

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

Certified Mail

October 14, 2009
In reply refer to SHEA-109207



Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention: Tracy Egoscue

Subject: Response to Comments regarding Email Requesting Approval of Additional Work in the Outfall 009 Watershed, Email Amendment to the Final Interim Source Removal Action (ISRA) Work Plan California Water Code Section 13304 Order (NPDES NO. CA0001309, CI NO. 6027, SCP NO. 1111, SITE ID NO. 2040109)

Dear Ms. Egoscue:

On behalf of the National Aeronautics and Space Administration (NASA), The Boeing Company (Boeing) hereby provides the following in response to Regional Water Quality Control Board (RWQCB) comments regarding the above-referenced email Amendment to the Final Interim Source Removal Action (ISRA) Work Plan. The amendment was provided to the RWQCB by NASA via email on September 18, 2009 and describes the inclusion of two additional ISRA Areas within the Outfall 009 watershed located on NASA property, A2LF-1 and A2LF-3. RWQCB comments were received in a letter dated September 30, 2009, and are reproduced in their entirety in the attached response prepared by NASA.

We understand the RWQCB concur that the inclusion of the two additional areas is appropriate, and believe that the attached information will meet the RWQCB staff's request for additional information. If you have any questions or require anything further, please contact me at 818-466-8795. Boeing and NASA will not proceed

Ms. T. Egoscue, RWQCB (SHEA-109207)

October 14, 2009

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with work at these two areas until approval is received by the RWQCB staff. Thank you for your attention to this information.

Very truly yours,



Art Lenox
Environmental Remediation



AJL:bjc

Attachments:

1. Response to RWQCB Comments (September 30, 2009) on Amendment Request (September 18, 2009) to the Approved May 2009 Final Interim Source Removal (ISRA) Work Plan
2. Figures:
 - Interim Source Removal Actions, Outfall 009 Drainage Areas, Excavation Plan: A2LF-1
 - Interim Source Removal Actions, Outfall 009 Drainage Areas, Excavation Plan: A2LF-3
 - ISRA Excavation Area, Outfall 009, A2LF-1 (showing waste characterization sampling locations)
 - ISRA Excavation Area, Outfall 009, A2LF-3 (showing waste characterization sampling locations)
3. Waste Characterization Reports

cc: Ms. Cassandra Owens, RWQCB (with attachments)
Mr. Peter Raftery, RWQCB (with attachments)
Mr. Buck King, DTSC (with attachments)
Mr. Steve Slaten, NASA (with attachments)
Mr. Allen Elliott, NASA (without attachments)
Ms. Dixie Hambrick, MWH (without attachments)

**Response to RWQCB Comments (September 30, 2009) on
Amendment Request (September 18, 2009) to the Approved May 2009
Final Interim Source Removal Action (ISRA) Work Plan**

1. The organization of the submittal appears to be incomplete and missing some components that would be expected for a plan of this type.

Response: Comment acknowledged. NASA believes that the approved work plan provides the relevant background and details corresponding to the addendum request. If there are particular items that the RWQCB would like to see, please let NASA know.

2. Include a description of the background, a description of the samples collected and the associated results.

Response: NASA believes that the approved work plan provides the relevant background surrounding the ISRA-related work at SSFL, and that the original email addendum request states why these 2 additional areas (A2LF-1 and A2LF-3) were requested for inclusion as part of the on-going ISRA implementation.

The request also: a) stated that surface soil samples were collected to identify the ISRA boundaries for these 2 areas; b) included figures (identified in the request as Figures 1 and 2, respectively) showing the soil sampling locations; c) stated the main ISRA constituents (dioxins at A2LF-1 and lead at A2LF-3) driving the contaminant delineations; and d) included the tabulated laboratory analytical results for the samples. These figures portray the laboratory analytical results, in a manner consistent with other areas included in the approved work plan, and show the proposed excavation limits for inclusion as part of the current implementation phase.

The proposed A2LF-3 excavation area is limited to a segment of the drainage way that lies south of the service road. As shown in the tabulated laboratory analytical results that were included, samples in the drainage way indicated lead exceedances.

The results also showed lead exceedances for the 5-foot depth interval at sampling station A2BS1091 located immediately adjacent to the road, and in the upper 3 inches of surface soil at sampling station A2BS1090 located north of the road (see Figure 2 for locations). NASA decided to address ISRA actions related to these A2LF-3 areas at a future date, as the extent of contamination (both laterally and vertically) becomes better defined in the areas north and south of the road.

3. Provide any information available regarding the basis for the delineations that appear in the figures. Specifically, the target area for A2LF-3 does not include two of the sample locations that yielded exceedances of the lead background numbers used for evaluation. Did you sample for radionuclides?

Response: The pre-action contaminant delineations for these areas were for ISRA COCs, consistent with other areas included in the approved work plan. (Radionuclides are not an ISRA COC.) The response to Comment No. 2 addresses the two sample exceedance locations (A2BS1090 and A2BS1091). The proposed A2LF-3 excavation area is limited to the indicated drainage way segment that also exceeded the lead-based criteria.

The waste characterization results for A2LF-1 and A2LF-3 are provided as an attachment.

4. Include estimates of the amount of soil to be removed and the depth of excavation.

Response: The requested information was included on the referenced Figures 1 and 2. Also, please see the response to Comment No. 6.

5. Paragraph 4 of the email states that "The additional work will be conducted in 'general' accordance with the Health and Safety Plan, the Soil Management Plan, and the Transportation Plan that have been developed for implementation of the ISRA work." All of the work that is associated with the ISRA activities must be completed in full compliance with the approved plans. All deviations from those approved plans must be submitted for Regional Board and DISC approval prior to completion of the associated activity and the work must proceed in accordance with the approved modification.

Response: Comment acknowledged. Boeing will implement the actions in the 2 additional areas, in accordance with the referenced plans.

6. Include legends and preparation dates on all figures.

Response: Refer to the revised attached Figure D-5 and Figure D-6, for the A2LF-1 and A2LF-3 areas, respectively. These drawings also include the information referenced in Comment No. 4 above.

7. Include proposed re-grading details and tables of existing waste characterization data.

Response: NASA has not yet determined re-grading details for any of the ISRA excavation areas. Tabulations of the pre-excavation sample data for the ISRA COCs were referenced in, and included as an attachment with, the original NASA submittal.

Boeing has also completed additional surface soil sampling (that includes cesium 137) in these areas, for waste handling and disposal purposes. Attached are figures showing the sampling locations and the results of the radiological analyses (in the Waste Certification). However, tabulations of the other laboratory analytical data for these samples are not yet available from Boeing and will be provided to the Board as soon as they are received.

8. Identify adjacent soil borrow areas to be used post-excavation.

Response: As indicated above in Comment No.7, NASA has not yet decided on re-grading details for any of the ISRA excavation areas. If needed, areas of local borrow soil would be reviewed with the RWQCB prior to use.

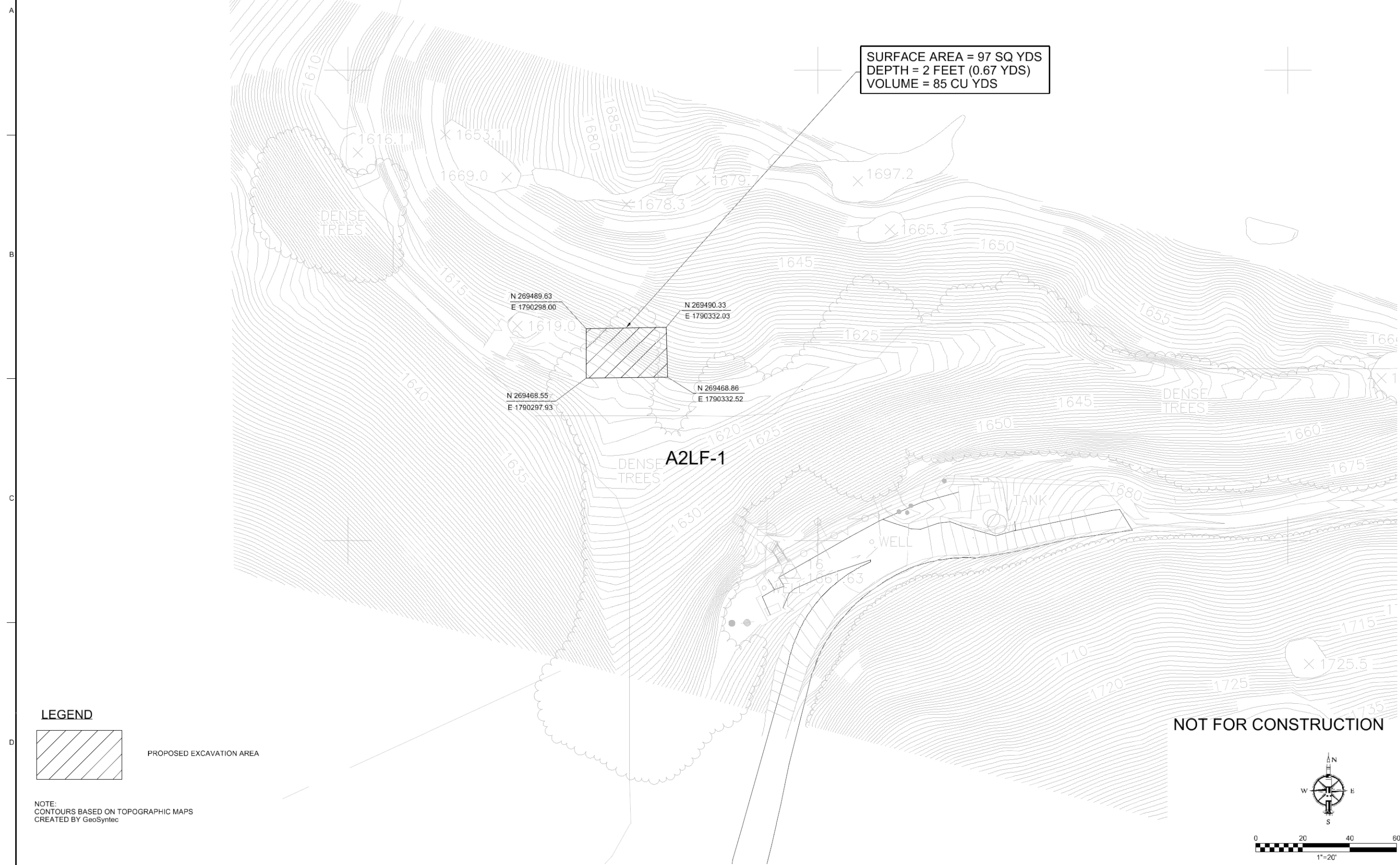
9. Include a signature of a responsible party.

