,000	cy	Safety-Kleen, Buttonwillow, CA
					TCDD TEQ	13.1 ng/kg			
					Mercury	0.3 mg/kg			
					Perchlorate	Detection			
	Happy Valley	2003	Excavation	Aboveground biological reduction	Unexploded Ordnance	Detection	1,800	cy	Chem Waste, Kettleman City, CA
	Happy Valley	2007	Excavation	In situ Biological reduction	Perchlorate	6 ug/L ⁽²⁾	8,000	cy	Remain
							9,100	cy	Remain in situ
							80	cy	Chem Waste, Kettleman City, CA
	Building 2203	2004	Excavation	Offsite disposal	Mercury	0.09 mg/kg ⁽³⁾	15	cy	Chem Waste, Kettleman City, CA
							3,000	cy	Antelope Valley Landfill, Antelope Valley, CA
	LOX	2007	Excavation	Offsite disposal	Antimony ACM	30 mg/kg ⁽⁴⁾ Detection	2,500	cy	Chem Waste, Kettleman City, CA
	Northern Drainage	2007 - 2008	Excavation	Offsite disposal	Antimony ACM	30 mg/kg ⁽⁵⁾ Detection ⁽⁵⁾	9,400	cy	Chem Waste, Kettleman City, CA
					Lead (as lead shot)	Visual ⁽⁶⁾			
	Northern Drainage	2007 - 2008	Excavation	Offsite disposal	Total PAHs	1 mg/kg ⁽⁵⁾	9,400	cy	Chem Waste, Kettleman City, CA
					BaPEQ	0.723 mg/kg ⁽⁵⁾			

Table B-1
Summary of SSFL Interim Measures for Surficial Media and Chatsworth Formation Operable Units
(Page 2 of 2)

OU/ Media	Location	Timeframe	Technology	Process Option	Contaminants	Clean-up levels	Volume	Units	Disposal Location
Surficial OU; CFOU; Groundwater	Sitewide	1984 - 2005	Extraction	Trench Wells	Not applicable	Not applicable	> 10 ⁹	gallons	Discharged to surface water onsite in compliance with NPDES permit
			Aboveground Treatment	Ultra-violet light/ peroxide	NDMA	NPDES Permit Limit			
				Air-stripping Activated carbon Anion exchange	VOCs Perchlorate	NPDES Permit Limit NPDES Permit Limit			

Notes

- (1) Cleanup levels during the 1992 - 1993 FSDF IM were not specified in referenced documents, but were reportedly in compliance with RCRA Hazardous Waste classifications pending development of specific action limits (DOE, 2000).
- (2) Cleanup level represents target value to control perchlorate releases to surface water.
- (3) The IM action level for mercury was conservatively set at 0.09 milligrams per kilogram (mg/kg), equivalent to the DTSC-approved maximum soil background level (MWH, 2003).
- (4) Cleanup goal based on the California Human Health Screening Level.
- (5) Cleanup levels for Northern Drainage cleanup actions specified in DTSC ISE Order (DTSC, 2007).
- (6) Cleanup level for lead not specified for Northern Drainage cleanup actions.

Abbreviations

ACM - Asbestos-containing material	LOX - Liquid Oxygen Plant
BaPEQ - Benzo(a)pyrene equivalent	FSDF - Former Sodium Disposal Facility Building 4886
LLRW - Low-level radioactive waste	mCi - millicurie
TCDD TEQ - 2,3,7,8-Tetrachlorodibenzodioxin toxic equivalent	ug/L - micrograms per liter
PCB - polychlorinated biphenyl	mg/kg - milligrams per kilogram
cy - cubic yard	ng/kg - nanograms per kilogram
NDMA - n-Nitrosodimethylamine	Cs-137 - cesium-137
VOCs - volatile organic compounds	Sr-90 - strontium-90
PAH - polynuclear aromatic hydrocarbon	NPDES - National Pollution Discharge Elimination System

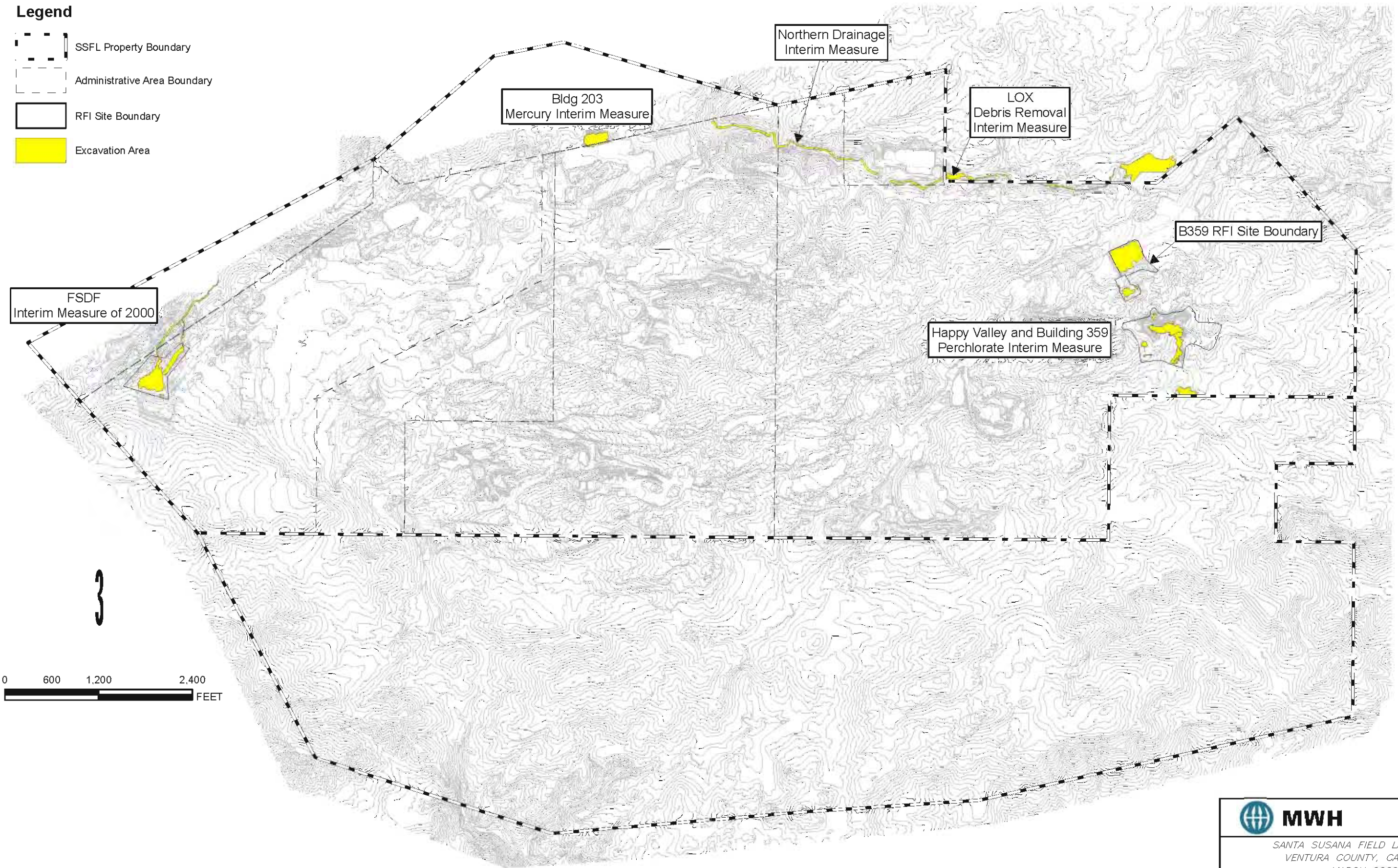
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FIGURES

Legend

- SSFL Property Boundary
- Administrative Area Boundary
- RFI Site Boundary
- Excavation Area