Response: This has been included as part of the transmittal letter from Boeing.


Figures

EXCAVATION NOTE:
CONTRACTOR SHALL EXCAVATE AREAS INDICATED TO
2 FEET BGS OR BEDROCK WHICHEVER IS SHALLOWER.

SURFACE AREA = 97 SQ YDS
DEPTH = 2 FEET (0.67 YDS)
VOLUME = 85 CU YDS

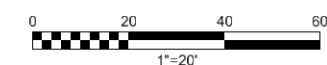
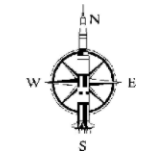


LEGEND

 PROPOSED EXCAVATION AREA

NOTE:
CONTOURS BASED ON TOPOGRAPHIC MAPS
CREATED BY GeoSynTec

NOT FOR CONSTRUCTION



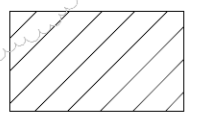
CH2MHILL		SANTA SUSANA FIELD LABORATORY VENTURA COUNTY, CA	
INTERM SOURCE REMOVAL ACTIONS OUTFALL 009 DRAINAGE AREAS		NASA HUNTSVILLE, AL	
EXCAVATION PLAN: A2LF-1			
DATE	07/02/09	NO.	DATE
PROJ	384727.01	NO.	DATE
DWG	D-5	NO.	DATE
SHEET		NO.	DATE
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING.		REVISION	
		CHK	
		DR	
		APVD	
		BY	
		APVD	

PRELIMINARY
REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL. © CH2M HILL 2009. ALL RIGHTS RESERVED.

EXCAVATION NOTE:
CONTRACTOR SHALL EXCAVATE AREAS INDICATED TO
2 FEET BGS OR BEDROCK WICHEVER IS SHALLOWER.

SURFACE AREA = 78 SQ YDS
DEPTH = 2 FEET (0.67 YDS)
VOLUME = 68 CU YDS

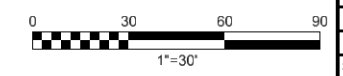
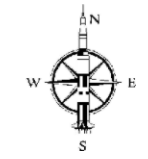
LEGEND



PROPOSED EXCAVATION AREA

NOTE:
CONTOURS BASED ON TOPOGRAPHIC MAPS
CREATED BY GeoSynlec

NOT FOR CONSTRUCTION



NO.	DATE	DR	CHK	APVD	BY	APVD

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA
NASA
HUNTSVILLE, AL






CH2MHILL
INTERM SOURCE REMOVAL ACTIONS
OUTFALL 009
DRAINAGE AREAS
EXCAVATION PLAN: A2LF-3

VERIFY SCALE	DATE	07/02/09
BAR IS ONE INCH ON ORIGINAL DRAWING.	PROJ	384727.01
0 1"	DWG	D-6
	SHEET	

PRELIMINARY
RE/USE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL. © CH2M HILL 2009. ALL RIGHTS RESERVED.

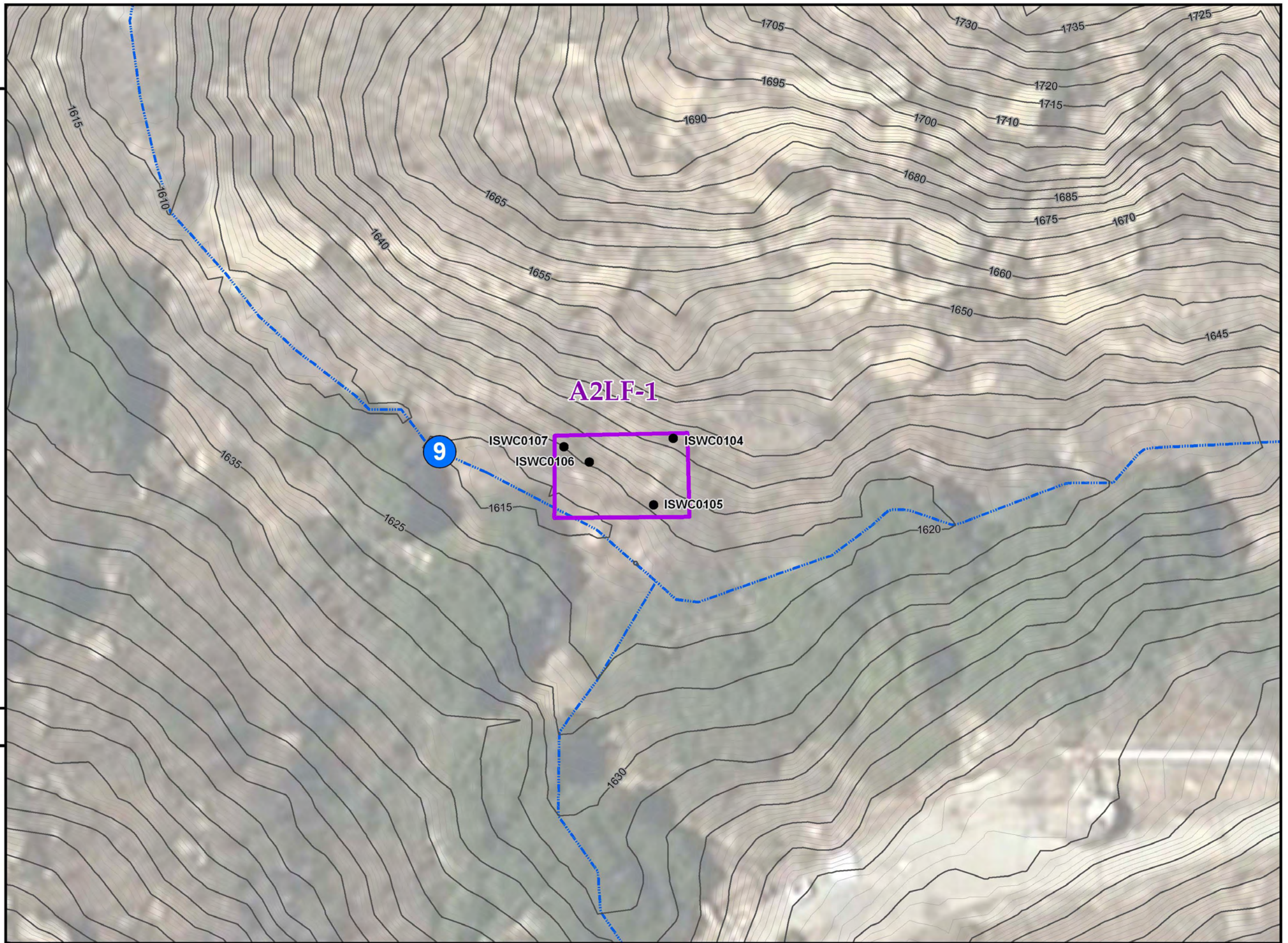
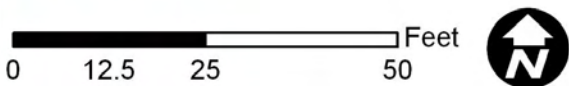
ISRA Excavation Area
Outfall 009
A2LF-1

Base Map Legend

-  Planned Excavation Area
-  Surface Water Drainage
-  NPDES Outfall
-  Elevation Contour
-  Waste Characterization Sample

Note:
 1. Topographic contours from LiDAR DEM, Airborne1 Corporation (2005).
 2. Aerial imagery from Google Earth (2007).








DRAFT Date: September 28, 2009



S A N T A S U S A N A F I E L D L A B O R A T O R Y

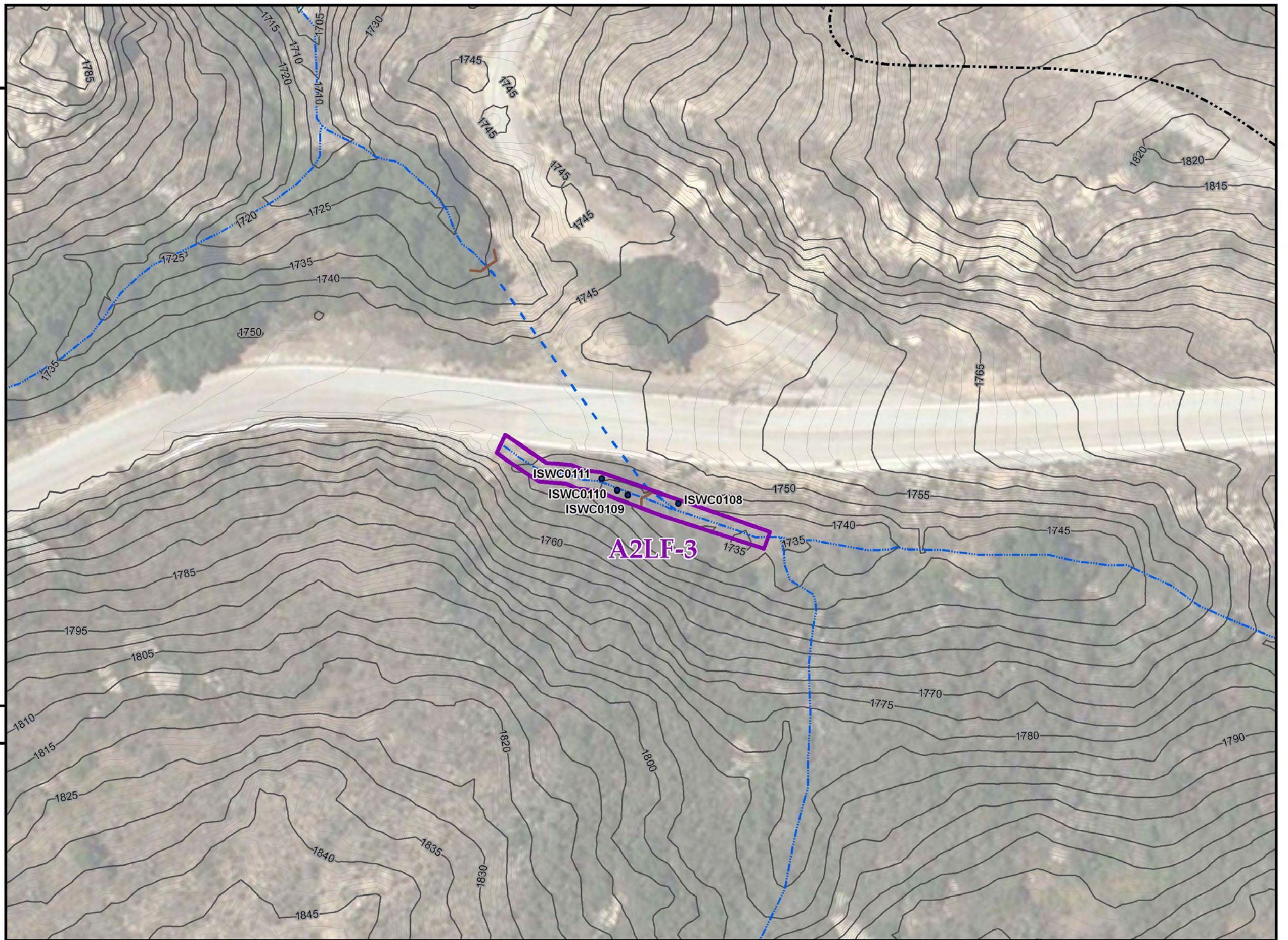
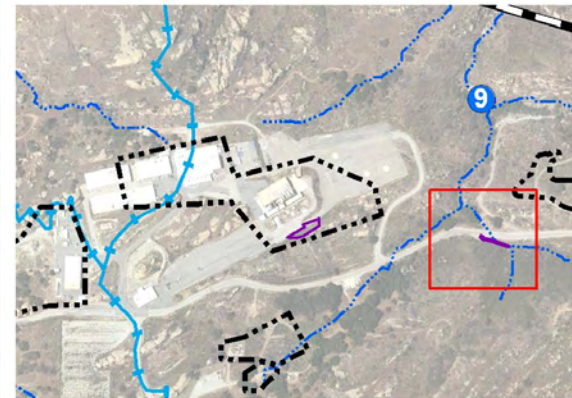
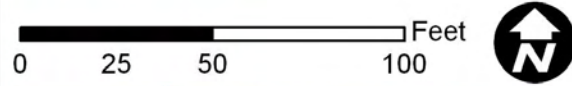
ISRA Excavation Area
Outfall 009
A2LF-3