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MARCH 2009

LOCATIONS OF SURFICIAL MEDIA
INTERIM MEASURES

FIGURE B-1

ATTACHMENT B-1
SUMMARY OF GROUNDWATER RECLAMATION SYSTEM OPERATION
PREPARED BY HALEY & ALDRICH
MARCH 23, 2009

SYSTEM CONCEPT AND DESIGN

Conceptual design of the GRS was developed in 1987. The design of the GRS was based on the primary goals of preventing degraded groundwater from migrating beyond the Facility boundaries and extracting and treating degraded water present beneath the Facility. The conceptual design of the GRS included extraction from both the Near Surface Groundwater (NSGW) and the Chatsworth Formation groundwater systems. Satisfying the objectives of the GRS required developing and maintaining groundwater level depressions at the Facility to control groundwater flow and to extract degraded groundwater from "target areas". Target areas were identified as those portions of the Facility where concentrations of VOCs exceed 100 micrograms per liter (ug/L) in groundwater.

Groundwater gradient control was the mechanism by which the objective of preventing off-site migration of degraded groundwater was implemented. Because of the ephemeral and discontinuous nature of the NSGW, off-site migration of degraded groundwater in the NSGW was believed to present little risk. Therefore, the focus of groundwater gradient control was groundwater pumping from wells completed in the Chatsworth Formation.

The second goal of the groundwater remediation program was to pump and treat degraded groundwater at the Facility. This included treatment of both groundwater extraction for gradient control and groundwater extraction for removal of contaminant mass at target areas. Target area extraction was generally lower volume pumpage of groundwater containing higher concentrations of VOCs. The extraction of degraded groundwater from target areas was implemented to prevent contaminant mass from migrating and impacting deeper groundwater.

The locations of the some former RCRA impoundments were included within the target areas. In most cases, the groundwater contamination at these target areas occurred up-gradient of the former RCRA impoundments and likely resulted from releases from other source areas including engine test stands.

GROUNDWATER RECLAMATION SYSTEM COMPONENTS

Groundwater extraction/treatment was conducted at the Facility using a system of permanently constructed and permitted treatment units and associated extraction wells which were operated continuously from 1987 until late 2000 when a phased shutdown of the systems was initiated. Collectively, these site-wide systems were referred to as the Groundwater Reclamation System (GRS).

The GRS was designed to remove VOCs from groundwater to concentrations below the applicable California Department of Health Services standards (DOHS, 1994). The total treatment capacity of the systems was approximately 1,100 gpm. The GRS consisted of 30 extraction wells, one French-drain, one sump and eight treatment systems (Figure 1). Twelve of the extraction wells pumped degraded groundwater from the Chatsworth Formation and eighteen extracted degraded groundwater from the NSGW. Six of the treatment systems are dual packed tower aeration units with vapor phase carbon treatment (air stripping towers). The remaining two systems are ultraviolet light/hydrogen peroxide (UV/H₂O₂) units. Three of the treatment systems, the Canyon air stripping treatment system, the Air I Road air stripping treatment system and the RD-9 UV/H₂O₂ were taken out of operation near the end of 1998, and extraction wells associated with the de-activated systems were re-directed to other nearby treatment systems.

OPERATIONS OF THE GROUNDWATER RECLAMATION SYSTEM

The GRS became operational in 1986 with the construction and operation of the Bravo, Canyon, Delta air stripping units and WS-05 UV/H₂O₂ treatment system, which extracted groundwater from Chatsworth Formation wells to effect gradient control. The system was expanded in 1988 to include construction and operation of the Alfa air stripping tower and batch treatment of groundwater extracted from well RD-9 at the RD-9 UV/H₂O₂ treatment system. The system was expanded in 1990 to include extraction and treatment of groundwater pumped from 18 NSGW wells and 4 additional Chatsworth Formation wells (HAR-7, HAR-16, HAR-17 and HAR-18). Operation of the GRS was formally permitted with the issuance of the Facility Post Closure Permits in May 1995.

All systems operated regularly through October 1998, when the RD-9 UV/H₂O₂ treatment system and the Canyon air stripping towers were taken out of service. Wells which previously pumped to the RD-9 UV/H₂O₂ treatment system were re-routed to the Bravo treatment system, and well RD-1, which was routed to the Canyon system was re-routed to the Area I Road Treatment system. In September 2000, systems were further consolidated with the de-commissioning of the Area I Road treatment system. Wells which reported to the Area I Road Treatment system were re-routed to the WS-05 UV/H₂O₂ treatment system.

Beginning in late 2000, the GRS units were taken out of operation as part of the implementation of Chatsworth Formation Operable Unit (CFOU) investigation (MWH, 2000). Extraction of NSGW from target areas ceased between June 2000 and December 2000 (Table 1). Extraction of Chatsworth Formation groundwater from wells RD-1, RD-2, RD-4, RD-9 and WS-5 was discontinued in between August 2000 and December 2000, and operation of extraction well WS-6 ceased in March 2001. Wells WS-09 and HAR-07 continued operation through July 2002 and November 2002, respectively. Operation of wells HAR-18 and HAR-17 were discontinued in November 2002 and February 2003, respectively. By the end of the first quarter of 2003, only well WS-9A was operational. Well WS-9A was operational through August 2007, though pumping was interrupted from September 2005 until December 2006 as a result of damage from the Topanga fire to the pipeline connecting well WS-9A to the Delta treatment system. All extraction well operations ceased in August 2007.

Volumes of groundwater extracted from both groundwater zones and treated by the GRS ranged from a high of just over 159 million gallons in 1990 to just over 500,000 gallons in 2006 (Table 2). Annualized extraction rates ranged from a low of approximately 1 gallon per minute (gpm) in 2006 to approximately 303 gpm in 1990. Prior to the implementation of the CFOU work plan (1987-2000) which phased down the operation of the extraction wells, the annualized extraction rate ranged from a low of approximately 96 gpm to 303 gpm. With implementation of the CFOU work plan, annualized extraction rates ranged from 1 to 120 gpm. Over the twenty year operational life of the GRS greater than 1.7 billion gallons of impacted water were treated.

Estimates of the mass of VOCs removed by the GRS system were developed using monthly pumpage volumes and the total VOC concentrations as measure in monthly water samples collected from the influent stream at each treatment system. The measured concentrations of VOCs reported in the monthly groundwater samples were assumed to represent an average monthly concentration of VOCs for the purpose of calculating these estimates. Over the twenty year period 1987-2007 during which the GRS was operational it is estimated that approximately 2700 pounds of VOCs were removed.

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TABLES

DRAFT
ATTACHMENT B-1

TABLE I
SSFL EXTRACTION WELL SHUTDOWN
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Treatment System	Extraction Well	Month and Year of Shutdown	Shut Down Schedule
Alfa	WS-06	March 2001	CFOU Work Plan
Bravo	RD-04	December 2000	CFOU Work Plan
	WS-09	July 2002	Borehole Instability
	ES-21	October 2000	CFOU Work Plan
	ES-22	June 2000	CFOU Work Plan
	RD-09	December 2000	CFOU Work Plan
Delta	HAR-07	November 2002	Design Drawdown Not Met (low-level NDMA detects)
	WS-09A	September 2005	Topanga Wildfire
STL-IV	ES-14	July 2000	CFOU Work Plan
	ES-17	September 2000	CFOU Work Plan
	ES-23	December 2000	CFOU Work Plan
	ES-24	December 2000	CFOU Work Plan
	ES-26	December 2000	CFOU Work Plan
	ES-27	December 2000	CFOU Work Plan
	ES-30	November 2000	CFOU Work Plan
	ES-32	July 2000	CFOU Work Plan
	HAR-17	February 2003	Design Drawdown Not Met (low-level NDMA detects)
	HAR-18	November 2002	Design Drawdown Not Met (low-level NDMA detects)
	ECL Sump	August 2000	CFOU Work Plan
	ECL Fr Drn	June 2000	CFOU Work Plan
WS-05	ES-01	October 2000	CFOU Work Plan
	ES-03	October 2000	CFOU Work Plan
	ES-04	June 2000	CFOU Work Plan
	ES-05	June 2000	CFOU Work Plan
	ES-06	October 2000	CFOU Work Plan
	ES-07	April 2000	CFOU Work Plan
	ES-11	June 2000	CFOU Work Plan
	HAR-04	June 2000	CFOU Work Plan
	HAR-16	April 1997	Treatment Technology (high TCE concentrations)
	RD-01	August 2000	CFOU Work Plan
	RD-02	September 2000	CFOU Work Plan
	WS-05	October 2000	CFOU Work Plan