Base Map Legend

-  RFI Site Boundary
-  Planned Excavation Area
-  Surface Water Drainage
-  Underground Drainage
-  Elevation Contour
-  Culverts
-  Waste Characterization Sample

Note:
 1. Topographic contours from LiDAR DEM, Airborne1 Corporation (2005).
 2. Aerial imagery from Google Earth (2007).

DRAFT Date: September 28, 2009



S A N T A S U S A N A F I E L D L A B O R A T O R Y

Waste Certification Report

**Area II Landfill Interim Source Removal Action (ISRA).
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of pre-excavation samples taken from the Area II Landfill Interim Source Removal Action (ISRA) area. This analysis and data interpretation complies with procedures approved by the California Department of Public Health¹.

Eight (8) samples taken for waste disposal characterization were analyzed for strontium-90, tritium and gamma emitting radionuclides by gamma spectroscopy, using an off-site laboratory. Minimum detectable activity (MDA) for cesium-137 and strontium-90 averaged ~0.044 pCi/g and ~0.040 pCi/g respectively. Minimum detectable activity for tritium averaged 0.82 pCi/g. The gamma spectroscopy library also included the following contaminants-of-concern: Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241. Laboratory data packages are available on request.

Statistical evaluation of sample analytical results to determine whether or not the sampled waste contains Cs-137 or Sr-90 activity elevated above local background was conducted using the Wilcoxon Rank Sum Test using protocols described in NUREG-1505² and DTSC guidance³ (See Appendix 1). Appendix 2 shows the complete analytical results for all radionuclides. Complete laboratory data packages are available on request.

Local background data for cesium-137 and strontium-90 was taken from Table 20 of the 1995 McLaren/Hart report⁴. Background for tritium in soil is not well established, and is not reported in the 1995 McLaren/Hart report, therefore tritium background in soil is conservatively assumed to be zero. Tritium data is therefore compared to the MDA of the analysis and the EPA preliminary remediation goal (PRG)⁵ for residential 10⁻⁶ risk.

¹ Boeing, "Northern Drainage Waste Sampling for Radionuclides." Revision 9, November 5, 2007. (Attachment 3 to Northern Drainage Work Plan) and "ISRA Waste Sampling for Radionuclides", Attachment A to the ISRA Soil Management Plan.

² NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998. http://www.philrutherford.com/Radiation_Cleanup_Standards/NUREG-1505.pdf

³ DTSC, "Selecting Inorganic Constituents as Chemicals of Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities." February 1997.

⁴ McLaren/Hart, "Additional Soil and Water Sampling at the Brandeis-Bardin Institute and Santa Monica Mountains Conservancy." Jan 19, 1995. <http://www.etec.energy.gov/Health-and-Safety/Documents/BrandeisBardin/AddSoilandWaterSamp.pdf>

⁵ EPA preliminary remediation goals for radionuclides - <http://epa-prgs.ornl.gov/radionuclides/>.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from the Area II Landfill ISRA area does not exceed the local background for Cs-137. The incremental dose from Cs-137 above background is therefore zero mrem/y. The highest Cs-137 result is 0.178 pCi/g which is less than the highest background result. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.125 mrem/y⁶.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from the Area II Landfill ISRA area does not exceed the local background for Sr-90. The incremental dose from Sr-90 above background is therefore zero mrem/y. The highest Sr-90 result is 0.029 pCi/g which is less than the highest background result. The highest non-background subtracted Sr-90 result is equivalent to an effective dose of 0.0089 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.31 pCi/g and the highest non-detect tritium result is -0.136 pCi/g. The highest non-detect, non-background subtracted tritium result is equivalent to an effective dose of 0.0 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any Class 1, 2 or 3 disposal facility. There are no radiological controls or restrictions imposed on future disposition or use of this soil.

This waste meets the requirements of disposal facility permits^{7,8} and complies with the California Health & Safety Code⁹.

The Governor’s Executive Order D-62-02 prohibits the “*disposal of decommissioned materials to Class III landfills or unclassified management units.*” The soil from the Area II Landfill ISRA area

⁶ EPA dose compliance concentrations for radionuclides - <http://epa-dccs.ornl.gov/>. Soil concentrations that meet the 10⁻⁶ residential risk PRG are < 0.1 mrem/y. The Cs-137 residential PRG of 0.0597 pCi/g is equivalent to 0.042 mrem/y. The Sr-90 residential PRG of 0.231 pCi/g is equivalent to 0.071 mrem/y. The tritium residential PRG of 2.28 pCi/g is equivalent to 0.032 mrem/y.

⁷ This waste is exempt from regulation and licensing or is expressly authorized for disposal under the Radiation Control Law (Division 104, Part 9, Chapter 5 of the California Health & Safety Code).

⁸ This waste is not prohibited from disposal by any government agency with jurisdictional authority over this waste.

⁹ Division 104, Part 9, Chapter 5, Article 1, Section 114715, “No person shall bury, throw away, or in any manner dispose of radioactive wastes within the state except in a manner and at locations as will result in no significant radioactive contamination of the environment.” For the purposes of this requirement, “significant” is defined in Section 114710 as amounts of radioactive materials that are likely to expose persons to ionizing radiation greater than the guide levels published by the Federal Radiation Council (FRC). The FRC no longer exists, but the applicable guide level last published by the FRC was 500 mrem per year to a member of the public. Because the regulatory dose limit to members of the public has since been lowered to 100 mrem per year, CDPH/RHB conservatively utilizes the lower dose for purposes of defining “significant” radioactive contamination in this Article of the California Health and Safety Code.
<http://www.leginfo.ca.gov/cgi-bin/displaycode?section=hsc&group=114001-115000&file=114705-114780>

is not decommissioned material, and does not originate from the proximity of any radiological facility. The sampling in this certification has therefore been conducted as a best management practice that also complies with the requirements of D-62-02. Verification sampling and/or approval by the California Department of Public Health (CDPH) Radiologic Health Branch (RHB) are not required for the off-site disposal of decommissioned material or of the subject material¹⁰.



Phil Rutherford
Manager, Health, Safety & Radiation Services

¹⁰ The California Department of Public Health (CDPH) Radiologic Health Branch (RHB) has stated in a November 9, 2007 email to Phil Rutherford (Boeing) ... *"The Governor's Executive Order D-62-02, does not specifically require the Department of Health Services (now the Department of Public Health) to perform verification sampling of decommissioned material or to provide approval for disposal of specific decommissioned material shipped offsite (e.g., to Class I or II landfills). The California DPH has not imposed a requirement that Boeing or the Department of Energy (DOE) seek DPH verification sampling or approval of all decommissioned material destined for Class I or II landfills in compliance with the Governor's Executive Order."*

Appendix 1

Wilcoxon Rank Sum Statistical Test for Cesium-137 and Strontium-90

Wilcoxon Rank Sum Test -- (Cesium-137)**General Information:**

The WRS tests whether or not measurements of samples from a survey area (S) tend to be consistently larger than those from a background reference area (R) by more than the DCGL.

The null hypothesis, H_0 , is: Survey sample concentrations exceed those in the background

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background

Instruction on how to use this template:

- 1) Enter analysis results in pCi/gram
- 2) Enter number of samples for background and survey data sets, m and n.
- 3) The WRS test is calculated using the method prescribed in NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

DCGL (pCi/g)	0.12
Type I Error Rate, Alpha:	0.05
Type II Error Rate, Beta:	0.05
Number of Background Samples, m:	51
Number of Survey Samples, n:	8
Z-value for Alpha	1.645
Critical Value	1604
Sum of Reference Ranks	1714

If the sum of the reference ranks is larger than the critical value, there is enough evidence to reject the null hypothesis and accept the alternative hypothesis. Otherwise the null hypothesis is accepted.

Test Result:

Survey sample concentrations do not exceed those in the background by more than the DCGL

	Bkgd Ref (R)	Survey (S)
Mean	0.087	0.090
Max	0.213	0.178
Min	0.015	-0.018
σ	0.062	0.069
$m-1.96\sigma$	-0.035	-0.046
$m+1.96\sigma$	0.210	0.225

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.217	R	36	36
2		0.020	0.145	R	14	14
3		0.020	0.145	R	14	14
4		0.100	0.225	R	40.5	40.5
5		0.020	0.145	R	14	14
6		0.158	0.283	R	51.5	51.5
7		0.175	0.300	R	53	53
8		0.209	0.334	R	58	58
9		0.180	0.305	R	54	54
10		0.030	0.155	R	22	22
11		0.213	0.338	R	59	59
12		0.025	0.150	R	19	19
13		0.020	0.145	R	14	14
14		0.020	0.145	R	14	14
15		0.074	0.199	R	32	32
16		0.147	0.272	R	47	47
17		0.100	0.225	R	40.5	40.5
18		0.067	0.192	R	30.5	30.5
19		0.099	0.224	R	39	39

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
20		0.101	0.226	R	42	42
21		0.148	0.273	R	48	48
22		0.153	0.278	R	50	50
23		0.025	0.150	R	19	19
24		0.188	0.313	R	55	55
25		0.198	0.323	R	57	57
26		0.030	0.155	R	22	22
27		0.079	0.204	R	33	33
28		0.158	0.283	R	51.5	51.5
29		0.109	0.234	R	43	43
30		0.059	0.184	R	29	29
31		0.067	0.192	R	30.5	30.5
32		0.113	0.238	R	44	44
33		0.015	0.140	R	9	9
34		0.031	0.156	R	24	24
35		0.042	0.167	R	27	27
36		0.097	0.222	R	37.5	37.5
37		0.015	0.140	R	9	9
38		0.020	0.145	R	14	14
39		0.085	0.210	R	35	35
40		0.080	0.205	R	34	34
41		0.015	0.140	R	9	9
42		0.020	0.145	R	14	14
43		0.035	0.160	R	25.5	25.5
44		0.035	0.160	R	25.5	25.5
45		0.025	0.150	R	19	19
46		0.150	0.275	R	49	49
47		0.140	0.265	R	45.5	45.5
48		0.190	0.315	R	56	56
49		0.097	0.222	R	37.5	37.5
50		0.030	0.155	R	22	22
51		0.140	0.265	R	45.5	45.5
52	ISWC0104RadS001	0.122	0.122	S	4	0
53	ISWC0105RadS001	0.123	0.123	S	5	0
54	ISWC0106RadS001	-0.018	-0.018	S	1	0
55	ISWC0107RadS001	0.025	0.025	S	3	0
56	ISWC0108RadS001	0.134	0.134	S	7	0
57	ISWC0109RadS001	0.128	0.128	S	6	0
58	ISWC0110RadS001	0.178	0.178	S	28	0
59	ISWC0111RadS001	0.024	0.024	S	2	0
Sum					1770	1714

Wilcoxon Rank Sum Test -- (Strontium-90)**General Information:**

The WRS tests whether or not measurements of samples from a survey area (S) tend to be consistently larger than those from a background reference area (R) by more than the DCGL.

The null hypothesis, H_0 , is: Survey sample concentrations exceed those in the background

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background

Instruction on how to use this template:

- 1) Enter analysis results in pCi/gram
- 2) Enter number of samples for background and survey data sets, m and n.
- 3) The WRS test is calculated using the method prescribed in NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

DCGL (pCi/g)	0.06
Type I Error Rate, Alpha:	0.05
Type II Error Rate, Beta:	0.05
Number of Background Samples, m:	51
Number of Survey Samples, n:	8
Z-value for Alpha	1.645
Critical Value	1604
Sum of Reference Ranks	1734

If the sum of the reference ranks is larger than the critical value, there is enough evidence to reject the null hypothesis and accept the alternative hypothesis. Otherwise the null hypothesis is accepted.

Test Result:

Survey sample concentrations do not exceed those in the background by more than the DCGL

	Bkgd Ref (R)	Survey (S)
Mean	0.051	0.013
Max	0.130	0.029
Min	0.005	0.004
σ	0.030	0.010
$m-1.96\sigma$	-0.008	-0.007
$m+1.96\sigma$	0.109	0.033

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.090	R	20	20
2		0.010	0.070	R	10.5	10.5
3		0.045	0.105	R	34.5	34.5
4		0.045	0.105	R	34.5	34.5
5		0.050	0.110	R	44	44
6		0.040	0.100	R	26	26
7		0.035	0.095	R	22.5	22.5
8		0.050	0.110	R	44	44
9		0.050	0.110	R	44	44
10		0.130	0.190	R	58.5	58.5
11		0.120	0.180	R	57	57
12		0.040	0.100	R	26	26
13		0.045	0.105	R	34.5	34.5
14		0.130	0.190	R	58.5	58.5
15		0.050	0.110	R	44	44
16		0.088	0.148	R	52	52
17		0.080	0.140	R	49	49
18		0.100	0.160	R	56	56
19		0.069	0.129	R	48	48
20		0.097	0.157	R	54	54
21		0.084	0.144	R	51	51

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
22		0.098	0.158	R	55	55
23		0.045	0.105	R	34.5	34.5
24		0.045	0.105	R	34.5	34.5
25		0.020	0.080	R	14	14
26		0.045	0.105	R	34.5	34.5
27		0.089	0.149	R	53	53
28		0.050	0.110	R	44	44
29		0.045	0.105	R	34.5	34.5
30		0.050	0.110	R	44	44
31		0.045	0.105	R	34.5	34.5
32		0.040	0.100	R	26	26
33		0.045	0.105	R	34.5	34.5
34		0.045	0.105	R	34.5	34.5
35		0.045	0.105	R	34.5	34.5
36		0.025	0.085	R	17.5	17.5
37		0.082	0.142	R	50	50
38		0.045	0.105	R	34.5	34.5
39		0.040	0.100	R	26	26
40		0.035	0.095	R	22.5	22.5
41		0.025	0.085	R	17.5	17.5
42		0.005	0.065	R	9	9
43		0.020	0.080	R	14	14
44		0.010	0.070	R	10.5	10.5
45		0.020	0.080	R	14	14
46		0.020	0.080	R	14	14
47		0.050	0.110	R	44	44
48		0.030	0.090	R	20	20
49		0.030	0.090	R	20	20
50		0.020	0.080	R	14	14
51		0.040	0.100	R	26	26
52	ISWC0104RadS001	0.008	0.008	S	5	0
53	ISWC0105RadS001	0.029	0.029	S	8	0
54	ISWC0106RadS001	0.027	0.027	S	7	0
55	ISWC0107RadS001	0.005	0.005	S	2	0
56	ISWC0108RadS001	0.017	0.017	S	6	0
57	ISWC0109RadS001	0.004	0.004	S	1	0
58	ISWC0110RadS001	0.007	0.007	S	4	0
59	ISWC0111RadS001	0.007	0.007	S	3	0
Sum					1770	1734

Soil Data from Area II Landfill ISRA

No.	Sample ID	Stockpile ID	Sampling Date	Laboratory Batch	Cesium-137 (pCi/g)				Strontium-90 (pCi/g)				Tritium (pCi/g)			
					Activity	+/- 2σ Error	MDA	Non-detect?	Activity	+/- 2σ Error	MDA	Non-detect?	Activity	+/- 2σ Error	MDA	Non-detect?
1	ISWC0104RadS001	N/A	9/3/2009	236678	0.122	0.0529	0.0437		0.00767	0.0224	0.0415	NDA	-0.136	0.51	0.915	NDA
2	ISWC0105RadS001	N/A	9/3/2009	236678	0.123	0.0418	0.0459		0.0287	0.0245	0.0393	NDA	-0.486	0.486	0.909	NDA
3	ISWC0106RadS001	N/A	9/3/2009	236678	-0.0176	0.0223	0.0368	NDA	0.0273	0.0272	0.0443	NDA	-0.365	0.493	0.908	NDA
4	ISWC0107RadS001	N/A	9/3/2009	236678	0.0254	0.0233	0.042	NDA	0.00488	0.0207	0.0398	NDA	-0.368	0.498	0.917	NDA
5	ISWC0108RadS001	N/A	9/3/2009	236678	0.134	0.0496	0.0536		0.0172	0.0223	0.0381	NDA	-0.222	0.517	0.934	NDA
6	ISWC0109RadS001	N/A	9/3/2009	236678	0.128	0.0389	0.0373		0.00413	0.021	0.0405	NDA	-0.411	0.499	0.922	NDA
7	ISWC0110RadS001	N/A	9/3/2009	236678	0.178	0.0445	0.0465		0.00741	0.0162	0.0295	NDA	-0.325	0.497	0.91	NDA
8	ISWC0111RadS001	N/A	9/3/2009	236678	0.0244	0.0243	0.0449	NDA	0.00713	0.0234	0.0443	NDA	-0.165	0.516	0.927	NDA

	Cesium-137 (pCi/g)				Strontium-90 (pCi/g)				Tritium (pCi/g)			
	Activity		MDA	Non-detect?	Activity		MDA	Non-detect?	Activity		MDA	Non-detect?
Average	0.090		0.044		0.013		0.040		-0.310		0.918	
Maximum	0.178		0.054		0.029		0.044		-0.136		0.934	
Minimum	-0.018		0.037		0.004		0.030		-0.486		0.908	
Count				8				8				8
Number of Non-Detects				3				8				8
% Non-Detects				38%				100%				100%

Appendix 2
Analytical Radionuclide Results

ISRA Soil Sample Results for Area II Landfill

Project Name	Sampling Organization	Sampling Date	Sampling Location (General)	Sampling Location (Specific)	Sample Serial Number	Media Type	Isotope	Value	Error (+/-)	MDA	Non-Detect?	Units	Error Type	Analysis Protocol	Analysis Organization	Document	Status
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Americium-241	-0.0227	0.182	0.336	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Americium-241	0.0143	0.118	0.203	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Americium-241	-0.00775	0.128	0.239	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Americium-241	-0.0246	0.0843	0.144	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Americium-241	0.048	0.0399	0.0699	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Americium-241	0.137	0.11	0.183	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Americium-241	0.0921	0.106	0.173	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Americium-241	0.0779	0.112	0.187	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Cesium-134	0	0.0483	0.0636	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Cesium-134	0	0.0425	0.061	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Cesium-134	0	0.0311	0.0556	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Cesium-134	0	0.0451	0.0531	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Cesium-134	0.0442	0.0366	0.0673	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Cesium-134	0.0383	0.0374	0.0531	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Cesium-134	0	0.0413	0.0616	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Cesium-134	0	0.0296	0.0572	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Cesium-137	0.122	0.0529	0.0437	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Cesium-137	0.123	0.0418	0.0459	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Cesium-137	-0.0176	0.0223	0.0368	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Cesium-137	0.0254	0.0233	0.042	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Cesium-137	0.134	0.0496	0.0536	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Cesium-137	0.128	0.0389	0.0373	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Cesium-137	0.178	0.0445	0.0465	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Cesium-137	0.0244	0.0243	0.0449	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Cobalt-60	-0.0118	0.0242	0.0384	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Cobalt-60	0.00764	0.0259	0.0448	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Cobalt-60	0.0118	0.0242	0.043	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Cobalt-60	0.000442	0.0236	0.0401	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Cobalt-60	0.00422	0.0301	0.0519	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Cobalt-60	-0.0123	0.0248	0.0397	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Cobalt-60	0.0181	0.0226	0.0411	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Cobalt-60	-0.00352	0.0241	0.041	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Europium-152	0.024	0.0994	0.123	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Europium-152	-0.0542	0.0719	0.0981	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Europium-152	-0.0644	0.061	0.0886	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Europium-152	-0.0671	0.0547	0.0882	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Europium-152	0.0286	0.0795	0.123	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Europium-152	-0.0016	0.0634	0.0971	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Europium-152	-0.0339	0.0836	0.11	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Europium-152	-0.0347	0.0682	0.102	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Europium-154	-0.0829	0.0862	0.133	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Europium-154	-0.0272	0.0794	0.132	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Europium-154	-0.0598	0.0695	0.112	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Europium-154	-0.0816	0.0776	0.12	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Europium-154	0.0163	0.0975	0.169	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Europium-154	0.0131	0.0697	0.119	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Europium-154	-0.0692	0.0695	0.109	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Europium-154	-0.0589	0.0734	0.119	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Lead-214	1.07	0.136	0.0868	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Lead-214	1.13	0.144	0.0748	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Lead-214	0.916	0.113	0.0695	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Lead-214	0.918	0.106	0.0721	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Lead-214	0.981	0.12	0.0708	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Manganese-54	-0.00929	0.0253	0.043	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Manganese-54	-0.00354	0.0239	0.0403	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Manganese-54	-0.00153	0.0208	0.0357	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Manganese-54	-0.0271	0.0231	0.0366	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Manganese-54	0.0429	0.0292	0.054	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Manganese-54	0.00149	0.0228	0.0396	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Manganese-54	0.00378	0.0235	0.04	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Manganese-54	0.00084	0.0234	0.0405	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Potassium-40	22.4	1.99	0.376	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Potassium-40	22.3	1.94	0.368	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Potassium-40	23.4	2.23	0.294	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Potassium-40	21.8	1.82	0.267	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial