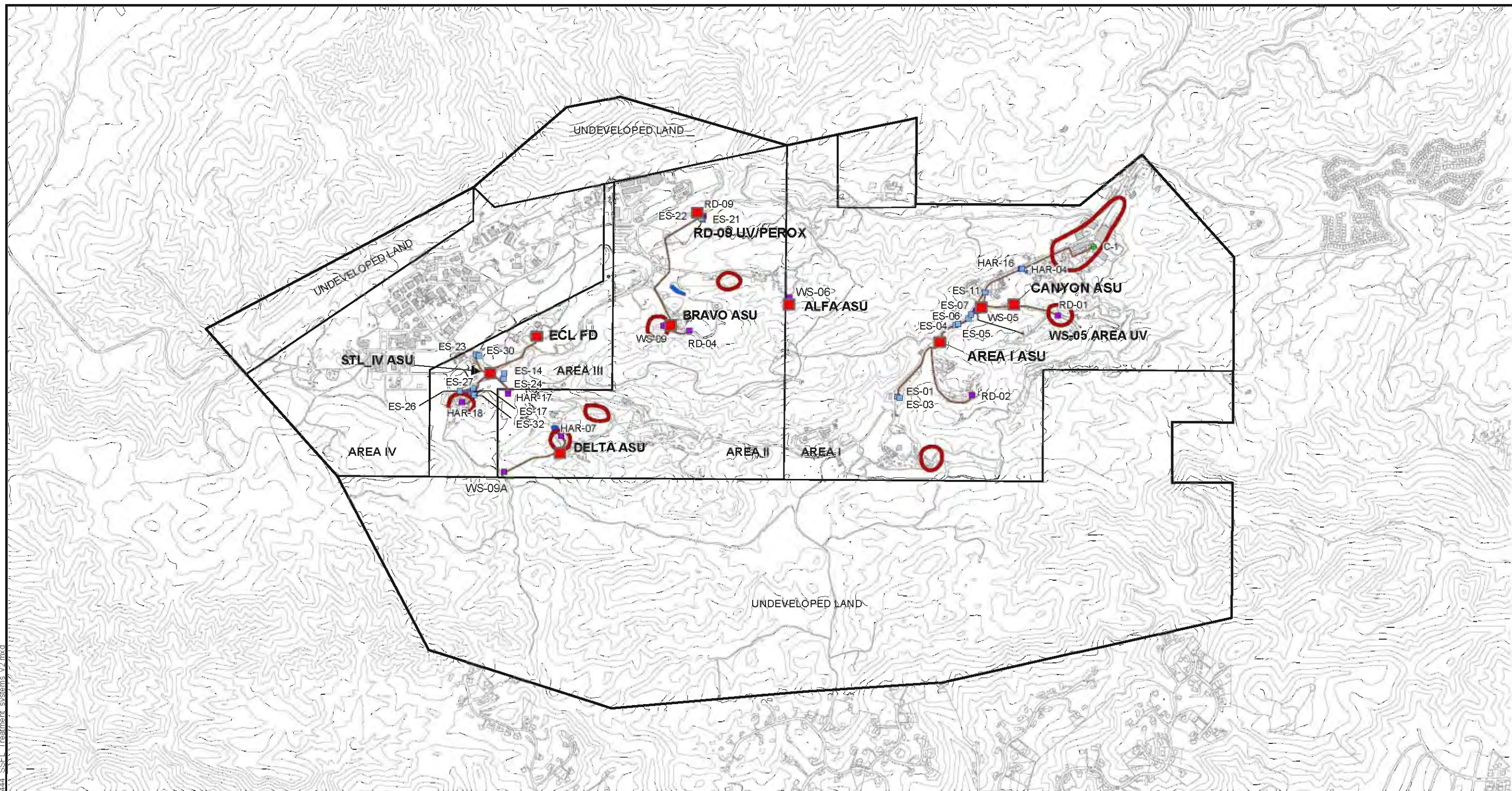
ATTACHMENT B-1
TABLE 2

SUMMARY OF 2000 GROUNDWATER EXTRACTIONS, PERMITTED REMEDIATION FACILITIES

Remediation System Extraction Well(s)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total Pumpage
Shallow Zone GRS (gallons)																							
ES-1 Area I Rd	---	---	---	0	0	50	220	10	60	210	10,400	32,000	10,200	7,300	0	0	0	0	0	0	0	0	0
ES-3 Area I Rd	---	---	---	0	12,296	130	260	30	50,048	4,937	363,600	53,000	269,200	234,100	0	0	0	0	0	0	0	0	0
ES-4 Area I Rd	---	---	---	0	0	326	650	30	112,880	0	44,800	260,700	0	6,200	0	0	0	0	0	0	0	0	0
ES-5 Area I Rd	---	---	---	0	0	300	310	50	81,070	7,990	53,300	149,100	900	15,500	0	0	0	0	0	0	0	0	0
ES-6 Area I Rd	---	---	---	33	481	9,470	500	260	3,990	54,900	202,900	442,800	78,400	88,800	0	0	0	0	0	0	0	0	0
ES-7 Area I Rd	---	---	---	0	2,028	580	10	50	1,475	0	6,200	35,700	2,200	100	0	0	0	0	0	0	0	0	0
ES-11 WS-5	---	---	---	0	47	40	0	70	1,790	3,450	0	26,500	11,600	8,600	0	0	0	0	0	0	0	0	0
ES-14 STL-IV	---	---	---	10	106	21,970	1,630	20	4,280	2,200	11,000	17,500	10,400	4,200	0	0	0	0	0	0	0	0	0
ES-17 STL-IV	---	---	---	21,621	141	9,725	1,650	38,950	72,500	37,910	41,700	25,000	16,200	11,700	0	0	0	0	0	0	0	0	0
ES-21 RD-9	---	---	---	0	0	160	0	36,100	28,700	65,200	111,300	83,200	89,800	47,500	0	0	0	0	0	0	0	0	0
ES-22 RD-9	---	---	---	0	0	0	0	62,010	187,660	40,070	45,300	80,400	220,500	46,800	0	0	0	0	0	0	0	0	0
ES-23 STL-IV	---	---	---	677	62	21,190	0	10,930	23,400	13,650	13,400	17,800	13,500	13,100	0	0	0	0	0	0	0	0	0
ES-24 STL-IV	---	---	---	0	0	6,991	1,150	7,510	100	9,248	23,100	17,800	17,300	14,600	0	0	0	0	0	0	0	0	0
ES-26 STL-IV	---	---	---	118,051	304	269,090	10,620	301,760	462,800	387,950	271,700	168,400	285,900	153,800	0	0	0	0	0	0	0	0	0
ES-27 STL-IV	---	---	---	1,550	202	57,460	1,930	46,460	50,600	56,030	54,900	28,200	44,700	26,000	0	0	0	0	0	0	0	0	0
ES-30 STL-IV	---	---	---	16,158	532	212,030	3,230	268,770	267,850	210,740	130,200	12,400	385,700	317,800	0	0	0	0	0	0	0	0	0
ES-32 STL-IV	---	---	---	433	112	359	290	1,070	2,858	4,852	1,600	500	8,300	1,300	0	0	0	0	0	0	0	0	0
HAR-4 WS-5	---	---	---	0	9,862	504,000	73,000	10,868	40,115	19,500	10,800	1,500	41,600	54,300	0	0	0	0	0	0	0	0	0
ECL Sump	---	---	---	6,331	13,589	45,100	27,760	33,010	221,165	84,755	142,000	240,500	195,900	51,500	0	0	0	0	0	0	0	0	0
ECL French-drain	---	---	---	6,771	20,029	46,450	24,850	107,360	459,420	708,570	442,000	577,200	67,000	33,000	0	0	0	0	0	0	0	0	0
Total Shallow Zone Extraction	0	0	0	171,635	59,791	1,205,421	148,060	925,318	2,072,761	1,712,162	1,980,200	2,270,200	1,769,300	1,136,200	0	0	0	0	0	0	0	0	13,451,048
Chatsworth Formation GRS (x 1,000 gallons)																							
RD-1 Canyon	2,706	5,203	10,386	10,224	4,697	5,932	5,540	7,837	3,642	6,465	6,751	5,139	4,583	1,017	0	0	0	0	0	0	0	0	0
RD-2 Air I Rd	0	0	1,068	8,252	8,179	8,687	5,542	4,537	6,665	4,203	6,979	4,848	8,448	4,294	0	0	0	0	0	0	1,386	0	0
RD-4 Bravo	37	0	1,701	16,424	3,264	611	17	606	31	906	4,691	5,847	2,408	3,820	0	0	0	0	0	0	0	0	0
RD-9 Bravo	0	622	0	0	36	83	666	987	835	953	517	115	627	665	0	0	0	0	0	0	0	0	0
WS-5 WS-5	38,105	39,135	21,864	34,733	48,852	57,943	54,447	70,047	50,266	27,567	21,333	26,029	32,889	17,185	0	0	0	0	0	0	0	0	0