ISRA Soil Sample Results for Area II Landfill

Project Name	Sampling Organization	Sampling Date	Sampling Location (General)	Sampling Location (Specific)	Sample Serial Number	Media Type	Isotope	Value	Error (+/-)	MDA	Non-Detect?	Units	Error Type	Analysis Protocol	Analysis Organization	Document	Status
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Potassium-40	21.6	1.68	0.388		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Potassium-40	22	2.07	0.315		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Potassium-40	22	1.91	0.328		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Potassium-40	21	1.8	0.345		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Sodium-22	-0.03	0.0307	0.0474	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Sodium-22	-0.0099	0.0283	0.0468	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Sodium-22	-0.0291	0.0253	0.0397	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Sodium-22	-0.0294	0.0276	0.0428	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Sodium-22	0.00484	0.0347	0.0601	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Sodium-22	0.0045	0.0248	0.0422	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Sodium-22	-0.0266	0.0249	0.0388	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Sodium-22	-0.0202	0.0262	0.0426	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Strontium-90	0.00767	0.0224	0.0415	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Strontium-90	0.0287	0.0245	0.0393	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Strontium-90	0.0273	0.0272	0.0443	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Strontium-90	0.00488	0.0207	0.0398	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Strontium-90	0.0172	0.0223	0.0381	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Strontium-90	0.00413	0.021	0.0405	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Strontium-90	0.00741	0.0162	0.0295	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Strontium-90	0.00713	0.0234	0.0443	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Thorium-228	1.53	0.147	0.0692		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Thorium-228	1.53	0.16	0.0599		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Thorium-228	1.47	0.127	0.0527		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Thorium-228	1.4	0.117	0.0516		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Thorium-228	1.45	0.151	0.0628		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Thorium-228	1.38	0.114	0.0548		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Thorium-228	1.41	0.124	0.0638		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Thorium-228	1.37	0.121	0.0598		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Thorium-232	1.55	0.259	0.147		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Thorium-232	1.6	0.27	0.138		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Thorium-232	1.58	0.277	0.12		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Thorium-232	1.35	0.234	0.125		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Thorium-232	1.37	0.248	0.168		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Thorium-232	1.29	0.226	0.135		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Thorium-232	1.64	0.268	0.143		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Thorium-232	1.41	0.232	0.115		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Tritium	-0.136	0.51	0.915	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Tritium	-0.486	0.486	0.909	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Tritium	-0.365	0.493	0.908	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Tritium	-0.368	0.498	0.917	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Tritium	-0.222	0.517	0.934	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Tritium	-0.411	0.499	0.922	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Tritium	-0.325	0.497	0.91	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Tritium	-0.165	0.516	0.927	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Uranium-235	0.103	0.153	0.275	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Uranium-235	-0.106	0.141	0.233	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Uranium-235	0.0594	0.126	0.217	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Uranium-235	0.0255	0.12	0.206	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Uranium-235	0.252	0.195	0.229		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Uranium-235	0.0801	0.142	0.241	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Uranium-235	0.126	0.165	0.244	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Uranium-235	0.0967	0.175	0.227	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0104	ISWC0104RadS001	Soil	Uranium-238	-1.17	1.44	2.51	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0105	ISWC0105RadS001	Soil	Uranium-238	1.52	1.58	1.6	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0106	ISWC0106RadS001	Soil	Uranium-238	0.215	1.04	1.88	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0107	ISWC0107RadS001	Soil	Uranium-238	1.34	1.17	1.28		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0108	ISWC0108RadS001	Soil	Uranium-238	0.777	0.727	0.685		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0109	ISWC0109RadS001	Soil	Uranium-238	1.06	0.885	1.48	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0110	ISWC0110RadS001	Soil	Uranium-238	2.96	1.61	1.43		pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial
ISRA Waste Characterization	MWH	9/3/2009	A2LF	ISWC0111	ISWC0111RadS001	Soil	Uranium-238	1.24	1.29	1.52	NDA	pCi/g	2 sigma	EML HASL 300, 4.5.2.3	GEL	236678	Pre-remedial

Waste Characterization Reports

A2LF-1

A2LF-3

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA AREA II PLANNED EXCAVATION A2LF-1

Introduction

This report presents supporting detailed information for the September 3, 2009 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area II.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area II in accordance with the ISRA Workplan was performed. A step-by-step approach was followed to accomplish characterization of the soil prior to excavation. The first step was to review available information regarding historical area usage and existing analytical data from past soil sampling in the applicable SSFL Area II locations. The objective was to identify all substances that could have an impact on the determination of whether soil in each planned excavation footprint was hazardous or not.

The next step was to develop a random sampling plan for each of the planned excavation footprints to determine whether any of the identified substances are present at concentrations that require further investigation. An evaluation of the results of the initial random sampling was performed to determine whether the data was adequate for waste characterization based on the exhibited variance of any detected analytes and the relative difference between detected concentrations and regulatory thresholds. The soil was characterized non-hazardous when analyte concentrations among the samples exhibited a reasonably small variance and there was satisfactory margin between the mean of the samples and applicable regulatory thresholds. Otherwise, additional samples were collected and subjected to analysis or the soil was characterized as hazardous.

The review of historical information and existing analytical data relevant to planned excavation A2LF-1 was based largely on the Group 2 RFI results. Evaluation of these data and other sources of relevant information suggested that Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOC), Regulated metals, Polychlorinated Biphenyls (PCB), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the A2LF-1 excavation footprint. A random sampling plan was developed for collection of Four (4) samples from the planned excavation footprint, taking into account the relatively small area to be excavated. The samples were analyzed for TPH, VOC, CAM 17 metals, PCBs, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the A2LF-1 planned excavation area are presented in TestAmerica report ISI0508 issued on 9/25/09. TPH in the C10 - C40 range was detected in all of the samples. Concentrations were low, with a maximum of 54 mg/kg. No Petroleum Hydrocarbons in the C6 - C12 range (gasoline) were detected. A trace concentration of Acetone was detected at 0.015 mg/kg, possibly a lab artifact. No other VOCs were detected. No SVOCs were detected, and no PCBs were detected.

Low concentrations of some regulated metals were detected. Chromium was detected at concentrations ranging from 17 mg/kg to 23 mg/kg. Lead was detected at concentrations

ranging from 2.6 mg/kg to 13 mg/kg. These and all other detected regulated metals were well below regulatory thresholds.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area II A2LF-1:

Is Not a Listed Waste (generator knowledge)

Is Not ignitable (generator knowledge)

Is Not corrosive (generator knowledge)

Is Not reactive (generator knowledge)

Is Not toxic (analytical results and generator knowledge)

Is Not Extremely or Acutely Hazardous Waste

Does not exceed any RCRA or Title 22 thresholds

Is Not subject to the Prop. 65 listing

Is Not subject to Title 22 Appendix X list

Is Not known by experience or testing to pose a hazard to human health or environment because of its carcinogenicity, acute toxicity, chronic toxicity, bio-accumulative properties, or persistence in the environment.

The soil in A2LF-1 is NON-HAZARDOUS.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	ISWC0104	ISWC0105	ISWC0106	ISWC0107
				Sample Name:	ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
				Collection Date:	9/3/2009	9/3/2009	9/3/2009	9/3/2009
				Sample Depth (feet):	0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT	RESULT	RESULT	RESULT
METALS								
Antimony	mg/kg	500	150	--	<10	<10	<10	<10
Arsenic	mg/kg	500	50	100	4.2	4.8	4.2	4.4
Barium	mg/kg	10,000	1,000	2,000	88	84	61	70
Beryllium	mg/kg	75	7.5	--	0.64	0.64	0.58	0.57
Cadmium	mg/kg	100	10	20	<0.50	<0.50	<0.50	<0.50
Chromium	mg/kg	500	50	100	23	23	18	18
Cobalt	mg/kg	8,000	800	--	5.8	5.9	4.8	5.1
Copper	mg/kg	2,500	250	--	9.5	8.8	6.9	9.2
Lead	mg/kg	1,000	50	100	13	4.5	2.6	5.9
Mercury	mg/kg	20	2	4	0.015 J	0.012 J	0.0067 J	0.013 J
Molybdenum	mg/kg	3,500	3,500	--	<2.0	<2.0	<2.0	<2.0
Nickel	mg/kg	2,000	200	--	18	17	14	14
Selenium	mg/kg	100	10	20	<2.0	<2.0	<2.0	<2.0
Silver	mg/kg	500	50	100	<1.0	<1.0	<1.0	<1.0
Thallium	mg/kg	700	70	--	<10	<10	<10	<10
Vanadium	mg/kg	2,400	240	--	38	38	30	32
Zinc	mg/kg	5,000	2,500	--	62	54	43	50
TPH								
Volatile Fuel Hydrocarbons (C6-C12)	mg/kg	--	--	--	0.014	0.011	0.010	0.015
TPH DRO (C10-C24)	mg/kg	--	--	--	15	<5.0	<5.0	10
TPH EFH (C10-C40)	mg/kg	--	--	--	54	22	14	48
TPH ORO (C25-C40)	mg/kg	--	--	--	39	18	9.7	38
PCBs								
Aroclor 1016	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1221	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1232	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1242	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1248	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1254	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1260	ug/kg	50,000	50,000	--	<50	<50	<50	<50
VOCs								
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	<2.0	<2.0	<2.0 I	<1.9
1,1,1-Trichloroethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I
1,1,2-Trichloroethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	ISWC0104	ISWC0105	ISWC0106	ISWC0107
					Sample Name:	ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
					Collection Date:	9/3/2009	9/3/2009	9/3/2009	9/3/2009
					Sample Depth (feet):	0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT	RESULT	RESULT	RESULT	
1,1-Dichloroethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
1,1-Dichloroethene	ug/kg	--	--	14,000	<2.0	<2.0	<2.0	<1.9	
1,1-Dichloropropene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
1,2,3-Trichlorobenzene	ug/kg	--	--	--	<2.0 C, I, M2, R-3	<2.0 I	<2.0 I	<1.9 I	
1,2,3-Trichloropropane	ug/kg	--	--	--	<2.0 I, M1	<2.0 I	<2.0 I	<1.9 I	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<2.0 I, M2	<2.0 I	<2.0 I	<1.9 I	
1,2,4-Trimethylbenzene	ug/kg	--	--	--	<0.99 I, M1, R-3	<0.98 I	<0.99 I	<0.97 I	
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	<9.9 I	<9.8 I	<9.9 I	<9.7 I	
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97	
1,2-Dichlorobenzene	ug/kg	--	--	--	<0.99 I	<0.98 I	<0.99 I	<0.97 I	
1,2-Dichloroethane	ug/kg	--	--	10,000	<0.99	<0.98	<0.99	<0.97	
1,2-Dichloropropane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
1,3,5-Trimethylbenzene	ug/kg	--	--	--	<0.99 I, M1	<0.98 I	<0.99 I	<0.97 I	
1,3-Dichlorobenzene	ug/kg	--	--	--	<0.99 C, I	<0.98 I	<0.99 I	<0.97 I	
1,3-Dichloropropane	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97	
1,4-Dichlorobenzene	ug/kg	--	--	--	<0.99 I	<0.98 I	<0.99 I	<0.97 I	
2,2-Dichloropropane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
2-Butanone (MEK)	ug/kg	--	--	4,000,000	<9.9	<9.8	<9.9	<9.7	
2-Chlorotoluene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I	
2-Hexanone	ug/kg	--	--	--	<9.9	<9.8	<9.9 I	<9.7	
4-Chlorotoluene	ug/kg	--	--	--	<2.0 I, M1	<2.0 I	<2.0 I	<1.9 I	
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	<5.0	<4.9	<4.9	<4.9	
Acetone	ug/kg	--	--	--	<9.9	<9.8	<9.9	15	
Benzene	ug/kg	--	--	10,000	<0.99	<0.98	<0.99	<0.97	
Bromobenzene	ug/kg	--	--	--	<2.0 I, M1, R-3	<2.0 I	<2.0 I	<1.9 I	
Bromochloromethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9	
Bromodichloromethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
Bromoform	ug/kg	--	--	--	<2.0	<2.0	<2.0 I	<1.9	
Bromomethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9	
Carbon Disulfide	ug/kg	--	--	--	<5.0	<4.9	<4.9	<4.9	
Carbon tetrachloride	ug/kg	--	--	10,000	<2.0	<2.0	<2.0	<1.9	
Chlorobenzene	ug/kg	--	--	2,000,000	<0.99	<0.98	<0.99 I	<0.97	
Chloroethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9	
Chloroform	ug/kg	--	--	120,000	<0.99	<0.98	<0.99	<0.97	
Chloromethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9	
cis-1,2-Dichloroethene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	ISWC0104	ISWC0105	ISWC0106	ISWC0107
					Sample Name:	ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
					Collection Date:	9/3/2009	9/3/2009	9/3/2009	9/3/2009
					Sample Depth (feet):	0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT	RESULT	RESULT	RESULT	
cis-1,3-Dichloropropene	ug/kg	--	--	--	<0.99	<0.98 L	<0.99 L	<0.97 L	
Dibromochloromethane	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97	
Dibromomethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
Dichlorodifluoromethane	ug/kg	--	--	--	<5.0	<4.9	<4.9	<4.9	
Ethylbenzene	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97	
Hexachlorobutadiene	ug/kg	--	--	--	<2.0 C, I	<2.0 I	<2.0 I	<1.9 I	
Isopropylbenzene	ug/kg	--	--	--	<0.99 I, M1	<0.98 I	<0.99 I	<0.97 I	
m,p-Xylenes	ug/kg	--	--	--	<2.0	<2.0	<2.0 I	<1.9	
Methylene chloride	ug/kg	--	--	--	<9.9	<9.8	<9.9	<9.7	
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9	
Naphthalene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I	
n-Butylbenzene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I	
n-Propylbenzene	ug/kg	--	--	--	<0.99 I, M1	<0.98 I	<0.99 I	<0.97 I	
o-Xylene	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97	
p-Isopropyltoluene	ug/kg	--	--	--	<0.99 C, I	<0.98 I	<0.99 I	<0.97 I	
sec-Butylbenzene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I	
Styrene	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97	
tert-Butylbenzene	ug/kg	--	--	--	<2.0 C, I, M1, R-3	<2.0 I	<2.0 I	<1.9 I	
Tetrachloroethene	ug/kg	--	--	14,000	<0.99	<0.98	<0.99 I	<0.97	
Toluene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
trans-1,2-Dichloroethene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
trans-1,3-Dichloropropene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97	
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	<0.99	<0.98	<0.99	<0.97	
Trichlorofluoromethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9	
Vinyl acetate	ug/kg	--	--	--	<5.0 M2	<4.9	<4.9	<4.9	
Vinyl chloride	ug/kg	--	--	4,000	<2.0	<2.0	<2.0	<1.9	
SVOCs									
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<330	<330	<330	<330	
1,2-Dichlorobenzene	ug/kg	--	--	--	<330	<330	<330	<330	
1,2-Diphenylhydrazine/Azobenzene	ug/kg	--	--	--	<330	<330	<330	<330	
1,3-Dichlorobenzene	ug/kg	--	--	--	<330	<330	<330	<330	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	<330	<330	<330	<330	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	<330	<330	<330	<330	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	<330	<330	<330	<330	
2,4-Dichlorophenol	ug/kg	--	--	--	<330	<330	<330	<330	
2,4-Dimethylphenol	ug/kg	--	--	--	<330	<330	<330	<330	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	ISWC0104	ISWC0105	ISWC0106	ISWC0107
				Sample Name:	ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
				Collection Date:	9/3/2009	9/3/2009	9/3/2009	9/3/2009
				Sample Depth (feet):	0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT	RESULT	RESULT	RESULT
2,4-Dinitrophenol	ug/kg	--	--	--	<660	<660	<660	<660
2,4-Dinitrotoluene	ug/kg	--	--	2,600	<330	<330	<330	<330
2,6-Dinitrotoluene	ug/kg	--	--	--	<330	<330	<330	<330
2-Chloronaphthalene	ug/kg	--	--	--	<330	<330	<330	<330
2-Chlorophenol	ug/kg	--	--	--	<330	<330	<330	<330
2-Methylnaphthalene	ug/kg	--	--	--	<330	<330	<330	<330
2-Methylphenol	ug/kg	--	--	--	<330	<330	<330	<330
2-Nitroaniline	ug/kg	--	--	--	<330	<330	<330	<330
2-Nitrophenol	ug/kg	--	--	--	<330	<330	<330	<330
3,3'-Dichlorobenzidine	ug/kg	--	--	--	<830	<830	<830	<830
3-Nitroaniline	ug/kg	--	--	--	<330	<330	<330	<330
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	<420	<420	<420	<420
4-Bromophenyl phenyl ether	ug/kg	--	--	--	<330	<330	<330	<330
4-Chloro-3-methylphenol	ug/kg	--	--	--	<330	<330	<330	<330
4-Chloroaniline	ug/kg	--	--	--	<330	<330	<330	<330
4-Chlorophenyl phenyl ether	ug/kg	--	--	--	<330	<330	<330	<330
4-Methylphenol	ug/kg	--	--	--	<330 L	<330 L	<330 L	<330 L
4-Nitroaniline	ug/kg	--	--	--	<830	<830	<830	<830
4-Nitrophenol	ug/kg	--	--	--	<830	<830	<830	<830
Acenaphthene	ug/kg	--	--	--	<330	<330	<330	<330
Acenaphthylene	ug/kg	--	--	--	<330	<330	<330	<330
Aniline	ug/kg	--	--	--	<420	<420	<420	<420
Anthracene	ug/kg	--	--	--	<330	<330	<330	<330
Benzidine	ug/kg	--	--	--	<660	<660	<660	<660
Benzo(a)anthracene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(a)pyrene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(b)fluoranthene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(g,h,i)perylene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(k)fluoranthene	ug/kg	--	--	--	<330	<330	<330	<330
Benzoic acid	ug/kg	--	--	--	<830	<830	<830	<830
Benzyl alcohol	ug/kg	--	--	--	<330	<330	<330	<330
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	<330	<330	<330	<330
Bis(2-chloroethyl)ether	ug/kg	--	--	--	<170	<170	<170	<170
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	<330	<330	<330	<330
Bis(2-ethylhexyl)phthalate	ug/kg	--	--	--	<330	<330	<330	<330
Butyl benzyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	ISWC0104	ISWC0105	ISWC0106	ISWC0107
					Sample Name:	ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
					Collection Date:	9/3/2009	9/3/2009	9/3/2009	9/3/2009
					Sample Depth (feet):	0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT	RESULT	RESULT	RESULT	
Chrysene	ug/kg	--	--	--	<330	<330	<330	<330	
Dibenz(a,h)anthracene	ug/kg	--	--	--	<420	<420	<420	<420	
Dibenzofuran	ug/kg	--	--	--	<330	<330	<330	<330	
Diethyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330	
Dimethyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330	
Di-n-butyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330	
Di-n-octyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330	
Fluoranthene	ug/kg	--	--	--	<330	<330	<330	<330	
Fluorene	ug/kg	--	--	--	<330	<330	<330	<330	
Hexachlorobenzene	ug/kg	--	--	2,600	<330	<330	<330	<330	
Hexachlorobutadiene	ug/kg	--	--	10,000	<330	<330	<330	<330	
Hexachlorocyclopentadiene	ug/kg	--	--	--	<830	<830	<830	<830	
Hexachloroethane	ug/kg	--	--	60,000	<330	<330	<330	<330	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	<330	<330	<330	<330	
Isophorone	ug/kg	--	--	--	<330	<330	<330	<330	
Naphthalene	ug/kg	--	--	--	<330	<330	<330	<330	
Nitrobenzene	ug/kg	--	--	40,000	<330	<330	<330	<330	
N-Nitrosodimethylamine	ug/kg	--	--	--	<330	<330	<330	<330	
N-Nitroso-di-n-propylamine	ug/kg	--	--	--	<250	<250	<250	<250	
N-Nitrosodiphenylamine	ug/kg	--	--	--	<330	<330	<330	<330	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	<830	<830	<830	<830	
Phenanthrene	ug/kg	--	--	--	<330	<330	<330	<330	
Phenol	ug/kg	--	--	--	<330	<330	<330	<330	
Pyrene	ug/kg	--	--	--	<330	<330	<330	<330	
RADIONUCLIDES	--	--	--	--	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

¹ - WET Leachate Testing Trigger = STLC limit * 10

² - TCLP Leachate Testing Trigger = TCLP limit * 20

I - Internal Standard recovery was outside of method limits. Matrix interference was confirmed.