WS-6 Alfa	0	12,509	55,877	60,761	62,266	55,687	44,322	38,529	49,653	19,029	33,661	27,740	22,541	23,613	4,684	0	0	0	0	0	0	0	0
WS-9 Bravo	1,318	0	4,310	6,641	6,891	4,742	4,450	5,483	4,825	4,240	3,931	3,845	4,039	2,823	3,697	1,458	0	0	0	0	0	0	0
WS-9A Delta	8,466	9,362	26,574	21,847	13,751	7,846	21,851	10,199	11,046	12,529	25,153	58,356	55,386	42,045	54,616	28,111	4,633	8,177	1,993	525	4,215	0	0
HAR-7 Delta	0	0	0	2	185	117	451	272	638	243	384	140	108	122	108	20	0	0	0	0	0	0	0
HAR-16 WS-5	0	0	0	1	19	282	187	49	367	110	13	0	0	0	0	0	0	0	0	0	0	0	0
HAR-17 STL IV	0	0	0	95	5	257	16	277	237	180	363	633	436	301	198	93	7	0	0	0	0	0	0
HAR-18 STL-IV	0	0	0	0	5	40	0	67	95	60	81	41	100	72	70	48	0	0	0	0	0	0	0
Total Chatsworth From Extraction	50,632,000	66,831,000	121,780,000	158,980,000	148,150,000	142,227,000	137,489,000	138,890,000	128,300,000	76,485,000	103,857,000	132,733,000	131,565,000	95,956,700	63,373,700	29,729,600	4,639,400	8,177,500	1,993,300	524,800	5,601,100	0	1,747,915,100
Total System	50,632,000	66,831,000	121,780,000	159,151,635	148,209,791	143,432,421	137,637,060	139,815,318	130,372,761	78,197,162	105,837,200	135,003,200	133,334,300	97,092,900	63,373,700	29,729,600	4,639,400	8,177,500	1,993,300	524,800	5,601,100	0	1,761,366,148

FIGURES

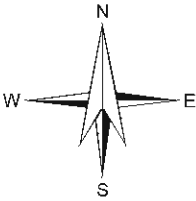
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LEGEND

— TCE GREATER THAN 1000 UG/L

- TREATMENT SYSTEM
- SHALLOW EXTRACTION WELL
- CHATSWORTH EXTRACTION WELL
- C-1 BOREHOLE
- TRANSMISSION PIPELINE



HALEY & ALDRICH THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

**EXTRACTION WELLS AND
TREATMENT SYSTEM COMPONENTS**

SCALE AS SHOWN
MARCH 2009