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

L - Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

M2 - The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

M7 - The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).

µg/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

R - Radiological analysis includes gamma spectroscopy (Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241), strontium-90, and tritium. Boeing has prepared a document dated September 21, 2009 that provides the radiological results and statistical analysis of the Outfall 009 A2LF waste characterization samples. Based on the results, the document certifies the soil represented by these waste characterization samples to be "radiologically" acceptable for shipment to Class 1, 2, and/or 3 disposal facilities. The analysis and data interpretation complies with procedures approved by the California Department of Public Health.

R-3 - The RPD exceeded the acceptance limit due to sample matrix effects

RL1 - Reporting limit raised due to sample matrix effects.

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA AREA II PLANNED EXCAVATION A2LF-3

Introduction

This report presents supporting detailed information for the September 3, 2009 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area II.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area II in accordance with the ISRA Workplan was performed. A step-by-step approach was followed to accomplish characterization of the soil prior to excavation. The first step was to review available information regarding historical area usage and existing analytical data from past soil sampling in the applicable SSFL Area II locations. The objective was to identify all substances that could have an impact on the determination of whether soil in each planned excavation footprint was hazardous or not.

The next step was to develop a random sampling plan for each of the planned excavation footprints to determine whether any of the identified substances are present at concentrations that require further investigation. An evaluation of the results of the initial random sampling was performed to determine whether the data was adequate for waste characterization based on the exhibited variance of any detected analytes and the relative difference between detected concentrations and regulatory thresholds. The soil was characterized non-hazardous when analyte concentrations among the samples exhibited a reasonably small variance and there was satisfactory margin between the mean of the samples and applicable regulatory thresholds. Otherwise, additional samples were collected and subjected to analysis or the soil was characterized as hazardous.

The review of historical information and existing analytical data relevant to planned excavation A2LF-3 was based largely on the Group 2 RFI results. Evaluation of these data and other sources of relevant information suggested that Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOC), Regulated metals, Polychlorinated Biphenyls (PCB), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the A2LF-3 excavation footprint. A random sampling plan was developed for collection of Four (4) samples from the planned excavation footprint, taking into account the relatively small area to be excavated. The samples were analyzed for TPH, VOC, CAM 17 metals, PCBs, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the A2LF-3 planned excavation area are presented in TestAmerica report ISI0508 issued on 9/25/09. TPH in the C10 - C40 range was detected in all of the samples. Concentrations were low, with a maximum of 150 mg/kg. No Petroleum Hydrocarbons in the C6 - C12 range (gasoline) were detected. A trace concentration of Acetone was detected at 0.009 mg/kg, as well as Toluene at a concentration of 0.0008 mg/kg. No other VOCs were detected. SVOCs were detected, but all were below an individual and collective concentration of 1 mg/kg in any given sample. No PCBs were detected.

Regulated metals were detected, and in one case exceeded the California STLC 10 X rule requiring the performance of the WET leachate test. Chromium was detected at concentrations

ranging from 17 mg/kg to 27 mg/kg. Lead was detected at concentrations ranging from 27 mg/kg to 74 mg/kg. The required California WET for Lead was conducted on the sample that exceeded the total Lead 50 ppm threshold and resulted in a leachate concentration of 3.7 mg/L. Although this is below the California STLC hazardous waste threshold, other factors were also of importance in characterizing this soil. The Lead detections were not tightly grouped. Consequently, a large variance, and the proximity of the mean concentration to the regulatory threshold, indicated that additional sampling was needed before analytical results could be considered representative of the average soil characteristics.

All other detected regulated metals were well below regulatory thresholds.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area II A2LF-3:

Is Not a Listed Waste (generator knowledge)

Is Not ignitable (generator knowledge)

Is Not corrosive (generator knowledge)

Is Not reactive (generator knowledge)

Is potentially toxic (analytical results and generator knowledge)

Is Not Extremely or Acutely Hazardous Waste

May exceed the Title 22 threshold for Lead

Is Not subject to the Prop. 65 listing

Is Not subject to Title 22 Appendix X list

Is Not known by experience or testing to pose a hazard to human health or environment because of its carcinogenicity, acute toxicity, chronic toxicity, bio-accumulative properties, or persistence in the environment.

The soil in A2LF-3 will be managed as HAZARDOUS in lieu of additional sampling.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-3 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			ISWC0108	ISWC0109	ISWC0110	ISWC0111
			Sample Name:			ISWC0108S001	ISWC0109S001	ISWC0110S001	ISWC0111S001
			Collection Date:			9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):			0.5 - 1.0	0.0 - 0.2	0.0 - 0.2	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT	RESULT	RESULT	RESULT
METALS									
Antimony	mg/kg	500	150	--	--	<10	<10	<10	<10
Arsenic	mg/kg	500	50	100	--	7.0	5.4	5.7	4.7
Barium	mg/kg	10,000	1,000	2,000	--	91	78	90	68
Beryllium	mg/kg	75	7.5	--	--	0.74	0.69	0.61	0.56
Cadmium	mg/kg	100	10	20	--	<0.50	<0.50	<0.50	<0.50
Chromium	mg/kg	500	50	100	--	27	20	19	17
Cobalt	mg/kg	8,000	800	--	--	6.4	5.4	5.2	4.6
Copper	mg/kg	2,500	250	--	--	12	10	10	8.1
Lead	mg/kg	1,000	50	100	--	44	27	30	74
Lead, WET	mg/L	--	--	--	5	--	--	--	3.7
Mercury	mg/kg	20	2	4	--	0.020 J	0.034	0.028 J	0.015 J
Molybdenum	mg/kg	3,500	3,500	--	--	<2.0	<2.0	<2.0	<2.0
Nickel	mg/kg	2,000	200	--	--	18	14	14	12
Selenium	mg/kg	100	10	20	--	<2.0	<2.0	<2.0	<2.0
Silver	mg/kg	500	50	100	--	<1.0	<1.0	<1.0	<1.0
Thallium	mg/kg	700	70	--	--	<10	<10	<10	<10
Vanadium	mg/kg	2,400	240	--	--	41	36	34	32
Zinc	mg/kg	5,000	2,500	--	--	70	58	61	53
TPH									
Volatile Fuel Hydrocarbons (C6-C12)	mg/kg	--	--	--	--	0.012	0.013	0.014	0.053
TPH DRO (C10-C24)	mg/kg	--	--	--	--	9.3	34	22	27
TPH EFH (C10-C40)	mg/kg	--	--	--	--	46	150	120	120 M1
TPH ORO (C25-C40)	mg/kg	--	--	--	--	36	120	100	93
PCBs									
Aroclor 1016	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
Aroclor 1221	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
Aroclor 1232	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
Aroclor 1242	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
Aroclor 1248	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
Aroclor 1254	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
Aroclor 1260	ug/kg	50,000	50,000	--	--	<50	<50	<50	<50
VOCs									
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	--	<1.9	<2.0 I	<4.0 RL1	<2.0
1,1,1-Trichloroethane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	--	<1.9 I	<2.0 I	<4.0 RL1, I	<2.0

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-3 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			ISWC0108	ISWC0109	ISWC0110	ISWC0111
			Sample Name:			ISWC0108S001	ISWC0109S001	ISWC0110S001	ISWC0111S001
			Collection Date:			9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):			0.5 - 1.0	0.0 - 0.2	0.0 - 0.2	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT	RESULT	RESULT	RESULT
1,1,2-Trichloroethane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
1,1-Dichloroethane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
1,1-Dichloroethene	ug/kg	--	--	14,000	--	<1.9	<2.0	<4.0 RL1	<2.0
1,1-Dichloropropene	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
1,2,3-Trichlorobenzene	ug/kg	--	--	--	--	<1.9 l	<2.0 l	<4.0 RL1, l	<2.0
1,2,3-Trichloropropane	ug/kg	--	--	--	--	<1.9 l	<2.0 l	<4.0 RL1, l	<2.0 M1
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<1.9 l	<2.0 l	<4.0 RL1, l	<2.0
1,2,4-Trimethylbenzene	ug/kg	--	--	--	--	<0.97 l	<1.0 l	<2.0 RL1, l	<0.99
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	--	<9.7 l	<10 l	<20 RL1, l	<9.9
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	--	<0.97	<1.0 l	<2.0 RL1	<0.99
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<0.97 l	<1.0 l	<2.0 RL1, l	<0.99
1,2-Dichloroethane	ug/kg	--	--	10,000	--	<0.97	<1.0	<2.0 RL1	<0.99
1,2-Dichloropropane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
1,3,5-Trimethylbenzene	ug/kg	--	--	--	--	<0.97 l	<1.0 l	<2.0 RL1, l	<0.99
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<0.97 l	<1.0 l	<2.0 RL1, l	<0.99
1,3-Dichloropropane	ug/kg	--	--	--	--	<0.97	<1.0 l	<2.0 RL1	<0.99
1,4-Dichlorobenzene	ug/kg	--	--	--	--	<0.97 l	<1.0 l	<2.0 RL1, l	<0.99
2,2-Dichloropropane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
2-Butanone (MEK)	ug/kg	--	--	4,000,000	--	<9.7	<10	<20 RL1	<9.9
2-Chlorotoluene	ug/kg	--	--	--	--	<1.9 l	<2.0 l	<4.0 RL1, l	<2.0
2-Hexanone	ug/kg	--	--	--	--	<9.7	<10 l	<20 RL1	<9.9
4-Chlorotoluene	ug/kg	--	--	--	--	<1.9 l	<2.0 l	<4.0 RL1, l	<2.0
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	--	<4.8	<5.0	<10 RL1	<4.9
Acetone	ug/kg	--	--	--	--	<9.7	<10	<20 RL1	<9.9 M1, R-3
Benzene	ug/kg	--	--	10,000	--	<0.97	<1.0	<2.0 RL1	<0.99
Bromobenzene	ug/kg	--	--	--	--	<1.9 l	<2.0 l	<4.0 RL1, l	<2.0
Bromochloromethane	ug/kg	--	--	--	--	<1.9	<2.0	<4.0 RL1	<2.0
Bromodichloromethane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
Bromoform	ug/kg	--	--	--	--	<1.9	<2.0 l	<4.0 RL1	<2.0
Bromomethane	ug/kg	--	--	--	--	<1.9	<2.0	<4.0 RL1	<2.0
Carbon Disulfide	ug/kg	--	--	--	--	<4.8	<5.0	<10 RL1	<4.9
Carbon tetrachloride	ug/kg	--	--	10,000	--	<1.9	<2.0	<4.0 RL1	<2.0
Chlorobenzene	ug/kg	--	--	2,000,000	--	<0.97	<1.0 l	<2.0 RL1	<0.99
Chloroethane	ug/kg	--	--	--	--	<1.9	<2.0	<4.0 RL1	<2.0
Chloroform	ug/kg	--	--	120,000	--	<0.97	<1.0	<2.0 RL1	<0.99
Chloromethane	ug/kg	--	--	--	--	<1.9	<2.0	<4.0 RL1	<2.0

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-3 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			ISWC0108	ISWC0109	ISWC0110	ISWC0111
			Sample Name:			ISWC0108S001	ISWC0109S001	ISWC0110S001	ISWC0111S001
			Collection Date:			9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):			0.5 - 1.0	0.0 - 0.2	0.0 - 0.2	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT	RESULT	RESULT	RESULT
cis-1,2-Dichloroethene	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
cis-1,3-Dichloropropene	ug/kg	--	--	--	--	<0.97 L	<1.0 L	<2.0 RL1, L	<0.99 L, M7
Dibromochloromethane	ug/kg	--	--	--	--	<0.97	<1.0 I	<2.0 RL1	<0.99
Dibromomethane	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
Dichlorodifluoromethane	ug/kg	--	--	--	--	<4.8	<5.0	<10 RL1	<4.9
Ethylbenzene	ug/kg	--	--	--	--	<0.97	<1.0 I	<2.0 RL1	<0.99
Hexachlorobutadiene	ug/kg	--	--	--	--	<1.9 I	<2.0 I	<4.0 RL1, I	<2.0
Isopropylbenzene	ug/kg	--	--	--	--	<0.97 I	<1.0 I	<2.0 RL1, I	<0.99
m,p-Xylenes	ug/kg	--	--	--	--	<1.9	<2.0 I	<4.0 RL1	<2.0
Methylene chloride	ug/kg	--	--	--	--	<9.7	<10	<20 RL1	<9.9
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	--	<1.9	<2.0	<4.0 RL1	<2.0
Naphthalene	ug/kg	--	--	--	--	<1.9 I	<2.0 I	<4.9 I	<2.0
n-Butylbenzene	ug/kg	--	--	--	--	<1.9 I	<2.0 I	<4.0 RL1, I	<2.0
n-Propylbenzene	ug/kg	--	--	--	--	<0.97 I	<1.0 I	<2.0 RL1, I	<0.99
o-Xylene	ug/kg	--	--	--	--	<0.97	<1.0 I	<2.0 RL1	<0.99
p-Isopropyltoluene	ug/kg	--	--	--	--	<0.97 I	<1.0 I	<2.0 RL1, I	<0.99
sec-Butylbenzene	ug/kg	--	--	--	--	<1.9 I	<2.0 I	<4.0 RL1, I	<2.0
Styrene	ug/kg	--	--	--	--	<0.97	<1.0 I	<2.0 RL1	<0.99
tert-Butylbenzene	ug/kg	--	--	--	--	<1.9 I	<2.0 I	<4.0 RL1, I	<2.0
Tetrachloroethene	ug/kg	--	--	14,000	--	<0.97	<1.0 I	<2.0 RL1	<0.99
Toluene	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
trans-1,2-Dichloroethene	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
trans-1,3-Dichloropropene	ug/kg	--	--	--	--	<0.97	<1.0	<2.0 RL1	<0.99
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	--	<0.97	<1.0	<2.0 RL1	<0.99
Trichlorofluoromethane	ug/kg	--	--	--	--	<1.9	<2.0	<4.0 RL1	<2.0
Vinyl acetate	ug/kg	--	--	--	--	<4.8	<5.0	<10 RL1	<4.9 M2
Vinyl chloride	ug/kg	--	--	4,000	--	<1.9	<2.0	<4.0 RL1	<2.0
SVOCs									
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<330	<330	<330	<330
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<330	<330	<330	<330
1,2-Diphenylhydrazine/Azobenzene	ug/kg	--	--	--	--	<330	<330	<330	<330
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<330	<330	<330	<330
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<330	<330	<330	<330
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<330	<330	<330	<330
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<330	<330	<330	<330
2,4-Dichlorophenol	ug/kg	--	--	--	--	<330	<330	<330	<330

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-3 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			ISWC0108	ISWC0109	ISWC0110	ISWC0111
			Sample Name:			ISWC0108S001	ISWC0109S001	ISWC0110S001	ISWC0111S001
			Collection Date:			9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):			0.5 - 1.0	0.0 - 0.2	0.0 - 0.2	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT	RESULT	RESULT	RESULT
2,4-Dimethylphenol	ug/kg	--	--	--	--	<330	<330	<330	<330
2,4-Dinitrophenol	ug/kg	--	--	--	--	<660	<660	<660	<660
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<330	<330	<330	<330
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<330	<330	<330	<330
2-Chloronaphthalene	ug/kg	--	--	--	--	<330	<330	<330	<330
2-Chlorophenol	ug/kg	--	--	--	--	<330	<330	<330	<330
2-Methylnaphthalene	ug/kg	--	--	--	--	<330	<330	<330	<330
2-Methylphenol	ug/kg	--	--	--	--	<330	<330	<330	<330
2-Nitroaniline	ug/kg	--	--	--	--	<330	<330	<330	<330
2-Nitrophenol	ug/kg	--	--	--	--	<330	<330	<330	<330
3,3'-Dichlorobenzidine	ug/kg	--	--	--	--	<830	<830	<830	<830
3-Nitroaniline	ug/kg	--	--	--	--	<330	<330	<330	<330
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<420	<420	<420	<420
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<330	<330	<330	<330
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<330	<330	<330	<330
4-Chloroaniline	ug/kg	--	--	--	--	<330	<330	<330	<330
4-Chlorophenyl phenyl ether	ug/kg	--	--	--	--	<330	<330	<330	<330
4-Methylphenol	ug/kg	--	--	--	--	<330 L	<330	<330 L	<330 L
4-Nitroaniline	ug/kg	--	--	--	--	<830	<830	<830	<830
4-Nitrophenol	ug/kg	--	--	--	--	<830	<830	<830	<830
Acenaphthene	ug/kg	--	--	--	--	<330	<330	<330	<330
Acenaphthylene	ug/kg	--	--	--	--	<330	<330	<330	<330
Aniline	ug/kg	--	--	--	--	<420	<420	<420	<420
Anthracene	ug/kg	--	--	--	--	<330	<330	<330	<330
Benzidine	ug/kg	--	--	--	--	<660	<660	<660	<660
Benzo(a)anthracene	ug/kg	--	--	--	--	<330	<330	<330	<330
Benzo(a)pyrene	ug/kg	--	--	--	--	<330	<330	<330	<330
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<330	<330	<330	<330
Benzo(g,h,i)perylene	ug/kg	--	--	--	--	<330	<330	<330	<330
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<330	<330	<330	<330
Benzoic acid	ug/kg	--	--	--	--	<830	<830	<830	<830
Benzyl alcohol	ug/kg	--	--	--	--	<330	<330	<330	<330
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<330	<330	<330	<330
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<170	<170	<170	<170
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<330	<330	<330	<330
Bis(2-ethylhexyl)phthalate	ug/kg	--	--	--	--	430	<330	<330	<330

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-3 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:				ISWC0108	ISWC0109	ISWC0110	ISWC0111
			Sample Name:				ISWC0108S001	ISWC0109S001	ISWC0110S001	ISWC0111S001
			Collection Date:				9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):				0.5 - 1.0	0.0 - 0.2	0.0 - 0.2	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT	RESULT	RESULT	RESULT	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<330	<330	<330	<330	
Chrysene	ug/kg	--	--	--	--	<330	<330	<330	<330	
Dibenz(a,h)anthracene	ug/kg	--	--	--	--	<420	<420	<420	<420	
Dibenzofuran	ug/kg	--	--	--	--	<330	<330	<330	<330	
Diethyl phthalate	ug/kg	--	--	--	--	<330	<330	<330	<330	
Dimethyl phthalate	ug/kg	--	--	--	--	<330	<330	<330	<330	
Di-n-butyl phthalate	ug/kg	--	--	--	--	<330	<330	<330	<330	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<330	<330	<330	<330	
Fluoranthene	ug/kg	--	--	--	--	<330	<330	<330	<330	
Fluorene	ug/kg	--	--	--	--	<330	<330	<330	<330	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<330	<330	<330	<330	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<330	<330	<330	<330	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<830	<830	<830	<830	
Hexachloroethane	ug/kg	--	--	60,000	--	<330	<330	<330	<330	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<330	<330	<330	<330	
Isophorone	ug/kg	--	--	--	--	<330	<330	<330	<330	
Naphthalene	ug/kg	--	--	--	--	<330	<330	<330	<330	
Nitrobenzene	ug/kg	--	--	40,000	--	<330	<330	<330	<330	
N-Nitrosodimethylamine	ug/kg	--	--	--	--	<330	<330	<330	<330	
N-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<250	<250	<250	<250	
N-Nitrosodiphenylamine	ug/kg	--	--	--	--	<330	<330	<330	<330	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<830	<830	<830	<830	
Phenanthrene	ug/kg	--	--	--	--	<330	<330	<330	<330	
Phenol	ug/kg	--	--	--	--	<330	<330	<330	<330	
Pyrene	ug/kg	--	--	--	--	<330	<330	<330	<330	
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**A2LF-3 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

¹ - WET Leachate Testing Trigger = STLC limit * 10

² - TCLP Leachate Testing Trigger = TCLP limit * 20

I - Internal Standard recovery was outside of method limits. Matrix interference was confirmed.

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

L - Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

M2 - The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

M7 - The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).

µg/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

R - Radiological analysis includes gamma spectroscopy (Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241), strontium-90, and tritium. Boeing has prepared a document dated September 21, 2009 that provides the radiological results and statistical analysis of the Outfall 009 A2LF waste characterization samples. Based on the results, the document certifies the soil represented by these waste characterization samples to be "radiologically" acceptable for shipment to Class 1, 2, and/or 3 disposal facilities. The analysis and data interpretation complies with procedures approved by the California Department of Public Health.

R-3 - The RPD exceeded the acceptance limit due to sample matrix effects

RL1 - Reporting limit raised due to sample matrix effects.